March 2024

Organisation of Eastern Caribbean States

OHCP GRADE 3 MATHEMATICS

Overview of the Grade 3 OHPC

The standards at the grade 3 level are designed considering the preceding grades. In light of this, teachers again emphasize the importance of ensuring students' proficiency in prerequisites before introducing new concepts or skills. The expected outcomes in terms of knowledge, skills, values, and mathematical processes for Grade 3 are outlined within six content strands: Number Sense (N), Operation with numbers (O), Patterns and relationships(P), Geometric Thinking (G), Measurement(M) and Data Handling (D). This section further offers guidance on the recommended activities that teachers should employ to facilitate students' mastery of content within these strands.

- In Operations and Pattern Relationships, students grasp multiplication and division meanings using equal-sized groups, arrays, and area models. They employ operation properties to calculate whole number products, comparing strategies to understand the relationship between multiplication and division.
- In Number Sense and Operations—Fractions, students understand unit fractions, view fractions as built from unit fractions, and use visual models to represent equal parts of a whole. They comprehend that the size of a fractional part is relative to the size of the whole, using fractions to represent numbers greater than, less than, or equal to one and solving fraction comparison problems.
- In Measurement and Data, students recognize perimeter and area as two-dimensional region attributes. They measure area by counting same-size units, with a square of unit length as the standard. Students understand decomposing rectangular arrays, connecting the area to multiplication, and justifying the use of multiplication for rectangle areas.
- In Geometry, students classify polygons based on sides and vertices. They link fraction work to geometry, expressing part of a shape's area as a unit fraction of the whole.

While not all standards are explicitly outlined in this summary, all standards are expected to be incorporated into the instruction.

Introduction to the Subject:
Number Sense is an important skill in Mathematics. Learners are expected to develop it gradually over time as they are provided opportunities to explore and play with numbers. As learners' experiences are nurtured, they will further understand numbers and show improvement in Mental Mathematics performance. Moreover, as they are exposed to the strategies within this Essential Learning Outcome, learners are expected to better understand numbers (good number sense) as opportunities are given to visualize numbers in various contexts, identify relationships, and predict patterns.

Strand (Topic): Number Sense

Essential Learning Outcomes:

- Whole Number – Saying Number Sequence, Meaningful Counting and Skip Counting

Grade Level Expectations and/or Focus Questions:

- Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones, e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Count by 1s within 1000; Skip-count by 2s, 5s, 10s, and 100s to 1000 using any starting point.

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr>
<td>
Key Skills: counting in sequence, skip counting forward and backward)

Learners will be expected to:

<u>Knowledge:</u>
1. Identify the digits within a three-digit number.
2. Identify the place value of the digits in a three-digit number, e.g. hundreds, tens, ones.
3. Say number sequence by 1s, 2s, 5s, 10s, and 100s forward, backward, and by any given number up to 1000.

<u>Skills:</u>
4. Count by 1s, 2s, 5s, 10s, and 100s forward and backward up to 1000.
5. Skip count from any given point using multiples of 2, 5, 10 and 100.
6. Model skip counting by 2s, 5s, 10s, and 100s using number lines and games.

<u>Values:</u>
7. Create and solve situations involving skip counting by 2s, 5s, 10s, and 100s.
</td>
<td>
Product: Game
Provide learners with number cards and listen as they identify the digits. Learners will have the cards face down, select a card, and then read the digits after they find a card with similar digits written on it.

Think – Pair – Share
Allow learners to work in pairs. Using the place value charts, learners place digits accordingly and indicate the place value by saying or writing. Observe and listen as partners choose the numbers and discuss the place values for the digits.

OR

Observation
Learners can be provided with individual Place Value charts and a set of numbers to identify and record the Place Value.

Observational Checklist:
<table>
<tr><td rowspan="2">Number</td><td colspan="2">Behaviour: Can identify place value</td><td rowspan="2">Comments</td></tr>
<tr><td></td><td></td></tr>
<tr><td>362</td><td></td><td></td><td></td></tr>
</table>
Product: Game
</td>
<td>
Provide learners with opportunities to read numbers and identify the digits in the numbers. For example: Pick a card from a bowl/ bag which contains a number and say the digits in the number.

Allow learners to provide the Place Value for the digits identified in a given number. Provide learners with pocket charts labelled with the Place Values. Learners use the charts to place the digits of a number and state the place values.

Use soft balls or bean bags and allow learners to count by a given number aloud. As learners catch the ball or bean bag, they must say the following number in the sequence.

Give learners opportunities to complete a number sequence by counting forward, backward and from any given starting point.
For example:
<table>
<tr><td>100</td><td></td><td>130</td><td>140</td><td></td><td></td></tr>
</table>
If I make 4 hops on the blocks from 140, I will be at _____

Can you tell which number comes next?
<table>
<tr><td>385</td><td>380</td><td>375</td><td>____
_</td><td>365</td><td>360</td></tr>
</table>
</td>
</tr>
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Allow learners to form small groups of four or five students. Each group is given a ball/bean bag and a number sequence to count by. Listen and observe learners as they count out. Listen for fluency and accuracy. (Note: This can be done with individual learners) **Product: Exit Cards** Distribute skip counting cards, which learners will complete individually. For example: 620 622 624 _____ 628 628 625 626 **Observation:** Provide learners with open and closed number lines, pictorial or concrete. Observe as they demonstrate counting. **Observation:** Provide learners with materials such as counters, sticks, or other materials to build sets to model skip counting by 2s, 5s, and 10s. Product: Provide learners with situations or allow learners to create situations or stories and allow them to listen as the teacher or peers read. Learners can be provided with materials to assist with solutions.	Allow learners to describe the rule in determining the terms in the sequence. Use number lines and number cards and allow learners to insert the numbers as they count forward or backward or from any given point. (image) Provide learners with opportunities to identify errors and omissions in counting or given sequence/ Encourage learners to use counters or illustrations to depict quantities while skip counting by twos, fives, and tens. Examples include items like marbles, sticks, 10-cent coins, and 5-cent coins. Allow learners to use materials such as cutouts or make handprints and cut them out. Learners label the hands and take turns to skip count by 5s. Use stories or problems that emphasize number sequences for 2s, 5s, and 10s from different points in the sequence. An example of a storybook that can be used.  **Eggs and Legs: Counting by Twos (Know Your Numbers)** by Michael Dahl (shelved 1 time as *skip-counting*) For example: May buys 10 pencils each day. How many pencils will she have by Thursday?

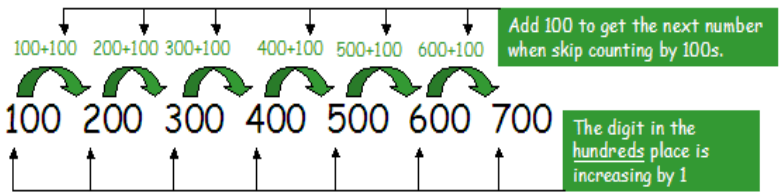
Useful Content Knowledge:

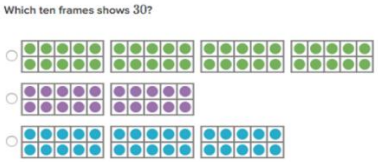
As students in Grade 3 begin to expand their experiences with numbers to 1000, it is important that teachers provide experiences that will help them combat difficulties that they may experience with the increase of numbers. Students should be given opportunities to explore numbers beyond 100 to 1000 so that they can recognize that there is a pattern within our number system which helps us to predict numbers, e.g. 198, 199, 200, 201, 202, 203, 204, 205 etc., or 505, 510, 515, 520, 525, etc.

Teachers should also engage students in activities that require them to:

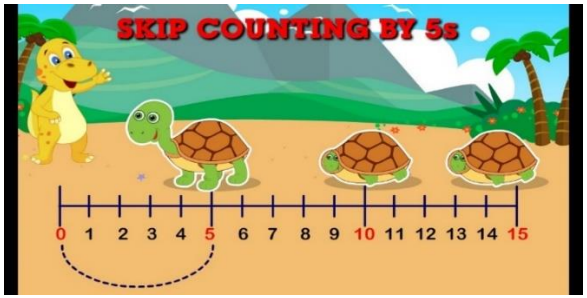
- recognize and explain errors and omissions in a given skip-counting sequence. This will help to reinforce the development of counting, number relationships, and place value. When skip-counting with students, the focus should be on looking for patterns.

- count on and count back by 5s, 10s, and 100s are important mental math strategies for addition and subtraction.
  Images below were retrieved from https://www.didax.com/rekenrek-demonstration-bead-string-to-100.html.



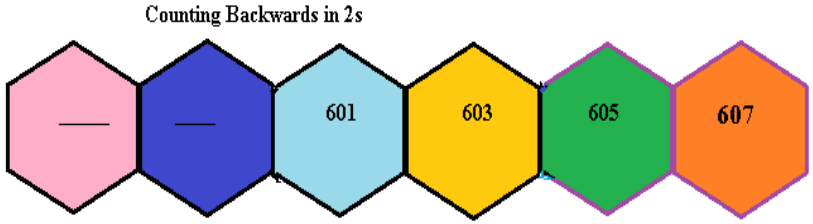


Using the beaded number line learners can count in 5s or 10s

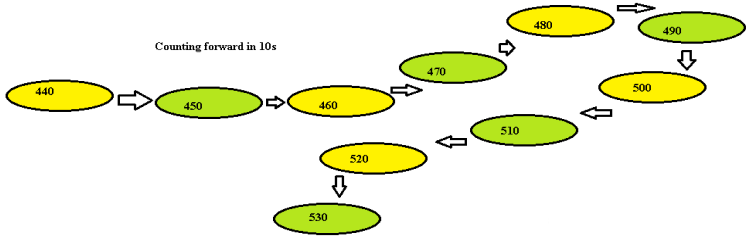


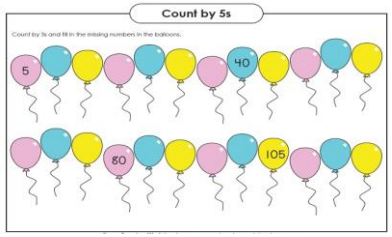
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

If Cindy continue to add 5 to 95 ten more times what will be her result?



For skip counting retrieved from https://www.alamy.com/stock-photo-variety-of-eastern-caribbean-dollar-coins-in-various-cent-denominations-32842377.html





Retrieved from https://www.snappyjack.co.uk/set-of-french-counting-balloons and https://www.mathswithmum.com/skip-counting-by-10/.

Additional Useful Content Knowledge for the Teacher:

As students in Grade 3 begin to expand their experiences with numbers to 1000, teachers must provide experiences that will help them combat difficulties that they may experience with the increase of numbers. Students should be given opportunities to explore numbers beyond 100 to 1000 so that they can recognize that there is a pattern within our number system which helps us to predict numbers, e.g. 198, 199, 200, 201, 202, 203, 204, 205 etc., or 505, 510, 515, 520, 525, etc.

Teachers should also engage students in activities that require them to:

8. recognize and explain errors and omissions in a given skip-counting sequence. This will help to reinforce the development of counting, number relationships, and place value. When skip-counting with students, the focus should be on looking for patterns.

Teachers should provide experiences and opportunities for learners to recognize the pattern with the number system. The pattern helps in predicting numbers.
The focus of skip counting is looking for number patterns. Reinforce the development of counting, number relationships and place value.
Counting on and backward are Mental Mathematics strategies for addition and subtraction.
Use various materials, both in concrete and pictorial forms, to explore numbers, e.g. Number lines, Five and Ten frames and Money - coins/notes.

Opportunities for Subject Integration:

Mathematics: All topics require counting
Money: Counting amounts, Making combinations
Data Handling: Representing data - Tally marks for the tally charts, numbers for labelling the axis.

Language Arts:
Writing: Learners can write brief descriptions of numbers, including names and place values.
Comprehension: Use clues and allow learners to read and make inferences/ draw conclusions based on the clues to determine the answer.

Social Studies:

(Data Handling)

General Science:
Body Systems: Skeletal System: Number of bones in the body
Body Parts: Fingers/Toes - five on one hand/foot, ten in all; some parts come in pairs - nostrils, eyes, ears, hands, legs, breasts.

Arts and Crafts: Draw shapes and pictures to use for skip counting and for representing numbers.

Strategies that Support the Curriculum and Assessment Framework

This section is optional and intended to assist writers in checking the curriculum to the Curriculum and Assessment Framework. It can be used at the discretion of the Team Leads and PICT Subject Specialists. It will be used to guide the writing but will not appear in the curriculum guides.

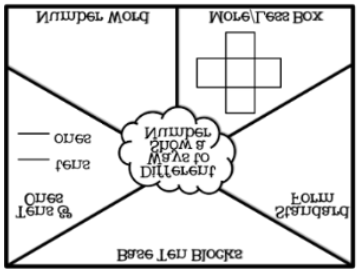
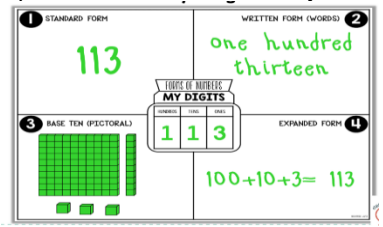
Elements that are integrated across subjects:

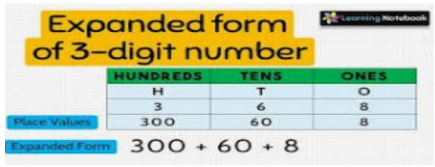
Elements from Local Culture, Technology, TVET, and Environment that are integrated:

Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

Number Sense and Pattern and Relationship ELO N1.2

Introduction to the Subject:
Strand (Topic): Number Sense
Essential Learning Outcomes: - Whole Number - Whole Number – Representing and Partitioning Quantities
Grade Level Expectations and/or Focus Questions: - Read, represent, compose, and decompose whole numbers up to and including 1000, using various tools and strategies (concretely, pictorially, and symbolically), and describe various ways they are used in everyday life.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Key Skills: counting in sequence, skip counting forward and backward) Learners will be expected to: **<u>Knowledge</u>** - Read and write numbers up to 1000 in figures and words. **<u>Skills</u>** - Express a three-digit number in different ways e.g. Word form: two hundred and six Standard form: 203 Place value: 2 hundreds, 3 ones. Concretely using base ten blocks Pictorially - Express three-digit numbers up to 1000 in expanded form - Estimate the values of expanded notation for numbers up to 1000. **<u>Values</u>** - Recognise the use and importance of three-digit numbers in everyday living (real situations)	**Product:** Have the learners complete simple information cards, such as forms, that allow them to write numbers in various forms. FORM Date of Birth: _____ / _____ / _____ Age: Observe learners using the template to represent any three-digit number they choose in at least 5 different ways. E.g. 	Allow opportunities for learners to use numbers in everyday situations. For example, they can tell the year they were born, the cost of bus fare to a nearby town, the time school begins, or the area code for their country. Provide learners with experiences to read and write numbers up to 1000 in figures and words. For example, using number cards with matching pairs. Give learners opportunities to represent numbers up to 1000 in various ways. For example:  (Google image) Allow learners to represent/model numbers using base ten blocks, counters, drawings, tallies, or other materials. Give learners opportunities to expand three–digit numbers up to 1000 in different ways, which will help them understand each digit's values and representations.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Product: Game Allow learners to use number cards which contain numbers in words and figures. Learners can take turns choosing a card and reading the corresponding numbers, and the pair with the matching number will also indicate the match and read the number. Learners work in groups where they roll three dice together, and using the values that are rolled out, they will read and write the numbers formed. **Observation:** Provide learners with templates that they can use to represent any three–digit number. Observe learners as they use and complete the template for various numbers. For example: (insert image) **Product: Puzzle (Game)** Prepare a puzzle (Tarsia puzzle) where numbers are expanded and presented in various forms. Learners must match the cords correctly to complete the puzzle. With Tarsia puzzles, matching the puzzle pieces correctly reveals a unique shape. Learners can complete the puzzle individually or in groups. They can be observed as they complete. **Product: Game**	For example: 547 = 5 hundreds + 4 tens + 7 ones = 500 + 40 + 7 = (5 × 100) + (4 × 10) + (7 × 1) Provide experiences for learners to use various materials to create three–digit numbers. For example, learners can use dice, number cards, and base ten blocks to write numbers for expanding.   (Google images) Provide learners with opportunities to use stories and situations to make estimates. For example: 1. Sara has 175 plums. Sam has 50 more than her. How many marbles does Sam have? Estimate: _____ Calculated solution: _____

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Allow learners to work in groups of 3's. Learners take turns rolling a die and using the results to form three–digit numbers that they expand in various ways. Observe learners as they engage in the game. **Product: Exit Cards** Prepare story cards for learners to read and represent. From these, learners will make estimates. Observe learners as they work, check for errors, and allow corrections. Allow learners to create stories or situations which they can give to partners or peers to complete.	

Additional Resources and Materials
Base ten blocks, number cards, Tarsia puzzles: Math puzzle maker, place value charts, hundred charts, dice

Additional Useful Content Knowledge for the Teacher:
Good number sense can be developed by learning about numbers and their relationships. Teachers can achieve this using several concrete materials such as hundred charts, base-ten blocks, place value charts and money. These should be used during instruction to help learners make connections between the concrete, pictorial and symbolic representations.
Provide opportunities for the learners to represent numbers in a variety of ways:
346 = 346 is 1 less than 347, 10 more than 336, 300 + 40 + 6, 340 + 6, 200 + 146, etc.
The number should be read correctly. For example, the number 527 is read as "five hundred forty - seven." Note that the word "and" denotes the decimal.

Opportunities for Subject Integration:

Mathematics: All topics require counting
Money: Counting amounts, Making combinations
Data Handling: Representing data - Tally marks for the tally charts and numbers for labelling the axis.

Language Arts:
Writing: Learners can write brief descriptions about numbers, including names, place values, and expanded forms.
Comprehension: Use clues and allow learners to read and make inferences/ draw conclusions based on the clues to determine the answer.

Social Studies:
(Data Handling)

General Science:
Body Systems: Skeletal System: Number of bones in the body
Body Parts: Fingers/Toes - five on one hand/foot, ten in all; some parts come in pairs - nostrils, eyes, ears, hands, legs, breasts.

Arts and Crafts: Draw shapes and pictures to expand and represent numbers.

Strategies that Support the Curriculum and Assessment Framework

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Elements that are integrated across subjects:

Elements from Local Culture, Technology, TVET, and Environment that are integrated:

Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

Introduction to the Subject:
Strand (Topic): Number Sense
Essential Learning Outcomes: - Whole Number – Comparing and Ordering Quantities
Grade Level Expectations and/or Focus Questions: - Estimate the size of sets (up to 1000) using referents; - Compare two three-digit numbers using a variety of strategies (including place value based on meanings of the hundreds, tens, and ones digits); Use >, =, and < symbols to record the results of comparisons; - Apply strategies to contextual situations and create story problems involving the comparison of whole numbers; - Round numbers to determine estimates; Tell the number that is 100 or 1000 more or less than a given number.

<table>
<tr><th>Specific Curriculum Outcomes:</th><th>Inclusive Assessment Strategies:</th><th>Inclusive Learning Strategies:</th></tr>
<tr>
<td>Key Skills: Comparing and Ordering

Learners will be expected to:

<u>Knowledge</u>
1. Differentiate the terms ‘ascending order’ and ‘descending order.’

2. Read the signs and symbols for comparing (<, > and =)

<u>Skills</u>
3. Compare three-digit numbers up to 999 using >, < and =

4. Order numbers up to 1000 in ascending and descending order.

5. Round three-digit numbers to 1000 to determine estimates.

6. Estimate numbers up to 1000 using referents.

<u>Values</u>
7. Create and solve story problems involving comparing whole numbers.</td>
<td>Product:
Have learners use number cards with the number written in either ascending order or descending order and determine the specific order for the numbers.

Observation:
Give learners symbols on cards, flash the symbol card, and listen as learners read each symbol correctly.

Product: Work Cards:

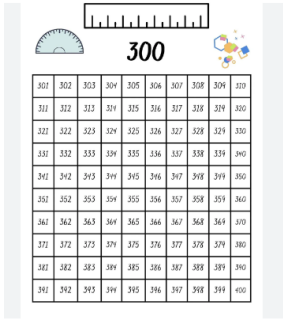
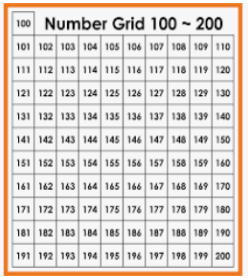
Set up different workstations in the classroom using 10s and 100s as referents. Give learners a card that can be used to record the estimates at each station. Observe learners as they work through each station.

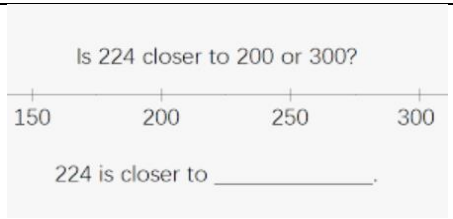
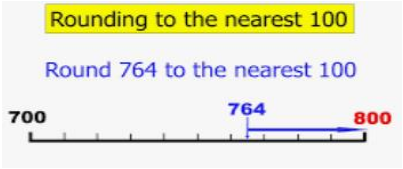
Work card:
<table><tr><th>Station</th><th>Estimates Amount</th><th>Actual Amount</th></tr><tr><td>1. counters
2. dry pasta
3. marbles</td><td></td><td></td></tr></table></td>
<td>Provide learners with experiences where the terms ‘ascending order’ and ‘descending order’ are used.

For example, give learners a set of values, and they describe the order and justify their responses.

<table><tr><td>756 757 759 801 802</td></tr></table>
<table><tr><td>421 438 389 301 299</td></tr></table>
Let learners use the symbols >, <, = and replace them using words of phrases greater than or more than, fewer than or less than and the same as.

Get learners involved in activities that allow them to estimate the number of groups of tens and hundreds as a referent.
For example:</td>
</tr>
</table>

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Think - Pair - Share: Provide learners with exercises to insert symbols or to make statements true. Learners will discuss the best option among themselves. Observe and listen as learners complete activities and engage in discussion about the best choice among the symbols. Example: 197 _____ 821 314 _____ 341 500 _____ 200 + 300 459 < _____ _____ > 702 _____= _____ **Observation:** Allow learners to use number card cut-outs and place them in ascending or descending order. Learners work in groups and take turns to choose number cards. Observe as the learners place cards in ascending or descending order. **Think - Pair - Share** Observe and listen to learners as they round three-digit numbers up to 1000 with the use or aid of number lines. For example:	 (Google image) Allow learners to use symbols <, >. and = when comparing two or more three-digit numbers. For example: 247 > 174 801 < 810 400 = 300 + 100 Provide learners with opportunities to arrange a set of three-digit numbers in ascending or descending order and use the various number charts and number lines to verify answers. Examples of number charts: 200, 300, 400  

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 (Google image) **Product:** Allow learners to use drawings to create and represent story problems. Learners will discuss the best solution for the problem with peers and justify their choices. Teachers will observe and listen as learners share responses.	Let learners gain experience in rounding three-digit numbers when making estimates. Make use of poems or rhymes and number lines to help learners round the numbers to the nearest 10's and 100's. For example: Round the number to the nearest 100  (Google image) Provide opportunities where learners can create story problems, role play, estimate, and discuss solutions as they compare three-digit numbers, objects, or sets. For example: Tim has 642 marbles. Shorn has 254 marbles. How many fewer marbles does Shorn have than Tim?

Additional Resources and Materials:

Hundreds charts, number lines, ten frames, dice, cards, concrete materials

Additional Useful Content Knowledge for the Teacher:

Estimation is a math skill which allows learners to determine an appropriate value or quantity by usually referring to referents.
Reasoning skills help with estimating. Referents are essential to use when estimating.

Opportunities for Subject Integration:

Mathematics: All topics require counting
Money: Counting amounts, Making combinations
Data Handling: Representing data - Tally marks for the tally charts, numbers for labelling the axis.

Language Arts:
Writing: Learners can write their own story problems to be used for assessment or in subsequent lessons.
Comprehension: Use clues and allow learners to read and make inferences/ draw conclusions based on the clues to determine the answer.

Social Studies:
(Data Handling)

General Science:
Body Systems: Skeletal System: Number of bones in the body
Body Parts: Fingers/Toes - five on one hand/foot, ten in all; some parts come in pairs - nostril, eyes, ears, hands, legs, breasts.

Arts and Crafts:
Draw shapes and pictures to represent numbers.

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Elements that are integrated across subjects:

Elements from Local Culture, Technology, TVET, and Environment that are integrated:

Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

Introduction to the Subject: *Identifies the purpose and goals of the subject area with links to the Vision and the Essential Education Competencies.*
Strand (Topic): Number Sense
Essential Learning Outcomes: Whole Number – Understanding Place Value
Grade Level Expectations and/or Focus Questions: - Understands 100 can be thought of as a bundle of ten tens—called one "hundred" or a bundle of 100 ones; - Understands that the numbers 100, 200, 300, 400, 500, 600, 700, 800, and 900 refer to one, two, three, four, five, six, seven, eight, or nine hundred (and 0 tens and 0 ones); - Can represent the place value of numbers in base-ten groupings; - Can explain the pattern regularity of the place value system; - Can identify the value of a digit as determined by its position; - Use place value understanding to round whole numbers to the nearest 10 or 100; - Represent the place value of numbers in various groupings concretely, pictorially, contextually, verbally and symbolically; - Explain the pattern regularity of the positional structure of the place value system; - Identify the value of a digit as determined by its position.

<table>
<tr>
<th>Specific Curriculum Outcomes</th>
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</tr>
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<td>

<u>Knowledge</u>

1. Determine the place value of each digit in the numbers 100 and 200. …, 900
2. Identify the place value of any digit in a 3 or 4-digit number
3. State the value of any digit in a 3 or 4-digit number based on its position
4. Round whole numbers to the nearest 10 or 100

<u>Skills</u>

5. Use concrete materials to represent a bundle of ten tens (100 ones)
6. Use concrete and pictorial materials to represent the place value of a given number

<u>Values</u>

7. Create patterns involving the place value system using real-life situations and concrete materials.

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SCO 2

<u>Think Pair Share</u>

Provide learners with cards with varying amounts of money written on them. Allow them to use play money to represent the amount on each card. This can be done in pairs or groups of three or four. Observe them as they work together. Allow them to discuss and present to the class.

Use a checklist to assess them.

Learner can represent:	Yes	No
1. Thousands using bundles of $100 notes. 2. Hundreds using bundles of $10 notes. 3. Tens using bundles of $1 notes. 4. 2-digit numbers using play money. 5. 3-digit numbers using play money.		

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SCO 2

Learners can use play money (Notes- $1, $10, $100, $1000) to identify the place value of given digits in a number. They can bundle and count to represent various amounts.

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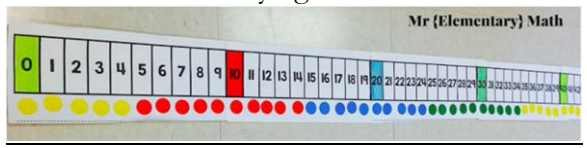
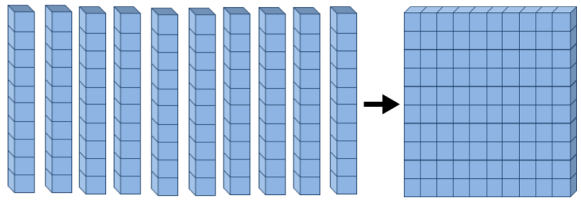
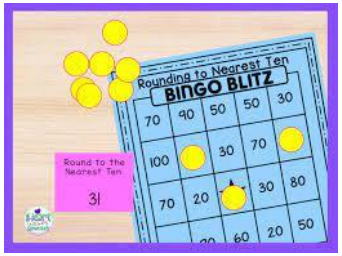
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	6. 4-digit numbers using play money.	**SCO 4** • Use number lines to allow learners to visualize the concept of rounding off. Have them highlight and write out all the numbers that round to 10, 20, 30, etc. Discover and discuss patterns involved when identifying these numbers.  **Source: https://mrelementarymath.com/rounding-101-number-lines-games-and-more/** **SCO 5** Learners will use base ten rods, popsicle sticks, play money or any other suitable countable material to represent a bundle of ten tens (100 ones)  They can use this model to find out how many bundles of ten tens make 100, 200, 300, 400, etc.
	SCO 4 **Product-Exit Tickets:** • Distribute rounding-off cards and observe learners as they work in pairs to identify the numbers that are rounded off incorrectly. Allow them to use error analysis techniques and make corrections for cards with errors. • **Product- Playing Games** Play Bingo and allow learners to have fun consolidating the concept of rounding off. Encourage them to engage in the process of making Math games by allowing them to use numbers of their choice to write the number cards (see the pink card in the picture below)  	

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
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SCO #5 - Class Presentation

Each pair of learners will use their base ten rods (or other material) to represent a multiple of 100, as written on cards.
Learners will then use their materials to present their representations of numbers identified by the teacher or their peers to the class.

SCO 1, 2, 5 & 6 - Rating Scale

Assess each learner by asking them to represent a given number using dienes blocks. Use a rating scale such as the one below.

<table>
<tr><th>Learner can:</th><th>1</th><th>2</th><th>3</th></tr>
<tr><td>1. Use the correct number of blocks to represent
a) tens
b) hundreds
c) thousands

2. Represent any number correctly using dienes blocks.

3. Provide a reasonable explanation for the number of blocks used to represent</td><td></td><td></td><td></td></tr>
</table>
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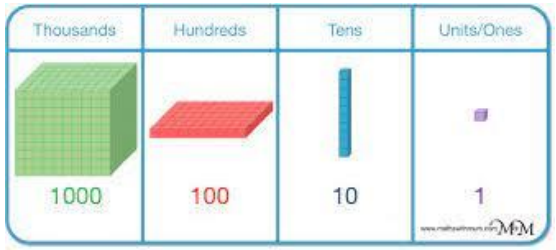
<td>
SCO 1, 2, 5 & 6

Provide each pair of learners with dienes blocks (base ten blocks). Allow them to engage in peer tutoring by using those blocks to represent given numbers and identify place values.



SCO 3 & 6
</td>
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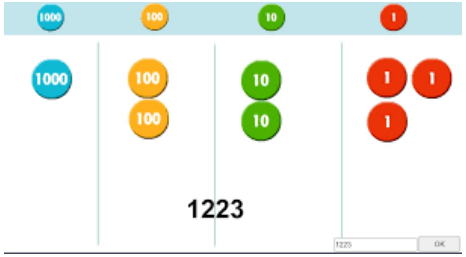
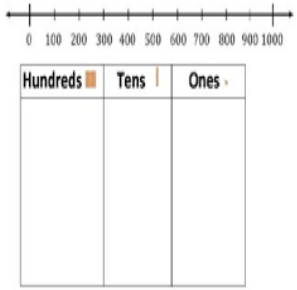
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	each digit in a number. | | | | 1- No understanding 2- Little understanding 3- Moderate understanding 4-Complete mastery Use the results from the rating scale to categorize learners according to the following: UNDERSTANDING -The learner provides the highest level of response and accuracy in explanation. Can represent any given number (including zeros) using dienes blocks. CONSTRUCTION - Evidence of understanding but lacks consistency. EMERGENT - The Learner can represent numbers using dienes blocks but cannot provide meaningful explanation. **Use of Technology** Allow learners to manipulate objects to enhance understanding of concept. Use websites such as www.geogebra.org **https://www.geogebra.org/m/NvD9GjVA#material/a6PFKp8s**	Provide students with number discs and place value cards or mats. Numbers written on the board or cards will be represented on place value cards or mats. Ask students to write and represent a number on the place value mat using number discs. Engage them in reversible thinking by placing discs on the place value mat and having them identify the number represented.   Introducing Place Value Using Number Disks Place Value Number Disc - Math tutorial video - Place value for kids - YouDo STEM Videos

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	SCO # 3, 6 **Whole Group Class Discussion** Place discs on place value cards or mats. Use questioning techniques to assist in developing conceptual understanding. Examples of questions: 1. How many discs are there in the tens column? 2. What digit is in the tens column?" 3. If I remove one disc in the hundreds column, what will my new number be? 4. Is it possible to have twelve discs in the ones column? Why? or Why not? **Use of Technology** Use interactive worksheets or games to assess learners understanding of the concept in a fun and exciting way. Example: https://www.geogebra.org/m/awS83JcY **SCO # 7 - Class Discussion** Using teacher-made number lines of various groupings, learners will count, and individual learners will come up to insert the missing numbers after observing the patterns. They will give reasons for their answers. Ensure that the number lines presented are of increasing difficulty so as to	**SCO # 7** Use number lines to develop an understanding of the patterns involved in the place value system. Have students count by tens and hundreds using number lines. Have them follow the patterns to fill in the blank spaces. Allow them to represent numbers on the number line on a place value chart. Form connections between various number lines and place value charts. 

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	identify each student's level of mastery of the concept. For each number line, allow learners to represent numbers on a blank place value chart. Allow them to discuss and share observations regarding connections between number lines and place value charts.	

123987**Additional Resources and Materials**

https://files.eric.ed.gov/fulltext/EJ961655.pdf

Additional Useful Content Knowledge for the Teacher: (*any additional knowledge that the writers believe would be helpful for the teacher, such as reading material at a lower or higher grade level, links to curriculum documents for other grades)*

Opportunities for Subject Integration: *(Additional ideas about how the inclusive learning strategies might be adapted and/or applied to include other subjects in the curriculum)*

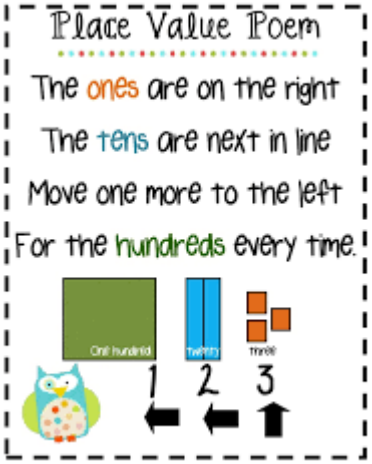
Strategies that Support the Curriculum and Assessment Framework

This section is optional and intended to assist writers as they check the curriculum to the Curriculum and Assessment Framework. It can be used at the discretion of the Team Leads and PICT Subject Specialists. It will be used to guide the writing but will not appear in the curriculum guides.

Elements that are integrated across subjects:

Elements from Local Culture, Technology, TVET, and Environment that are integrated:

Items of Inspiration (teaching tips, inspirational passages, connections to educational research):



https://www.pinterest.com/pin/101331060341321979/

Number Sense ELO N2.1

Introduction to the Subject:

Fractions form a part of learners' daily lives. They occur naturally whenever they want to consider sharing a portion of an object or quantity. A child recognizes that it is not always possible to get a whole object, collection or quantity but can get a part of it. Hence, it is a good idea to connect the teaching of fractions to something they already know. For example, their favourite foods or snacks. The use of these real-world manipulatives (area or set models) offers a simple, visual and concrete way for learners to begin to conceptualize fractions. However, it is of utmost importance that students understand that a fraction is not only a part of a whole or set but it is a number which always specifies how much of a unit amount or set there is. The use of the linear model (number line) helps students to visualize that this part of a whole or set is a number which is more/less than 1 but more than 0. It also allows students to be able to see the magnitude or size of fractions as they build up by adding unit fractions.
At the grade level 3, the focus of teaching fractions is to help learners conceptualize fractions, not only as a part of a whole but as a number which lies between the point 0 and 1 when represented on a number line.

Strand (Topic): Number Sense

Essential Learning Outcomes: Fractions, Decimals and Rational Numbers– Representing Fractions

Grade Level Expectations and/or Focus Questions:

- Represent proper fractions as equal parts of one-whole region, set or measure concretely, pictorially (including number lines), and symbolically.
- Understand a fraction as a number o n the number line; represent fractions on a number line diagram. (a. Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts.
- Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.
- Represent a fraction a/b on a number line diagram by marking off a length 1/b from 0.
- Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line

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<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
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Knowledge

1. Recognize a whole or unit amount or set can be partitioned into B equal parts, then 1/B of the whole is the amount formed by one part.
2. Generalizes the fraction a/b of the whole as the amount formed by A parts, each of 1/B of the whole or set.
3. Recognize that a fraction 3/4 on a number line consists of a 3-part line segment where its left endpoint is at 0 and its right endpoint locates the number 3/4 on the number line.

Skill

4. Depict concretely, pictorially (including number lines) and symbolically a proper fraction which denotes a fraction A/B (which tells us how many (A) of what size parts 1/B there are in a whole or set).
5. Represent the fraction A/B with equal lengths on a number line between the line segment 0 to 1, (where A/B is located to the right of zero at a distance of A/B units from 0).
6. Identify segments between 0 and point 1/B on a number line (to show that the segment between 0 and 1/B consists of 1 piece, which is 1/B of a unit long)

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SCO 1 & 4

Observation:

Use the following observational checklist below to monitor learners as they engage in pizza making and sharing activity.

Behavioural Criteria	E	S	NI
1. Creates pizza models 2. Pay attention to equal partitioning while cutting each pizza. 3. Identifies the denominator of the fraction as the number of parts the pizza was divided into. 4. Identifies the numerator as the total number of each part given away			

E -Excellent, S- Satisfactory, NI- Needs Improving

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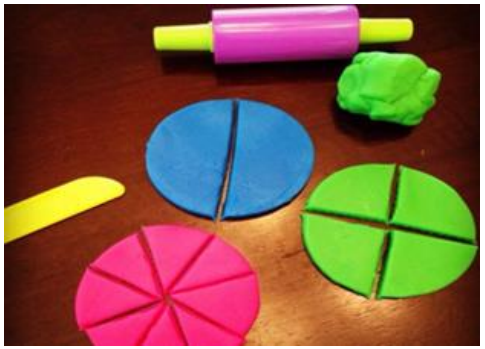
SCO 1, 2 & 7

Group Work: Sleepover Pizza Sharing Segment

Provide learners with all the necessities for pretense pizza making exercise using playdough. Allow each group to engage in making three pizzas. Give each group a card instructing them on how the pizza should be shared. Emphasize the need for equal sizes while sharing each pizza. Instruct learners to label the pizzas: Pizza 1, 2 and 3.

For example:



Retrieved from: https://www.charter.coventry.sch.uk/blog-12b-201920/2020/6/5/playdough-maths-j66ws

Example of Questions:

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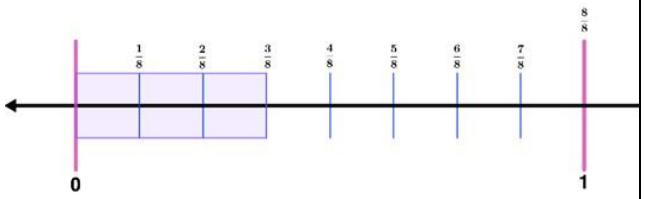
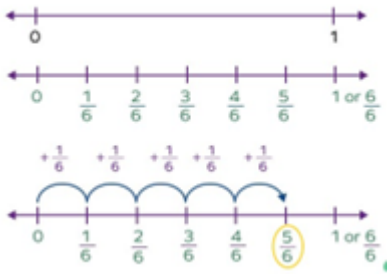
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Value 7. Display the willingness to explain the pictorial, concrete or symbolic representation of proper fractions during class discussions. 8. Create a poster chart of things in the immediate environment that can be represented as a fraction of its whole	**SCO 4 & 8** **Think Pair Share: Fraction Poster** Provide each pair of learners with a paper and crayons to draw a pictorial representation of a set of items. Instruct them to colour the number of items they wish to give away and represent their diagram symbolically as a fraction. Allow each pair of learners the opportunity to display their work by sticking it on a fraction sharing poster. **Individual or Group: Show and Tell** Allow pairs of students to dip for a fraction. Have students represent their fraction on a number line. Ensure that students colour the segment from 0 to their fraction a/b. Provide students with the opportunity to present their fraction and explain their pictorial representation. *Example; 3/8*	1. How many equal sizes did you make out of pizza 1? 2. If you removed one piece of pizza from pizza 1, what fraction of the whole pizza would this represent? 3. If you removed two pieces out of the pizza, what fraction of the whole does this represent? Instruct learners to answer these questions for pizza 2 and 3 respectively. **SCO 1, 2 & 7** **Guided Discovery: How many items form my whole?** In pairs, provide learners with a packet of food items or a set of items. For example; skittles. biscuit, M and M, gummy worms. Ensure that learners have clean paper plates to pour and count the number of items in the packet. Use guided questions to help learners understand the concept of a whole as a set. **Example of Questions:** 1.What item do you have? 2. Is it a whole packet or some from the packet?

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 *Retrieved From: https://helpingwithmath.com/fractions-on-a-number-line/*	Have learners open the packet of snacks and pour the contents on the plate. Example:  Retrieved from: https://westcoastconfection.com/product/thugs-in-harmony-classic-cookie-collection/ 3. How many items are in the whole packet? 4. If you give your partner one out of your set of items, what fraction of the whole did you give them? Instruct students to represent this fraction symbolically on the paper. 6. If you take one as well, what fraction of the whole did you take? 7. If you give your partner another one out of the set of items, what fraction of the whole does he now have?

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		Provide each pair of learners the opportunity to present and explain their answers to the class. After each pair of learners make their presentation, use the following questions to guide them to make generalizations about the denominator as the number of parts in the set and the numerator as the total number of each part given away. **Example of Questions:** 1. How many items were in Peter and Paul's packet? 2. What fraction does each item represent? 3. What is the denominator of Paul and Peter's fraction? 4. Is it the same as the number of items in the packet? **Number line Fraction Show** In pairs, provide learners with a paper with two number lines. Explain to students that a number line has points representing whole numbers starting from 0 to 1, and 1 to 2. Explain to students that each number segment represents a whole. Revert to previous lessons and associate the whole 0 to 1 with a pizza. Which can be cut into equal parts, where each part represents one segment of the whole pizza.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		Begin by cutting the whole (pizza) in two equal parts. Allow students to colour one segment of that pizza. By colouring from 0 to the point in the middle. Question students to find out: 1. What part of the whole is represented by the segment shaded? 2. What part of the whole is represented by the unshaded segment? Have students represent symbolically the line which shows ½ on the number line. Repeat this activity using the whole as a set of 4 items. Question students to find out how many equal segments should be placed between 0 to 1. Provide guidance to each pair of students as they draw their lines. Place emphasis on point one as the end of the last segment. Have students colour each segment a different colour to show that each segment represents ¼. Allow students to represent each segment with the correct fractions to show, ¼, 2/4/, ¾.,4/4 For example:

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		 Retrieved From: https://www.splashlearn.com/math-vocabulary/fractions/fraction-number-line

Additional Resources and Materials

Scissors, rulers, pattern blocks, paper, paper plates

Books/Literature

Fraction fun by David Adler and Nancy Tobin

Full House: An Invitation to Fractions by Dale Ann Dodds

Fraction action by Loreen Leedy

Polar Bear Math: Learning About Fractions from Klondike and Snow by Ann Nagd

The Lion's Share by Mathew McElligott

Whole-y Cow! Fractions are Fun by Taryn Souders

Additional Useful Content Knowledge for the Teacher: (*any additional knowledge that the writers believe would be helpful for the teacher such as reading material at a lower or higher grade level, links to curriculum documents for other grades)*

Opportunities for Subject Integration:

Art and Craft

create collages

creating picture or patterns

creating models of fractions on sidewalks with chalk

Creating board and floor games

Making paper plate cutouts

Science and Technology

Make use of fractional paper or plates to create scientific models

Experimental skills: Sharing Resources, grouping

Creating and Interpreting Flow Charts

Social Studies

Collaboration and communication skills to complete a given chore

Group and Functions: Task sharing

Civic responsibility: equity and equality

Language Arts
Compose poems riddles about fractional parts.
Create story problem booklets

Create flip books explaining fraction of a whole or set
Oral Communication: Question and Answer sessions on fractions
Making video to explain process of sharing a whole into fractional parts

Music

Compose songs and jingles

Use music notes to demonstrate sharing

Strategies that Support the Curriculum and Assessment Framework

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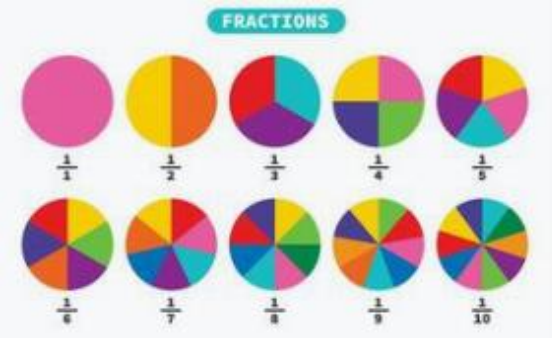
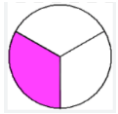
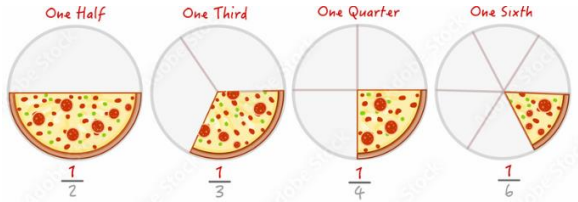
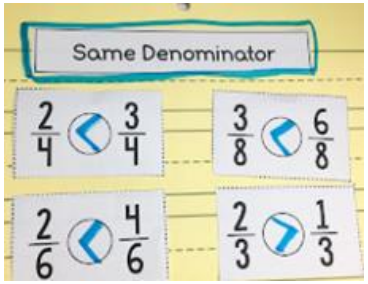
Elements that are integrated across subjects:

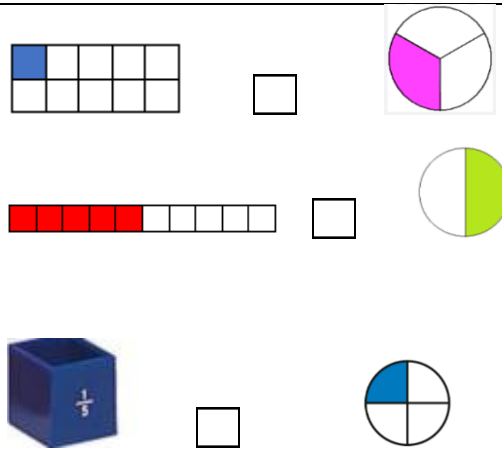
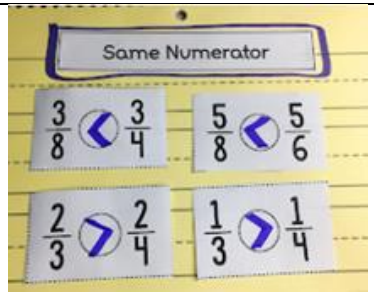
Elements from Local Culture, Technology, TVET, Environment that are integrated:

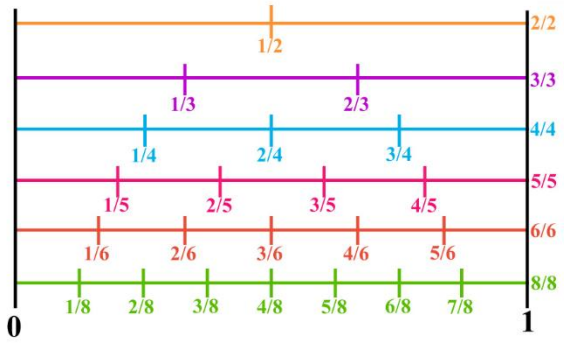
Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

Introduction to the Subject: *Identifies the purpose and goals of the subject area with links to the Vision and the Essential Education Competencies.*
Strand (Topic): Number Sense
Essential Learning Outcomes: Fractions, Decimals and Rational Numbers – Comparing and Ordering Fractions
Grade Level Expectations and/or Focus Questions: - Compare two fractions with the same numerator or the same denominator by reasoning about their size. - Explain that comparisons of fractions are only valid when the two fractions refer to the same one whole. - Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model. - Compare and order a set of fractions by identifying the approximate position of those fractions on a number line; - estimate the fraction represented by a given model; - apply strategies to contextual situations involving the comparison of fractions; - create story problems involving the comparison of fractions; - name a fraction that is greater than or less than a given fraction or between two given fractions.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
<u>Knowledge</u> 1. Compare fractions with the same numerators or same denominators by reasoning about their size (using a number line, concrete and pictorial fraction representations). 2. Arrange a set of fractions in ascending or descending order 3. Determine which fractions are greater, equal to or less than the other (Use symbols >, < or = to compare fractions) **<u>Skills</u>** 4. Represent fractions using concrete and pictorial models and use the models to compare fractions visually. **<u>Values</u>** 5. Use fractions to solve real-life problems. - Apply knowledge of fractions to solve problems, e.g. sharing items and food. -Create story problems that involve comparison of fractions	**SCO 1** **Worksheet** Compare each pair of fractions. Write <, >, or = to show a comparison. Describe one strategy you used to solve each comparison problem. 1. $\frac{1}{4} \square \frac{2}{4}$ 2. $\frac{3}{5} \square \frac{5}{5}$ 3. $\frac{2}{3} \square \frac{1}{3}$ 8. $\frac{1}{9} \square \frac{8}{9}$ 9. $\frac{4}{4} \square \frac{4}{4}$ 10. $\frac{3}{4} \square \frac{2}{4}$ **SCO 2** Portfolio Assessment Draw and colour shapes to show the different fractions. Give learners diagrams partitioned into equal pieces and ask them to colour a particular fraction.	**SCO 1, 2, 3 & 4** **Group work:** Designing Pizzas Learners will create pizza models using cardboard or bristol board and paper plates. The pizzas will be divided into equal slices to represent fractions. For example, the pizzas can be divided into equal parts of 2, 3, 4, 6, 8  Retrieved from: https://www.vecteezy.com/vector-art/27512003-vector-drawing-of-fractions-worksheet Learners will discuss and compare the fractions in relation to the number of pizza slices. Learners should be able to reason that the more slices a pizza is divided into, the smaller the size of the slices.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Allow students to create or compile a portfolio to show the different colourful fractions in ascending or descending order. **SCO 3** **Fill in the Blanks** Place the correct fraction next to the shape. ½, ⅓, ¼, ⅕.  _____  _____  _____ Teacher will observe that the learners place the correct fraction next to the shade circles. Teacher questions the learners about each fraction placed next to the diagram. Insert >, = or < in the box provided	For example, if a pizza is divided into 2 equal slices, each slice represents ½; if a pizza is divided into 4 equal slices, each slice is ¼, etc.  Retrieved from: https://stock.adobe.com/images/fraction-pizzas-whole-one-half-semi-halves-quarter-third-sixth-pieces-slices-pizza-equal-rate-cut-pizza-fractions-broken-numbers-examples-chart-graphic-illustration-vector/468327550 **Demonstration Charts** 

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 The teacher observes as learners place the signs and asks students to give reasons why they chose the particular sign. **SCO 3** **Game** Fraction Matching Bingo Develop bingo cards with fractions and shaded diagrams written on them. The teacher calls out statements, e.g. a fraction larger than ½, a diagram that shows a shaded area of ⅓. Learner identifies the corresponding value on the card	 **SCO 2 & 3** **Large group instruction/whole (reinforcement/wrap-up)** Learners will be shown fractions on a number line as well as on a fraction wall/ chart. The number line or fraction wall can be used to show that the fraction is part of a whole. Learners will be shown how fractions can get smaller by dividing the whole into smaller parts. The number line or fraction wall/chart can be used to compare fractions and demonstrate fractions in ascending or descending order. **Number line**

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	with a counter. Learner who gets all in a straight line wins the bingo game. **SCO #4** **Game** Learner will match the fraction cards with corresponding shapes.  The teacher observes that the fraction cards are matched to the correct shaded shape. **SCO 5**	 Retrieved from: https://www.free-math-handwriting-and-reading-worksheets.com/fraction-number-line.html **Fraction Wall**  Retrieved from: https://www.teacharesources.com/product/fraction-wall/

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies:</th><th>Inclusive Learning Strategies:</th></tr>
<tr>
<td></td>
<td>
The teacher will observe learners as they share the items using the appropriate fraction, e.g. ½, ¼, etc. and as they use the appropriate vocabulary, bigger, smaller.

Checklist
<table>
<tr><td>The learner:</td><td>Yes</td><td>No</td></tr>
<tr><td>Shared the food items using appropriate fractions</td><td></td><td></td></tr>
<tr><td>Used vocabulary to describe the sizes of the fractions correctly.</td><td></td><td></td></tr>
</table>
</td>
<td>
SCO 3 & 4

Small Groups (three or four students)

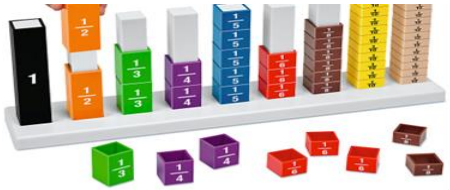
Comparing fractions using the equal, greater than and less than vocabulary.

Learners will create a balance using a clothes hanger, strings and plastic cups.
Learners will place the fraction parts from the fraction stax or fraction tiles in the cups of the balance scales and compare the fractions using the vocabulary - equal, greater than and less than.
Learners will record their answers on paper.


https://www.wikihow.com/Make-a-Balance-Scale-for-Kids

SCO 4
Working in Pairs

Learners working in pairs will arrange fractions
</td>
</tr>
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		stax to show different unit fractions. By placing the fraction parts next to each other, learners will be able to compare fractions. For example, ½ is bigger than 1/3  Retrieved from:https://www.lakeshorelearning.com/products/math/fractions-decimals-percents/fraction-staxsup-sup/p/FR774/ **SCO 5** **Group Work** Food Sharing: Have learners cut up sandwiches or share food items into different fractions and then compare the slices or pieces. Discuss which fraction is bigger or smaller. Food Preparation:

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		Give learners ingredients to prepare simple food items. For example, making a glass of juice using: ½ a teaspoon of sugar, one cup of water, ¼ teaspoon of powdered juice mix etc.

Additional Resources and Materials

Cuisenaire rods, 1 squared cm grid paper, uni-fix cubes

Books

Working with Fractions by David Adler

The Wishing Club: A Story about Fractions by Donna Jo Napoli

A Fractions Goal - Parts of A Whole by Brian Cleary

Additional Useful Content Knowledge for the Teacher: (*any additional knowledge that the writers believe would be helpful for the teacher, such as reading material at a lower or higher grade level, links to curriculum documents for other grades)*

Opportunities for Subject Integration:

Science
Use of fractions in measuring components/reagents for experiments.

Social Studies
Fractions of the districts in the country are towns and villages.

Sports
Distance a cricket ball is thrown
Time taken to complete a race
Distance jumped

Music
Musical whole note can be divided into parts (halves, quarters, eighths, sixteenths)

Strategies that Support the Curriculum and Assessment Framework

This section is optional and intended to assist writers as they check the curriculum to the Curriculum and Assessment Framework. It can be used at the discretion of the Team Leads and PICT Subject Specialists. It will be used to guide the writing but will not appear in the curriculum guides.

Elements that are integrated across subjects:

Elements from Local Culture, Technology, TVET, and Environment that are integrated:

Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

Introduction to the Subject:

Decimals are used to express a number on the scale of tens. It uses a point to separate the whole part of a number from the fractional part of a number. The use of decimals allows quantities to be expressed more accurately.

In this unit, learners will learn to read and write decimals, represent fractions as decimals, and explore real-life situations.

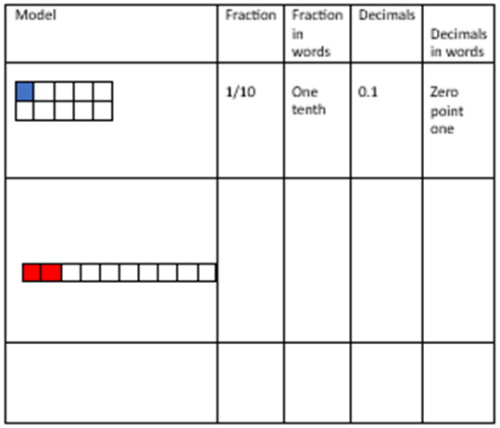
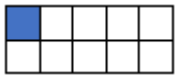
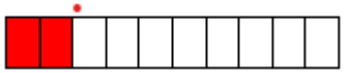
Strand (Topic): Number Sense

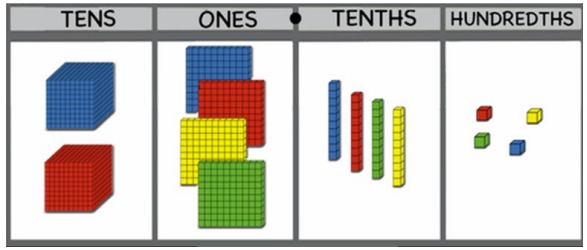
Essential Learning Outcomes: Fractions, Decimals and Rational Numbers – Representing Decimals

Grade Level Expectations and/or Focus Questions:

- Represent decimals using concrete materials and pictorials (1/2, 1/3 and 1/4);
- Describe decimals in context, verbally and symbolically

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Knowledge 1. Describe decimals as a way to represent parts of the whole **Skills** 2. Represent fractions (½, ⅓, ¼, ⅕) as decimals using concrete materials/ visual aids	**SCO 1** Learners will place the missing information in a table, as shown below. Learners will be given either models, fractions, decimals or words, and they are to complete the missing sections of the table.	**SCO 1** **Demonstration** **Working in Pairs** Use of visual aid by the teacher.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Values 3. Use decimal notation in different contexts, such as money, measurement, etc.	 **SCO 2** **Product** Teacher places a Fraction/ Decimal chart on the board or wall. Learners will be given fraction and decimal cards and will be required to place them in the appropriate section.	Working in pairs, learners will divide a rectangle, which represents a whole, into ten equal parts.  Each part represents the fraction, 1/10 Learners will be informed that 1/10 as a decimal is 0.1. Learners will shade two parts of the rectangles and represent the fraction 2/10, which would be written as 0.2 as a decimal.  **Working Individually** Decimals will be demonstrated using a number line. Learners will be given cut outs of a number line. Teacher will demonstrate how the decimals obtained above are placed on a number line and students will complete their individual number lines in a similar fashion. 

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	<table><tr><th>Fraction</th><th>Decimal</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table> $\frac{1}{5}$ 0.2 0.5 0.25 $\frac{1}{4}$ $\frac{4}{10}$ 0.4 $\frac{1}{2}$ Teacher observes as the learners place the cards in the appropriate section.	**SCO 1** **Base 10 blocks to show Decimals** One rod is made of 10 unit blocks to represent a whole. Blocks can be divided into 10 parts to show decimals for tenths. Use the table below to place images of blocks.  Retrieved from https://mathcurious.com/2020/09/28/representing-decimal-numbers-using-base-10-blocks-printable-and-digital-activity-cards/

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr>
<td></td>
<td>
<table>
<tr><th>Criterion for Matching</th><th>Yes</th><th>No</th></tr>
<tr><td>Learner's Name:</td><td></td><td></td></tr>
<tr><td>Matches the correct fraction to its decimal and correct decimal to its fraction</td><td></td><td></td></tr>
</table>
SCO #3
Learners will visit a local shop and write the prices of four items. The items should include items that are less than a dollar and more than a dollar.
Complete the table below.
<table>
<tr><td>Items</td><td>Price per unit ($)</td></tr>
<tr><td>Sweets</td><td>0.25</td></tr>
<tr><td>Water</td><td>2.25</td></tr>
</table>
</td>
<td>
SCO 2
Fraction/Decimal Field Trip


Learners will visit the local bakery, pizza shop, supermarket, etc. Allow learners to purchase slices of pizza, etc., and pay for their items.
Allow learners to share items using fractions, e.g., a quarter of a slice of pizza, half of a chocolate, 0.3 of the cake, etc.
SCO 3
Learners will be shown the association between money and decimals, how dollars can be divided into cents, and how to use coins to represent decimal values.
</td>
</tr>
</table>

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr>
<td></td>
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<table>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
</table>
Checklist
<table>
<tr><td>Criteria</td><td></td></tr>
<tr><td>Learners identified four items</td><td></td></tr>
<tr><td>Learners had items that were more and less than a dollar</td><td></td></tr>
<tr><td>Learners wrote the prices of the items to relate to decimal</td><td></td></tr>
<tr><td>Prices are written with decimal point to show the whole and parts of the whole</td><td></td></tr>
</table>
</td>
<td>
$10.00 (Ten dollars)

$5.00 (Five dollars)

$1.00 (One dollar)

$0.25 (twenty-five cents)

$0.10 (ten cents)

$0.05 (five cents)


https://www.google.com/search?q=eastern+caribbean+coinssymbol&tbm=isch&ved=2ahUKEwiDj5-a6KCCAxWxoIQIHZs-Dj4Q2-cCegQIABAA&oq=eastern+caribbean+coinssymbol&gs_lcp=CgNpbWcQAzoHCAAQGBCABFCsF1iUIWDeJmgAcAB4AIAB3gGIAcYGkgEFMC40LjGYAQCgAQGqAQtnd3Mtd2l6LWltZ8ABAQ&sclient=img&ei=vTlBZcO8DrHBkvQPm_248A
</td>
</tr>
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		M&rlz=1C1CHBF_enLC1036LC1042#imgrc=WYEozPD7wxRDoM

Additional Resources and Materials

Fraction and decimal dominoes

Decimal tiles

Additional Useful Content Knowledge for the Teacher: (*any additional knowledge that the writers believe would be helpful for the teacher, such as reading material at a lower or higher grade level, links to curriculum documents for other grades)*

Opportunities for Subject Integration:

English
- Included in various genres of writing
-

Science
- weights
- lengths

Social Studies
- measurement of rainfall

Strategies that Support the Curriculum and Assessment Framework

Elements that are integrated across subjects:

Elements from Local Culture, Technology, TVET, and Environment that are integrated:

Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

Operation With Numbers ELO 1.1

Introduction to the Subject:
Identifies the purpose and goals of the subject area with links to the Vision and the Essential Education Competencies.
In grade 3, students embark on a crucial stage of their mathematical journey, delving into the world of operations with numbers. This foundational subject area plays a pivotal role in shaping young minds to think logically, problem-solve, and build a strong mathematical foundation. The purpose and goals of operations with numbers in grade 3 align closely with the broader vision of education and the essential competencies we aim to cultivate in our students.
Numerical Fluency: The primary purpose of operations with numbers in grade 3 is to foster numerical fluency. Students are introduced to essential mathematical operations like addition, subtraction, multiplication, and division. They learn to perform these operations confidently and accurately, setting the stage for more complex math concepts in the future.
Problem-Solving Skills: Operations with numbers provide a framework for developing critical problem-solving skills. Students learn to analyze situations, discern which operation is most appropriate, and apply it to real-world scenarios. This enhances their mathematical abilities and equips them with valuable problem-solving skills that extend beyond the classroom.

Logical Thinking: Students cultivate logical thinking and reasoning through operations with numbers. They understand the underlying principles of these operations, such as the commutative and associative properties, and use them to manipulate numbers effectively.

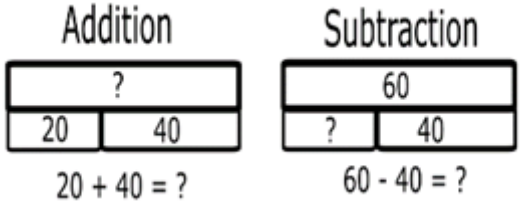
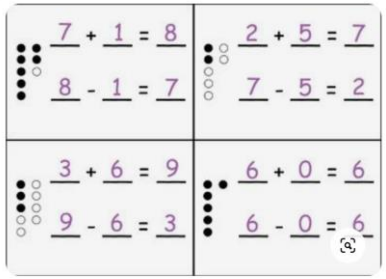
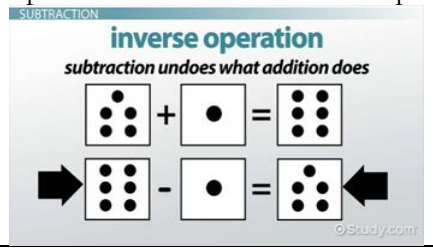
Mathematical Communication: Another essential goal is to enhance students' ability to communicate their mathematical thinking. They learn to articulate their steps, strategies, and solutions clearly, fostering practical communication skills essential in various life aspects.

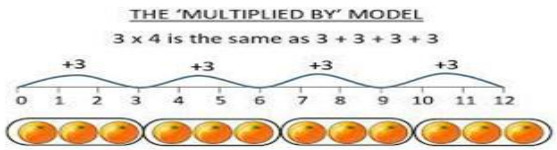
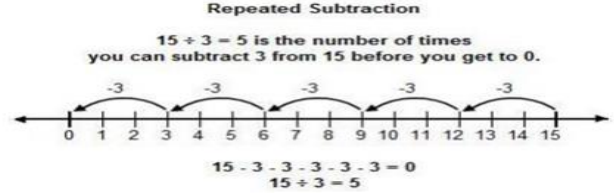
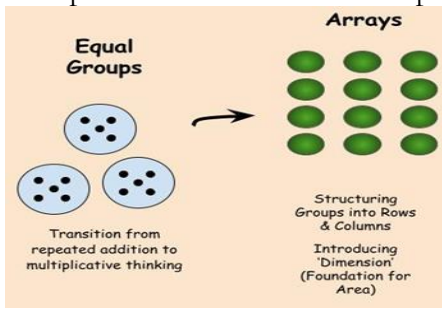
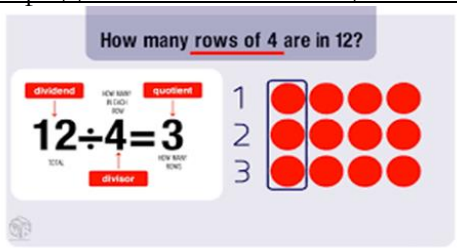
Connecting Concepts: Operations with numbers serve as a bridge, connecting various mathematical concepts. Students begin to see how addition and subtraction relate to multiplication and division. This interconnectedness deepens their understanding of mathematics as a whole.

Preparation for Advanced Math: Grade 3 lays the groundwork for more advanced mathematical concepts in subsequent grades. A solid understanding of operations with numbers is crucial for success in areas like fractions, decimals, and algebra.
The vision for education is to empower students with the knowledge, skills, and attitudes they need to thrive in an ever-changing world. Operations with numbers align with this vision by:

- *Promoting Lifelong Learning:* By equipping students with foundational math skills, we prepare them for a lifetime of learning, problem-solving, and adapting to new challenges.
- *Fostering Critical Thinking:* Operations with numbers nurture critical thinking abilities, teaching students to approach problems with curiosity and analytical thinking.
- *Cultivating Effective Communication:* Through math, students learn to communicate their ideas effectively, a skill that transcends mathematics and benefits them in all areas of life.

Links to Essential Education Competencies: Operations with numbers directly contribute to the development of essential competencies, including: *Numeracy:* By mastering operations with numbers, students build strong numeracy skills that are essential for understanding quantitative information in various contexts. *Problem-Solving:* Operations with numbers are a fundamental platform for honing problem-solving skills, which are valuable in academic, professional, and personal spheres. *Communication:* Articulating mathematical thinking requires effective communication, aligning with clear and concise communication competency. *Critical Thinking:* Analyzing mathematical problems and selecting appropriate operations foster critical thinking skills, an indispensable competency in today's complex world. Operations with numbers in grade 3 serve as a cornerstone of mathematical education, contributing to the broader vision of education and equipping students with essential competencies that will benefit them throughout their lives.
Strand (Topic): Operations with Numbers
Essential Learning Outcomes: ***1.1 Additive Thinking – Understanding the Meaning of Addition and Subtraction and how they Related***
Grade Level Expectations and/or Focus Questions*: Use the properties of operations and the relationships between multiplication and division to solve problems and check calculations*

Specific Curriculum Outcomes	***Inclusive Assessment Strategies***	***Inclusive Learning Strategies:***
1. Recall the basic facts for addition and subtraction. 2. Create and solve problems involving whole number addition and subtraction problems with and without regrouping with results not exceeding 999. 3. Use several strategies to perform multiplication and division of one and two-digit numbers by 2, 3, 4, 5, and 6. 4. Create and solve problems involving multiplication of a two-digit number by 2, 3, 4, 5, 6, 10, and 100, without and with regrouping 5. Use repeated addition and subtraction to multiply and divide a two-digit number by a one-digit number, without and with remainders. 6. Estimate answers to computations involving the four basic operations on whole numbers; 7. Use estimations to determine the reasonableness of answers obtained from carrying out a given computation	***SCO1 and 2*** ***Open-Ended Questions:*** Ask open-ended questions that require students to explain their thinking and justify their answers. ***Example:*** *Explain how you solved 48+25. What strategy did you use, and why did you choose that strategy? If you had to teach someone how to subtract 37 from 64, what steps would you tell them to take?* *Solve 59-29 in more than one way. Can you think of a different strategy to find the answer?* ***Multiple Representations:*** students represent problems using different methods such as diagrams, tables, or charts. This allows them to choose the representation that works best for their understanding.  https://smarterlearningguide.com/strip-diagrams/ **SCO 3 and 4** **Problems with Real-Life Contexts:** Create problems that involve multiplication and division in real-life scenarios.	***SCO 1 and 2*** ***Reflection and Self-Assessment:*** students reflect on their problem-solving processes and assess their own understanding. ***Example: Apply patterns:*** *students recognize patterns in addition and subtraction problems. Identifying patterns can simplify problem-solving and enhance their understanding of mathematical relationships.*  *https://images.app.goo.gl/8zUsxYbeCq7ob9tL6* ***Hands-On Manipulatives:*** Use physical objects like counters, cubes, or base-ten blocks to represent addition and subtraction problems. This provides a concrete, visual way for students to understand the operations and their relationships. 

Specific Curriculum Outcomes	*Inclusive Assessment Strategies*	*Inclusive Learning Strategies:*
	Pizza Party: *Sarah is having a pizza party. Each pizza is divided into 8 slices. If she has 15 pizzas, how many slices of pizza does she have in total for her friends?* ***Toy Sharing:*** *Jake has 24 toy cars, and he wants to share them equally among 6 friends. How many toy cars will each friend get?* ***SCO5*** ***Number Lines:*** *Use number lines to illustrate repeated addition in a multiplication context. Ask students to mark jumps on the number line to represent repeated addition steps.*  *https://www.2nd-grade-math-salamanders.com/beginning-multiplication-worksheets.html* *Use number lines to demonstrate repeated subtraction in a division context. For instance, for 15 ÷3, students can mark jumps on the number line until they reach zero.*  http://kornmath.weebly.com/multiplication-3rd.html **SCO6** **Word Problems:**	https://study.com/academy/lesson/methods-for-teaching-math-operations.html **SCO 3 and 4** **Visual Models:** Utilize visual aids such as arrays, area models, and number lines to illustrate multiplication and division concepts.  https://roomtodiscover.com/visual-models/  https://www.youtube.com/watch?app=desktop&v=sr45yLXUQ9E **SCO 5** ***Reinforce Patterns:*** Students identify patterns on the number line. Discuss how each jump represents one group, and notice how the numbers on the line increase by the same amount.

Specific Curriculum Outcomes	***Inclusive Assessment Strategies***	***Inclusive Learning Strategies:***
	Include word problems in assessments that require students to estimate before solving. Ask questions like "Estimate the sum/difference/product/quotient of these two numbers." Ensure the word problems are relatable to the students' experiences to make the context meaningful.	Students identify patterns on the number line. Discuss how each backward jump represents one division, and notice how the numbers on the line decrease by the same amount. **SCO 6** **Questioning Techniques** Model how to ask estimation questions during class discussions. For instance, ask open-ended questions like, *"Can you estimate the sum of these two numbers? How did you arrive at your estimate?"* Encourage students to use question stems such as *"What is a reasonable estimate for..."* or *"About how much would be the sum/difference/product/quotient of..."*

Additional Resources and Materials
Manipulatives(counters), Number Lines, Maths Worksheets, Maths Story Books, Educational Games (card games, board games, Multiplication Bingo, Math War, Online Math Games

Additional Useful Content Knowledge for the Teacher:
There are 4 basic operations in Mathematics: Addition, Subtraction, Multiplication and Division.
Addition is the inverse operation for Subtraction. 120 + 30 =150 (150– 120 =30) (150 – 30 =120)
Subtraction is the inverse operation for Addition. 187 –54=133 133+54= 187
Multiplication is the inverse operation for Division 5x4=20 20÷5=4 20÷4=5
Division is the inverse operation for Multiplication. 27÷3=9 9x3=27 3x9=27
Multiplication is repeated Addition. 6x4 is the same as 6 +6+6+6
Multiplication and Addition are Commutative. This means that the order in which you perform the operation does not change the answer.
Example: 8x7=56 7x8=56… 3+7+9=19 7+9+3=19
(Sum means to Add). (Difference means to Subtract). (Product means to Multiply). (Quotient means to Divide)
Multiplicand x Multiplier=Product Dividend ÷ Divisor= Quotient

Opportunities for Subject Integration:

Language Arts:
- Reading word problems that involve math operations.
- Writing word problems to reinforce understanding.
- Practicing mathematical vocabulary.
- Mathematics Storybooks

Science:
- Measuring and recording data, then performing basic calculations.
- Studying patterns and sequences in nature that involve math concepts.
- Using math in science experiments and data analysis.

Social Studies:
- Calculating distances on maps.
- Analysing population data using basic math operations.
- Understanding historical events and timelines through math

Physical Education:
- Measuring distances, time, and scores in sports activities.

Art:
- Creating geometric patterns and designs.
- Using shapes and measurements in art projects.

Health Education:
- Calculating nutrition facts, serving sizes, and daily intake.
- Analysing growth charts and health statistics.
- Understanding the importance of math in making healthy choices.

Strategies that Support the Curriculum and Assessment Framework

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Elements that are integrated across subjects:
Critical Thinking:
Problem-Solving Skills

Language and Communication
Measurement and Units:
Environmental Science:
Technology Integration
Visualization

Elements from Local Culture, Technology, TVET, and Environment that are integrated:

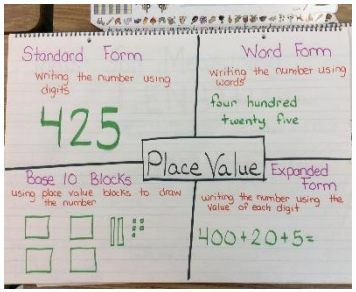
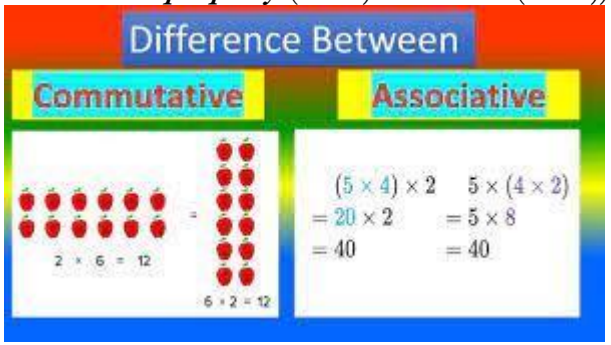
Counting Games (Hop Scotch, Pick Pick, Marble playing)
Singing Multiplication Tables.
Sou Sou.
Schools Saving Union.

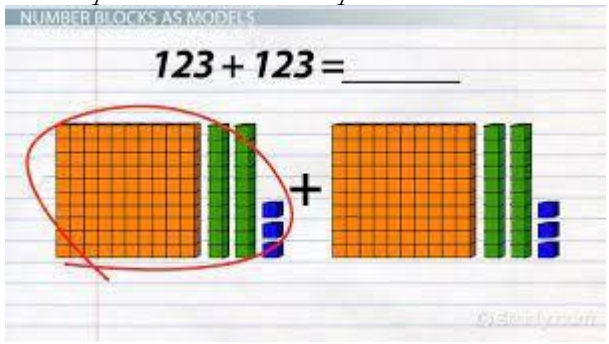
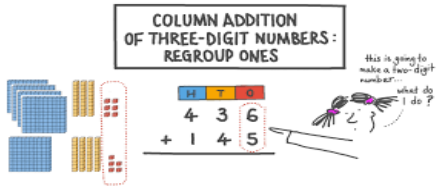
Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

Operation with number ELO O1.2

Introduction to the Subject:
Strand (Topic): ***Operations with Numbers***
Essential Learning Outcomes: O 1.2 ***Additive Thinking – Compute Fluently using Operations (+, –)***
Grade Level Expectations and/or Focus Questions: using place value and the properties of operations; Fluently add and subtract within 1000 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

Specific Curriculum Outcomes	**Inclusive Assessment Strategies**	**Inclusive Learning Strategies**
1. Explain relationship between the places (ones, tens, hundreds). 2.Use the commutative property of addition and the associative property to solve problems. 3.Understand the properties of zero in addition and subtraction 4.Subtract and Add three-digit numbers fluently using strategies based on place value. Describe the relationship between addition and subtraction, using one operation to check the other.	**SCO1** **Visual Representations:** ***Strategy:*** *Create visual representations like charts or diagrams.* ***Assessment:*** *Provide a chart with a number written in expanded form (e.g., 300 + 40 + 5) and ask students to identify the value of each place.* **Writing Numbers in Standard Form 100s Activity** Complete the tables below by writing the standard form of the numbers. 400 + 80 + 5 | 485 30 + 5 | 500 + 20 + 4 | 60 + 5 | (8 × 10) + 8 | 200 + 3 | *https://www.twinkl.co.uk/teaching-wiki/expanded-form*	**SCO1** Place Value Charts: *Strategy: Use visual aids like place value charts. Implementation: Display large place value charts in the classroom. Guide students in reading and interpreting numbers on the chart, emphasizing the position and value of each digit.* hundreds | tens | ones 3 | 6 | 9 300 | 60 | 9 *https://study.com/academy/lesson/how-to-write-numbers-in-expanded-form.html*

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	SCO2 **Real-Life Applications:** ***Strategy:*** *Integrate real-life scenarios.* ***Assessment:*** *Provide real-world situations where the order of adding numbers makes a difference or where grouping numbers differently yields the same result. Ask students to explain how the commutative and associative properties apply.* ***For example:*** ***Scenario: Baking Cookies*** ***Commutative Property:*** *Ask students to consider a recipe that calls for adding 2 cups of flour and 3 cups of sugar. Discuss how the order of adding these ingredients doesn't affect the total amount of dry ingredients.* ***Associative Property:*** *Present a scenario where the recipe involves combining 2 cups of flour and 3 cups of sugar first, and then adding an additional 4 cups of chocolate chips. Discuss how grouping the first two ingredients and adding the third yields the same result.* **SCO3** ***Open-Ended Questions:*** ***Strategy:*** *Pose open-ended questions.* ***Assessment:*** *Ask questions that require students to explain the properties of zero in their own words.* ***For example,*** *"Why does adding zero not change the quantity?" or "How does subtracting zero affect the number?"* **SCO4** ***Place Value Manipulatives:***	 *https://hotcore.info/babki/Place-Value-Standard-Form.htm* **SCO2** ***Commutative property*** (3 + 7 = 7 + 3 ***Associative property*** (2 + 5) + 8 = 2 + (5 + 8))  *https://www.youtube.com/watch?app=desktop&v=djqE15l6Nm0* **SCO3** **Real-Life Scenarios:** ***Example:*** *Share a scenario where a student has zero pencils and receives 6 more. Ask students to visualize and understand that the total number of pencils is 6. Similarly,*

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Strategy: *Provide base-ten blocks or other place value manipulatives.* ***Assessment:*** *Ask students to physically represent three-digit numbers using the manipulatives and then perform addition and subtraction. Observe their ability to regroup or decompose numbers based on place value.*  *https://study.com/academy/lesson/using-models-to-represent-numbers-operations.html* **SCO5** **Real-Life Application:** ***Strategy:*** *Incorporate everyday situations.* ***Example:*** *"Mark has $50. He spent $28 on a new toy. Use subtraction to find out how much money he has left. Now, use addition to check if Mark's spending and remaining money add up to the original $50."*	*discuss a scenario where a student has 9 cookies and gives away zero, leaving them with 9.* *Addition (6 + 0 = 6) subtraction (9 - 0 = 9).* **SCO4**  *https://www.nagwa.com/en/videos/316125638136/* **SCO5** **Manipulating Equations:** ***Strategy:*** *Manipulate equations to show relationships.* ***Implementation:*** *Given an equation like 15 + 8 = 23, students can rearrange it to 23 - 8 = 15, demonstrating how one operation can be used to verify the other.* **SCO6**

Additional Resources and Materials Manipulatives(counters) Number Line, Maths Worksheets, Maths Story Books, Educational Games (card games, board games, Multiplication Bingo, Math War, Online Math Games
Additional Useful Content Knowledge for the Teacher:

There are 4 basic operations in Mathematics : Addition, Subtraction, Multiplication and Division .
Addition is the inverse operation for Subtraction. 120 + 30 =150 (150– 120 =30) (150 – 30 =120)
Subtraction is the inverse operation for Addition. 187 –54=133 133+54= 187
Multiplication is the inverse operation for Division 5x4=20 20÷5=4 20÷4=5
Division is the inverse operation for Multiplication. 27÷3=9 9x3=27 3x9=27
Multiplication is repeated Addition. 6x4 is the same as 6 +6+6+6
Multiplication and Addition are Commutative. This means that the order in which you perform the operation does not change the answer.
Example: 8x7=56 7x8=56… 3+7+9=19 7+9+3=19
(Sum means to Add). (Difference means to Subtract). (Product means to Multiply). (Quotient means to Divide)
Multiplicand x Multiplier=Product Dividend ÷ Divisor= Quotient

Opportunities for Subject Integration:

Strategies that Support the Curriculum and Assessment Framework

Elements that are integrated across subjects:

Elements from Local Culture, Technology, TVET, Environment that are integrated:

Counting Games (Hop Scotch, Pick Pick, Marble playing)
Singing Multiplication Tables.
Sou Sou.
Schools Saving Union.

Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

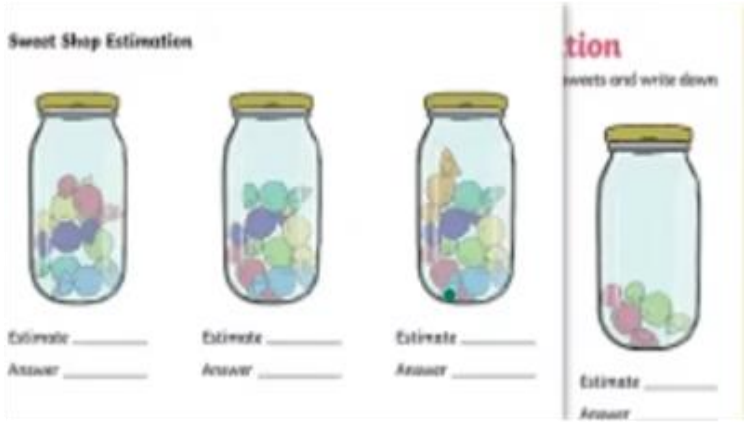
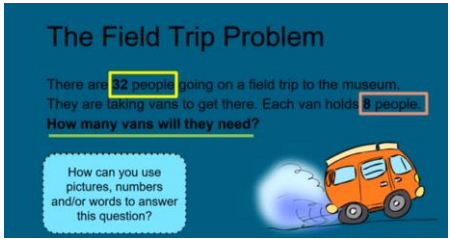
Operation with number ELO O 1.3

Introduction to the Subject: *Identifies purpose and goals of the subject area with links to the Vision and the Essential Education Competencies.*
Strand (Topic): ***Operation with numbers***
Essential Learning Outcomes: O 1.3: ***Additive Thinking – Make a Reasonable Estimation When Using Operations***
Grade Level Expectations and/or Focus Questions: ***Apply estimation strategies to predict sums and differences of 1-, 2-,and 3-digit numerals in a problem-solving context.***

Specific Curriculum Outcomes	**Inclusive Assessment Strategies**	**Inclusive Learning Strategies**
1. Round numbers with up to 3 digits to the nearest 10 and 100. 2. Estimate sums and differences quickly and efficiently, using rounding off. 3. Apply estimation strategies (number lines, rounding, compatible numbers) to real-world problems (shopping, measuring) that require the prediction of sums and differences. 4. Explain and justify the chosen estimation method when predicting sums and differences. 5. Evaluate the reasonableness of estimates by comparing them to the actual sums and differences. 6. Develop an understanding of the purpose/importance of estimation	**SCO 1** **Written Assessments:** *Provide a written assessment with a mix of rounding problems to the nearest 10 and 100. Accommodate students with different abilities by including both straightforward and more challenging questions.* ***Rounding to the Nearest 10:*** *Round 74 to the nearest 10.* ***Rounding to the Nearest 100:*** *Round 697 to the nearest 100.* ***Mixed Rounding Problems:*** *Round 49 to the nearest 10 and then round the result to the nearest 100.* *Round 186 to the nearest 100 and then round the result to the nearest 10.* ***Practical Application:***	**SCO 1** **Concrete Manipulatives:** Use physical objects or number lines to demonstrate rounding. For example, provide students with physical base-10 blocks and show them how to round by physically moving the blocks. *https://youtu.be/zu6UKldmk7A?si=7zyCkexcBgMIgZxG* *https://youtu.be/bx-XKcgKqzc?si=ctZkrgnKsHrC2kDe* **SCO 2** **Storytelling:** *Create stories or word problems that require students to use rounding to estimate sums and differences. This helps connect the concept to a narrative, making it more memorable.* ***Sample Stories***

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
of sums and differences in solving real-world problems.	*There are 348 books in a library. Round this number to the nearest 100. How many hundreds are there?* *You have 473 stickers. Round this number to the nearest 100. How would you say this number after rounding?* **SCO 2** **Choice-Based Assessments:** *Offer students the choice of assessment formats (e.g., written test, oral presentation, digital quiz) to accommodate their preferred learning and assessment styles.* **SCO 3** **Real World Word Problems** Present students with real-world word problems that involve adding or subtracting 1-, 2-, and 3-digit numbers. Ask them to estimate the answer before solving the problem and explain their estimation strategy. *For example, "Estimate the total cost of buying a toy for $25 and a book for $12.* **SCO 4** **Open-Ended Questions:** *Include open-ended questions in assessments that require students to explain the estimation method they used and justify why they chose it.* ***Sample Questions***	**1. *Road Trip Adventure:*** *The Johnson family is planning a road trip. They estimate that they will drive 245 miles to their first stop and then 178 miles to their next stop. Round these distances to the nearest 10 miles to get an approximate total driving distance.* *2.* ***Baking Cookies:*** *Sarah is baking cookies for a school event. She has 2 bags of chocolate chips, one with 425 grams and the other with 360 grams. To estimate the total amount of chocolate chips she has, round each bag's weight to the nearest 100 grams.* **3. Soccer Game Excitement:** In a football game, the home team scored 48 goals, and the visiting team scored 52 goals. To estimate the difference in the number of goals, round both numbers to the nearest ten. About how many more goals did the visiting team score? **SCO 3** **Role-Playing Scenarios:** ***Strategy:*** *Engage in role-playing activities.* ***Implementation:*** *Create scenarios where students take on roles in a shopping or measuring context. They can estimate quantities, negotiate prices, and discuss their decision-making process. For example* ***Culinary Creations:*** ***Scenario:*** *Aspiring chefs, students plan a cooking adventure. They take on the role of shoppers, estimating ingredient quantities for a recipe. This involves measuring ingredients like flour, sugar, and spices, as well as estimating costs when shopping for the items.* **SCO 4** **Real-World Context:**

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	1. Explain how you estimated the sum of 58 and 36, and the reason for using such a strategy. **SCO 5** **Real-World Problem Solving:** *Present students with real-world scenarios where they need to estimate and calculate sums and differences. Afterward, ask them to reflect on the reasonableness of their estimates and compare them to the actual results.* **SCO 6** **Class Discussions:** Organize class discussions where students can share their experiences using estimation in everyday life. Encourage them to explain how estimation helps them to make quick decisions and solve problems efficiently.	*Present estimation problems based on real-world scenarios, such as shopping, where students must not only estimate but also explain why they chose a specific strategy.* ***Sample Scenario*** ***Pet Adoption Event:*** *You're at a pet adoption event, and there are 24 dogs and 15 cats looking for homes. Estimate the total number of animals at the event, and explain your rounding strategy.* **SCO 5** **Comparative Tasks:** *Present students with a set of estimation problems, and have them estimate the answers. After which, instruct them to calculate the actual sums and differences, and compare them to their estimates and reflect on the reasonableness.* **SCO 6** **Group Projects:** Assign group projects that require students to apply estimation in practical scenarios. Ask them to discuss the role of estimation in solving these problems and present their findings to the class.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		 https://www.twinkl.com.au/resource/t-n-6168-sweet-shop-estimation-activity-sheet **Sample Group Projects** 1. **Travel Adventure:** Have students plan a pretend family vacation, including choosing a destination, estimating travel costs, and planning daily activities. They discuss how estimation influenced their choices and present their vacation plans to the class for example:  https://youtu.be/UPpZI-JZMmc 0. **Room Redesign Project**

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		Each group is given a task to put an estimate together to redesign the classroom. They have to estimate the cost of the new furniture, paint and decorations. Groups will present their estimates, explaining how estimation played a role in planning and budgeting for the room design.

Additional Resources and Materials

(Additional material and resources that are not included in the Inclusive Learning and/or Inclusive Assessment Strategies that may be useful for lesson planning)

Additional Useful Content Knowledge for the Teacher:

1. **Understanding Place Value:**
    - Recognizing the value of digits in 1-, 2-, and 3-digit numbers.
    - Understanding the relationship between units, tens, and hundreds.
    - Knowing how the position of a digit affects its value.
2. **Rounding Skills:**
    - Rounding 2- and 3-digit numbers to the nearest 10 and 100.
    - Recognizing the impact of rounding on the magnitude of a number.
3. **Addition and Subtraction Fluency:**
    - Fluently adding and subtracting 1-, 2-, and 3-digit numbers.
    - Understanding the properties of addition and subtraction.
4. **Estimation Strategies:**
    - **Front-End Estimation:** Understanding that estimation can be done by focusing on the leftmost digit in addition or subtraction.
        - Example: Estimating 348 + 125 by rounding to 300 + 100 = 400.
    - **Compatible Numbers:** Identifying numbers that are easy to work with mentally.
        - Example: Estimating 167 + 89 by rounding to 170 + 90 = 260.
    - **Number Line Estimation:** Using number lines to visually estimate the position of numbers and their sums or differences.
        - Example: Estimating the difference between 427 and 318 on a number line.
5. **Word Problem Solving:**
    - Translating real-world scenarios into mathematical expressions.
    - Understanding when estimation is appropriate and helpful in problem-solving.
6. **Contextual Understanding:**

- Applying estimation strategies in various contexts such as shopping, measuring, or planning activities.
- Recognizing situations where estimation can be used to make quick predictions.

7. **Critical Thinking:**
   - Analyzing whether the estimated result is reasonable based on the context.
   - Reflecting on the impact of estimation on the accuracy of predictions.
8. **Communication Skills:**
   - Expressing estimation strategies and reasoning clearly.
   - Justifying the choice of estimation method in problem-solving.
9. **Comparing Estimates:**
   - Comparing estimated sums or differences to identify the most reasonable prediction.
   - Understanding when to adjust estimates based on the problem context.
10. **Practical Application:**
    - Applying estimation skills to real-life situations, such as estimating the total cost of items, predicting travel times, or planning events.
11. **Error Analysis:**
    - Recognizing common errors in estimation and correcting them.
    - Learning from mistakes to improve estimation skills.
12. **Understanding Limits:**
    - Recognizing the limitations of estimation and when precise calculations are necessary.
    - Developing a sense of when rough estimates are sufficient for a given problem.

Opportunities for Subject Integration: *(Additional ideas about how the inclusive learning strategies might be adapted and/or applied to include other subjects in the curriculum)*

Strategies that Support the Curriculum and Assessment Framework

This section is optional and intended to assist writers as they check the curriculum to the Curriculum and Assessment Framework. It can be used at the discretion of the Team Leads and PICT Subject Specialists. It will be used to guide the writing but will not appear in the curriculum guides.

Elements that are integrated across subjects:

Language Arts:
Activity: Write and Solve Word Problems
Integration: Have students write word problems that involve estimating and solving sums or differences. This not only reinforces math skills but also enhances language arts and critical thinking.
Science:
Activity: Measurement Estimation

Integration: Integrate science by having students estimate and measure lengths, weights, or volumes. They can predict the results of scientific experiments involving measurements.
Social Studies:
Activity: Budgeting for a Project
Integration: Integrate social studies by having students plan and budget for a class project. They estimate costs, predict the total budget, and analyze the financial implications of their decisions.
Art:
Activity: Creating Symmetrical Designs
Integration: Combine math and art by having students estimate and create symmetrical designs. They can predict the number of shapes needed on one side to create a balanced design.
Physical Education:
Activity: Estimating Distance in Sports
Integration: Apply estimation to physical education by having students estimate distances in various sports activities. This promotes spatial awareness and mathematical reasoning.
Music:
Activity: Rhythmic Estimation
Integration: Integrate music by having students estimate and create rhythmic patterns. They can predict the duration of musical notes and create their compositions.
Physical Education:
Activity: Estimating Fitness Goals
Integration: Integrate physical education by having students set fitness goals. They estimate the time or distance for activities

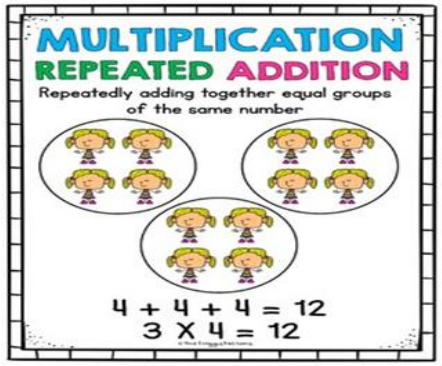
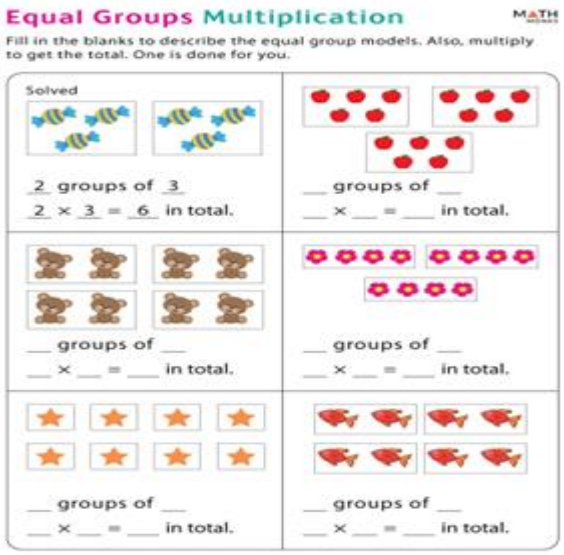
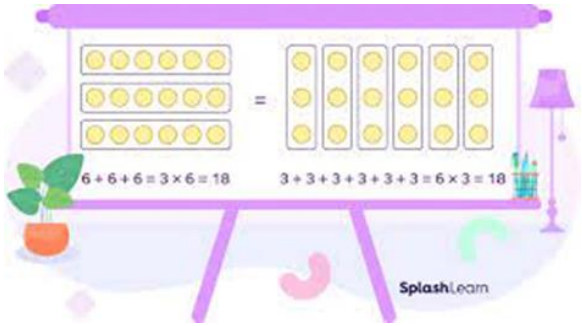
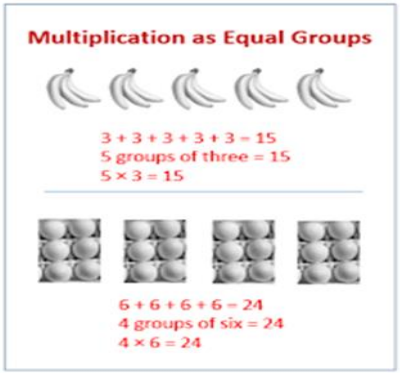
Elements from Local Culture, Technology, TVET, Environment that are integrated:

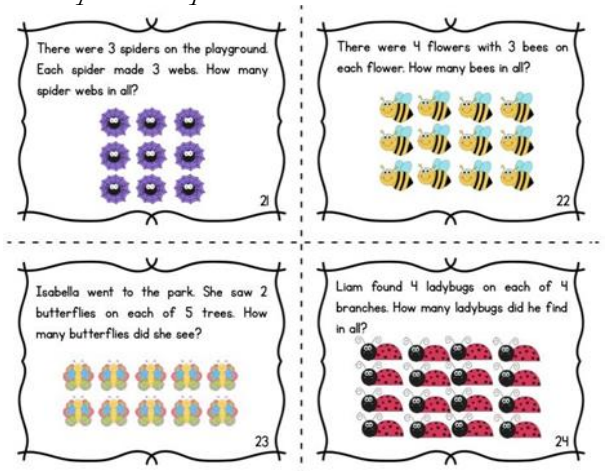
Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

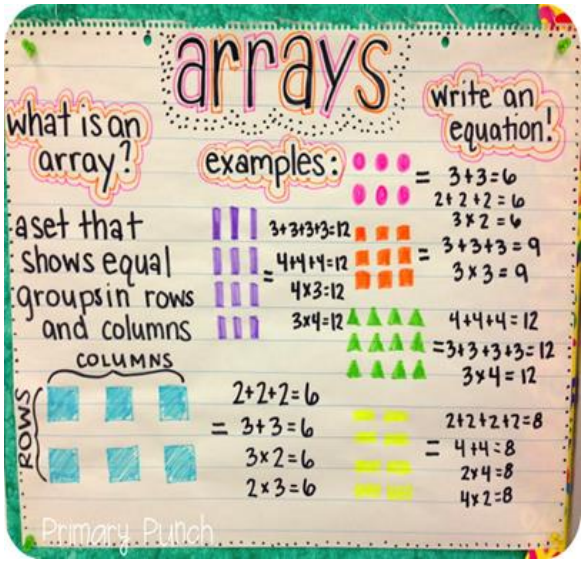
Operation with numbers ELO O2.1

Introduction to the Subject: *Identifies purpose and goals of the subject area with links to the Vision and the Essential Education Competencies.*
Strand (Topic): Operations with Numbers
Essential Learning Outcomes: O *2.1 Multiplicative Thinking – Understanding the Meaning of Multiplication and Division and How They Relate*
Grade Level Expectations and/or Focus Questions*: Represent multiplication using equal groups and arrays; Represent division using equal sharing and equal grouping, Interpret products of whole numbers,*

Specific Curriculum Outcomes	**Inclusive Assessment Strategies**	**Inclusive Learning Strategies**
Represent Multiplication using Equal Groups and Arrays: 1. Understand and demonstrate the concept of multiplication as repeated addition. 2. Represent multiplication using equal groups. 3. Represent multiplication using arrays. 4. Solve word problems involving equal groups and arrays. **Represent Division using Equal Sharing and Equal Grouping**	**SCO 1 and 2** **Manipulatives and Hands-On Activities:** ***Strategy:*** *Provide concrete objects (counters, cubes, etc.) for students to physically group and count.* ***Example Assessment:*** *Ask students to represent multiplication problems using manipulatives and then explain their process orally or through drawing.* ***Example Activity:*** *Use counters or objects to show 3 groups of 4 and express it as 3 x 4 = 12.*	**SCO1 and 2** **Visual Aids and Graphic Organizers:** ***Strategy****: Provide visual support through charts, diagrams, and graphic organizers.* ***Example Activity****: Create a multiplication chart together, illustrating the relationship between multiplication and repeated addition. Use visual cues to reinforce the concept.*

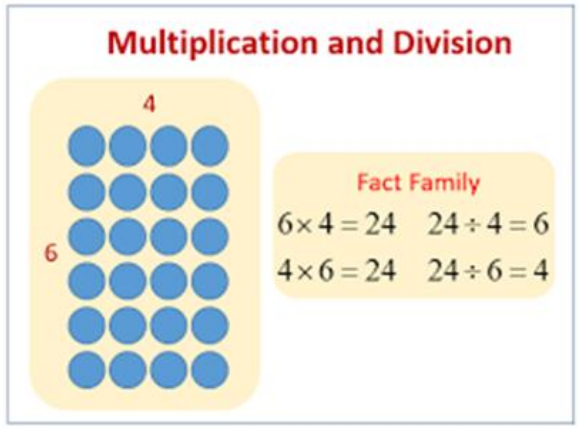
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
5. Understand division as sharing into equal groups. 6. Represent division using equal grouping. 7. Solve word problems involving equal sharing and grouping. **Interpret Products of Whole Numbers:** 8. Interpret products in real-world contexts. 9. Relate multiplication and division.	 *https://www.teacherspayteachers.com/Product/Multiplication-as-Repeated-Addition-Equal-Groups-Worksheets-5097465* 	 *https://www.splashlearn.com/math-vocabulary/algebra/repeated-addition*  *https://www.onlinemathlearning.com/equal-groups-multiplication.html*

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	https://mathmonks.com/worksheets/equal-groups-multiplication-worksheets **SCO 3 and 4** **Real-World Array Scenarios:** ***Strategy:*** *Frame multiplication as real-life scenarios requiring arrays.* ***Example Assessment****: Present problems related to arranging objects in arrays for practical situations, such as setting up chairs in a classroom. Students can draw and explain their arrays.* ***Example Activity:*** *Given a problem, create a visual representation using equal groups or arrays, and then write a multiplication equation to solve it.* 	**SCO3** **Real-Life Scenarios:** ***Strategy:*** *Relate array representation to real-world scenarios.* ***Example Activity:*** *Pose multiplication problems related to real-life situations and ask students to represent them using arrays.* *Anna has many different types of chocolate in a box. There are 5 rows with 6 chocolates in each row. How many chocolates does Anna have altogether?*

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	http://wps123.weebly.com/arrays.html **SCO 5, 6 and 7** **Open-Ended Questions:** ***Strategy:*** *Pose open-ended questions to encourage critical thinking.* ***Example Assessment:*** *Ask students to create their own division problems involving equal sharing and represent the solutions using various methods.* ***Drawing:*** *Create a visual representation of the sharing process.* ***Manipulatives:*** *Use counters, small objects, or other manipulatives to physically demonstrate the division.* ***Written Expression:*** *Write out the division equation and solution.* ***Technology:*** *Utilize digital tools or educational apps to represent the division problem.* **SCO8** **Interactive Role-Play:**	 http://msmason29.weebly.com/arrays--multiplication.html **5 rows of 6=30** **5x6=30**

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Strategy: *Engage students in interactive role-play scenarios.* ***Assessment Activity:*** *Set up role-play stations where students act out real-world situations that involve multiplication. Observe their understanding as they interpret products in the context of the role-play. For example* ***Grocery Store Multiplication:*** ***Setup****: Create a mini grocery store in the classroom with play food items and price tags.* ***Role-play Scenario:*** *Students take turns playing the roles of shoppers and cashiers. Each item has a price, and students act out buying multiple items. They calculate the total cost using multiplication.* **SCO 9** **Story Mapping:** ***Strategy:*** *Utilize story mapping techniques to connect multiplication and division in a narrative context.* ***Assessment Activity:*** *Provide a story where multiplication is initially used to combine items, followed by a division scenario where those items are shared or distributed. Ask students to create a story map or timeline to illustrate these mathematical connections. For example*	 *https://www.thoughtco.com/definition-of-arrays-in-mathematics-2312362* **SCO 5, 6 and 7** **Open-Ended Questions:** ***Strategy:*** *Pose open-ended questions to encourage critical thinking. For example* ***Application of Equal Sharing:*** ***Question:*** *Imagine you have a collection of 20 marbles. How would you share them equally among 4 friends? What strategies could you use to represent this division?*

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Bake Sale Bonanza: ***Scenario:*** *A group of students is organizing a bake sale. They want to bake trays of cookies to sell. Each tray can hold 8 cookies, and they plan to make 5 trays.* ***Story Mapping:*** *Draw a rectangle to represent the baking trays.* *Label each tray with the number 5 (5 trays).* *In each tray, draw 8 cookies to represent the multiplication (5 trays × 8 cookies).* *Discuss how they might later want to divide the total number of cookies equally to package them for sale.*	***Drawing Equal Groups:*** ***Question:*** *Draw a picture to represent the division problem: 18 ÷ 3. Explain your drawing and how it represents equal sharing.* ***Exploring Strategies:*** ***Question:*** *What are different ways you can group 24 objects into equal groups? How does the method you choose impact the division equation***?** **SCO8** **Role-Playing:** ***Strategy:*** *Engage in role-playing activities* **Choose Real-Life Scenarios:** *Select scenarios that reflect everyday situations where multiplication is used in real life. Examples include shopping, sharing items, or planning events. Ensure the scenarios are relatable to Grade 3 students.* **Provide Clear Instructions:**

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		Clearly explain the roles, the scenario, and the multiplication context. Make sure students understand their objectives and the expected outcomes of the role-playing activity. **SCO 9** **Story Mapping:** ***Field Trip Fun:*** ***Scenario:*** *A class is going on a field trip, and they need to arrange transportation. Each minibus can carry 6 students, and they have a total of 4 minibuses.*  *https://www.onlinemathlearning.com/division-models.html*

Additional Resources and Materials

(Additional material and resources that are not included in the Inclusive Learning and/or Inclusive Assessment Strategies that may be useful for lesson planning)

Manipulatives and Hands-On Materials:

Counters, buttons, small toys, or any small, tangible objects can be used for hands-on division activities. Fraction circles or fraction strips for representing division involving fractions.

Math Worksheets and Printables:

Educational websites and platforms like Education.com, Super Teacher Worksheets, and K5 Learning offer printable worksheets and division practice exercises for various grade levels.

Interactive Math Apps and Games:

Educational apps and online games can engage students while reinforcing division concepts. Consider apps like "Math Bingo" or online resources like Coolmath Games.

Textbooks and Workbooks: Look for math textbooks and workbooks specifically designed for your grade level or curriculum. These often include division lessons and practice problems.

Visual Aids and Posters:

Create or purchase posters that illustrate division concepts, equal sharing, and equal grouping methods. Visual aids can enhance understanding.

Online Video Tutorials:

Platforms like Khan Academy, YouTube, and LearnZillion offer video tutorials on division concepts, providing step-by-step explanations and examples.

Virtual Manipulatives:

Websites like the National Library of Virtual Manipulatives offer free virtual math manipulatives that can be used for division activities.

Math Apps for Accessibility:

Explore math apps and software designed for accessibility, such as "MathTalk" or "MathType," which provide support for students with disabilities.

Math Storybooks:

Incorporate math-themed storybooks that introduce division concepts in a fun and relatable way. "The Doorbell Rang" by Pat Hutchins is one such book.

Math Board Games:

Board games like "Fraction Bingo," "Math Jeopardy," or "Division War" can make learning division enjoyable for students.

Teacher-Generated Materials:

Create your own division worksheets, flashcards, and teaching materials tailored to your students' needs and curriculum.

Math Software Programs:

Educational software programs like Mathletics, DreamBox, or ST Math often include division modules and adaptive learning features.

Online Problem Solving Platforms:

Platforms like IXL, Math Playground, and Prodigy offer online practice problems and interactive division challenges.

Educational Websites:

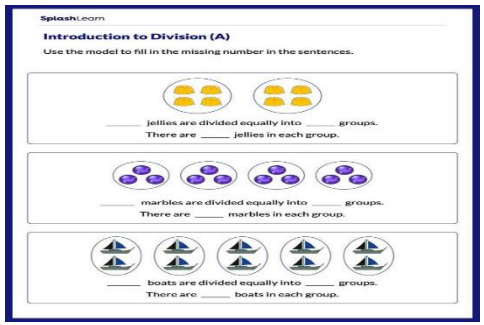
Explore educational websites like Illuminations (from the National Council of Teachers of Mathematics) or Math Is Fun for division tutorials, lessons, and interactive activities.

Math Apps for Special Needs:

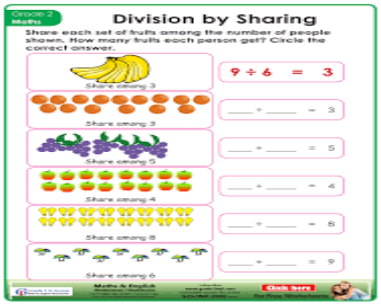
Apps like "Mathway" or "ModMath" are designed to support students with dyscalculia and other learning challenges in mastering math concepts, including division.

Additional Useful Content Knowledge for the Teacher: (*any additional knowledge that the writers believe would be helpful for the teacher such as reading material at a lower or higher grade level, links to curriculum documents for other grades)*

When grouping, the quotient represents the amount of groups within the shared quantity



Equal shares refer to dividing the whole or a group of objects into equal parts.



Opportunities for Subject Integration: *(Additional ideas about how the inclusive learning strategies might be adapted and/or applied to include other subjects in the curriculum)*

Science:

Measurement and Data Analysis: Use division to analyze and interpret scientific data, such as calculating the average temperature, speed, or density.

Life Sciences: Explore division when studying population growth, genetics, or ecological interactions, as it can help understand rates and proportions in biology.

Social Studies:

Geography: Apply division to calculate population density, land distribution, and resources per capita in different regions or countries.

History: Use division to analyze historical data, such as population growth over time or economic trends.

Language Arts:

Word Problems: Incorporate division word problems related to literature or historical events, challenging students to apply division concepts in context.

Writing: Have students write explanatory essays or reports that involve division as a supporting mathematical concept.

Art:

Geometry: Explore the geometric aspects of division, such as dividing shapes into equal parts, which can lead to discussions about symmetry and patterns in art.

Scale: Introduce division when scaling up or down in art projects, like enlarging a drawing or creating a mosaic.

Physical Education:

Statistics: Apply division to analyze sports statistics, such as calculating batting averages, team scores, or the average speed of runners.

Health and Nutrition: Use division to explore topics like portion control and nutrient distribution in meal planning.

Music:

Rhythm and Timing: Incorporate division concepts when discussing musical rhythms, time signatures, and beats per minute in music theory.

Budgeting: Use division to teach financial literacy, including budgeting and managing money.

Civics and Government:

Voting and Representation: Explore the concept of division in terms of voting districts, congressional representation, and fair political representation.

Foreign Languages:

Language Learning: Create division problems that involve dividing foreign currency, measuring time zones, or sharing items among speakers of different languages.

Strategies that Support the Curriculum and Assessment Framework

This section is optional and intended to assist writers as they check the curriculum to the Curriculum and Assessment Framework. It can be used at the discretion of the Team Leads and PICT Subject Specialists. It will be used to guide the writing but will not appear in the curriculum guides.

Elements that are integrated across subjects:

Elements from Local Culture, Technology, TVET, Environment that are integrated:

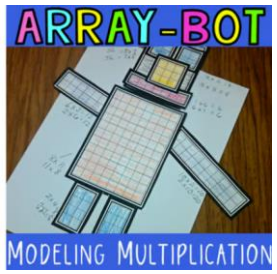
Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

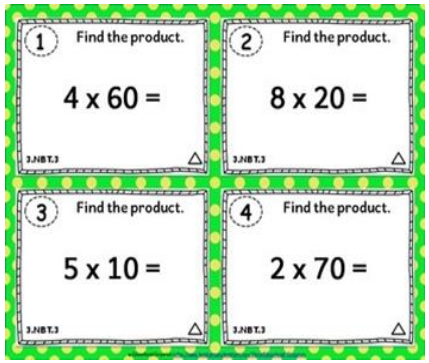
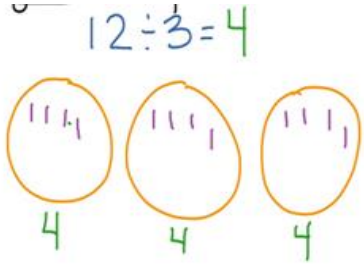
Operation with number ELO O2.2

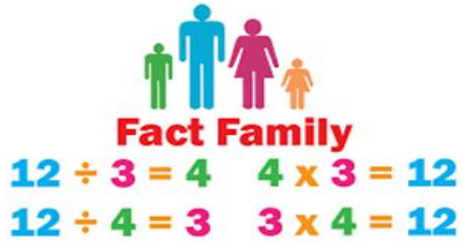
Introduction to the Subject: *Identifies purpose and goals of the subject area with links to the Vision and the Essential Education Competencies.*
Strand (Topic): Operations with Numbers
Essential Learning Outcomes: ***2.2 Multiplicative Thinking – Compute Fluently with Operations (x&÷)***
Grade Level Expectations and/or Focus Questions: *Use multiplication and division facts (products within 100) to solve word problems in situations involving equal groups, arrays, combinations, and measurement quantities,*

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Specific Curriculum Outcomes 1. Use multiplication and division facts (products within 100) to solve word problems in situations involving equal groups, arrays, combinations, and measurement quantities. 2. Understand division as an unknown-factor problem. 3. Multiply one-digit whole numbers by multiples of 10 in the range 10–90. 4. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division.	**Inclusive Assessment Strategies:** **SCO 1** **Real-World Problem-Solving Stations:** ***Strategy:*** *Set up stations with real-world scenarios that require multiplication and division.* ***Assessment Activity:*** *Students rotate through stations where they encounter word problems related to equal groups, arrays, combinations, and measurement quantities. They solve the problems using multiplication and division and explain their reasoning. For example* ***Equal Groups Station: Grocery Store Checkout*** ***Setup:*** *Create a "Grocery Store Checkout" station with pictures of grocery items and their prices. Each student is*	**Inclusive Learning Strategies:** **SCO 1** **Interactive Math Games Station:** ***Objective:*** *Reinforce multiplication and division concepts through interactive games.* ***Setup:*** *Provide stations with math games that involve equal groups, arrays, and combinations. Students can play games that allow them to practice these concepts in a digital and engaging way. For example* ***Equal Groups Game Station: "Sharing Cookies"*** ***Objective:*** *Reinforce equal sharing concepts.*

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	given a shopping list with quantities, and they need to calculate the total cost for different items using multiplication (equal groups). ***Word Problem Example:*** *If apples cost $2 per pound, and the shopping list says to buy 4 pounds of apples, how much will they cost in total?* ***Arrays Station: Building Block Arrays*** ***Setup:*** *Set up a "Building Block Arrays" station with building blocks or tiles. Students use the blocks to create arrays and solve multiplication word problems.* ***Word Problem Example:*** *If there are 3 rows of building blocks, and each row has 5 blocks, how many blocks are there in total?* ***Measurement Quantities Station: Aquarium Design*** ***Setup:*** *Set up an "Aquarium Design" station where students design aquariums with different fish tanks. They calculate the total volume of water needed for each aquarium using multiplication.* ***Word Problem Example:*** *If each fish tank needs 10 liters of water, and there are 5 tanks, how much water is needed in total?* ***Equal Sharing Station: Cookie Jar Division***	***Setup:*** *Students play a digital game where they distribute cookies equally among characters. The game provides scenarios where they need to divide a certain number of cookies among a specified number of friends or characters.*  *https://deceptivelyeducational.blogspot.com/2012/04/sharing-cookies-division-by-grouping.html* ***Array Builder Station: "Robot Factory"*** ***Strategy: Game*** Allow students to b*uild arrays to assemble robots.* ***Setup:*** *Students play a game where they are in charge of building robots using arrays. They need to calculate the total number of robot parts needed based on the rows and columns of each array.*

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Setup: *Place a jar of cookies and small plates at the station. Students read word problems related to equal sharing and use cookies to physically demonstrate division.* ***Word Problem Example:*** *If there are 12 cookies in the jar, and they need to be shared equally among 4 friends, how many cookies will each friend get?* **SCO 2** **Word Problem Scenarios:** ***Strategy:*** *Present diverse real-life scenarios as word problems.* ***Assessment Activity:*** *Provide word problems where students need to figure out an unknown factor in division. For example: "There are 16 candies. If they are distributed equally into 2 bags, how many candies are in each bag?"* Fill in the blanks to describe the model.  There are 16 dots divided into 2 equal groups There are ____ dots in each group. So, 16 ÷ 2 = ____.	 *https://www.teacherspayteachers.com/Product/Array-Multiplication-Activity-3rd-4th-Grades-Math-Center-Array-Bot-Robot-321717?st=3a76212b73f8a266725eab7a37b1a219* **SCO2** **Real-Life Applications:** ***Strategy:*** *Connect division to practical situations.* ***Implementation:*** *Relate division with real-life scenarios that Grade 3 students can understand, such as sharing toys, distributing candies, or dividing fruits equally among family members. For example* ***Dividing Fruits among Family Members:*** ***Scenario:*** *The Johnson family has 12 apples, and they want to divide them equally among the 3 family members. How many apples will each family member get?*

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	https://www.ixl.com/math/grade-3/write-division-sentences-for-groups **SCO3** **Storytelling and Word Problems:** ***Strategy:*** *Frame multiplication problems within stories.* ***Assessment Activity:*** *Present multiplication problems in the form of relatable stories. For instance, "If there are 8 baskets, and each basket has 40 apples, how many apples are there in total?" This aids in understanding the context of the problem.*  *https://www.teacherspayteachers.com/Product/3NBT3-Task-Cards-Multiply-by-Multiples-of-10-3rd-Grade-Math-Centers-2816448* **SCO4** **Real-World Application Problems:**	***Connection:*** *This real-life scenario represents a division problem where the total number of apples (12) is divided equally among the number of family members (3).*  *https://www.showme.com/sh?h=MkwbdXk* **SCO3** **Storytelling Scenarios*:*** ***Strategy:*** *Frame multiplication as a story.* ***Example:*** *Multiply 5 by 80.* ***Solution:*** *Tell a story like "There are 5 boxes, and each box contains 80 chocolates. How many chocolates are there in total?" Students can relate to the story and understand the concept.* *5x80=400* **SCO4**

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Strategy: *Connect to practical situations.* ***Assessment Activity:*** *Present problems related to real-world scenarios where students need to use both multiplication and division within 100. For example, calculating the total cost of 8 items if each item costs $12 (8 × 12=96) and finding the cost per item if the total cost is $96 (96 ÷ 8=12).*	**Multiplication and Division Fact Families:** ***Strategy:*** *Emphasize fact families.* ***Activity:*** *Present fact families like 4 × 6 = 24, 6 × 4 = 24, 24 ÷ 4 = 6, and 24 ÷ 6 = 4. Discuss how multiplication and division are inverse operations.*  *https://www.rocketmath.com/2022/04/06/mult-division-fact-families-from-21/*
Additional Resources and Materials *(Additional material and resources that are not included in the Inclusive Learning and/or Inclusive Assessment Strategies that may be useful for lesson planning)* Apps like "Mathway" or "ModMath" are designed to support students with dyscalculia and other learning challenges in mastering math concepts, including division.		

Additional Useful Content Knowledge for the Teacher: (*any additional knowledge that the writers believe would be helpful for the teacher such as reading material at a lower or higher grade level, links to curriculum documents for other grades)*

Multiplication Facts within 100:

Fluency in multiplication facts up to 10 × 10.

Understanding the commutative property of multiplication (e.g., 3 × 4 = 4 × 3).

Division Facts within 100:

Fluency in division facts related to multiplication facts within 100.
Understanding the relationship between multiplication and division.
Equal Groups:
Identifying and forming equal groups in a given context.
Relating equal groups to multiplication (e.g., 3 groups of 4 equals 3×4).
Arrays:
Understanding arrays as an arrangement of objects in rows and columns.
Relating arrays to multiplication (e.g., 3 rows of 4 equals 3×4).
Combinations:
Recognizing different combinations of numbers.
Understanding how combinations can be represented using multiplication (e.g., $2 \times 6 = 12$ and $6 \times 2 = 12$).
Measurement Quantities:
Applying multiplication to solve problems related to measurement quantities.
Understanding units of measurement and how they relate to multiplication (e.g., 5 meters $\times$ 4 equals 20 meters).
Problem Solving:
Translating real-world situations into multiplication and division expressions.
Identifying the operation (multiplication or division) needed to solve a specific problem.
Multiplication as Repeated Addition:
Understanding multiplication as a shortcut for repeated addition.
Relating repeated addition to equal groups and arrays.
Division as Sharing into Equal Groups:
Understanding division as a way to share a quantity into equal groups.
Relating division to the concept of fair sharing.
Application of Inverse Operations:
Understanding the inverse relationship between multiplication and division.
Using multiplication to solve division problems and vice versa.
Multi-Step Problem Solving:
Solving multi-step word problems that involve both multiplication and division.
Sequencing steps logically to arrive at a solution.
Estimation Skills:
Estimating products and quotients to check the reasonableness of answers.
Using estimation as a tool for problem-solving.
Mathematical Vocabulary:
Developing and using mathematical vocabulary related to multiplication and division (e.g., product, quotient, factor).
Representation Skills:

Representing multiplication and division problems using models, drawings, or equations.
Interpreting different representations of multiplication and division in word problems.

Opportunities for Subject Integration: *(Additional ideas about how the inclusive learning strategies might be adapted and/or applied to include other subjects in the curriculum)*

Strategies that Support the Curriculum and Assessment Framework

This section is optional and intended to assist writers as they check the curriculum to the Curriculum and Assessment Framework. It can be used at the discretion of the Team Leads and PICT Subject Specialists. It will be used to guide the writing but will not appear in the curriculum guides.

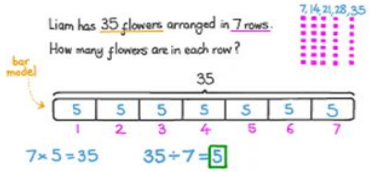
Elements that are integrated across subjects:

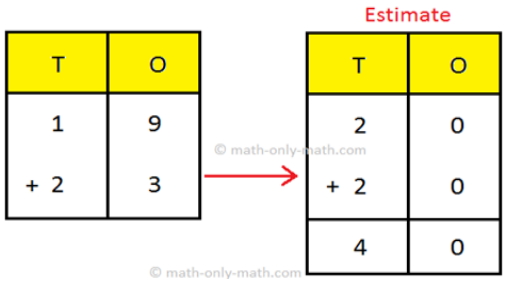
Elements from Local Culture, Technology, TVET, Environment that are integrated:

Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

Operation with number ELO O2.3

Introduction to the Subject: *Identifies purpose and goals of the subject area with links to the Vision and the Essential Education Competencies.*
Strand (Topic): *Identify as a Strand which may have sub-component that will be reflected in the Specific Curriculum Outcomes*
Essential Learning Outcomes: O2.3 Multiplicative Thinking-Make Reasonable Estimation When Using the Four Basic Operations
Grade Level Expectations and/or Focus Questions: Solve word problems using the four basic operations.

Specific Curriculum Outcomes	**Inclusive Assessment Strategies**	**Inclusive Learning Strategies**
1. Solve a variety of word problems involving addition, subtraction, multiplication, and division within a given context. 2. Interpret word problems, identify the operations required to solve them, and apply the appropriate mathematical processes. 3. Represent word problems using equations with a variable to denote the unknown quantity. 4. Assess the reasonableness of their answers using mental computation. 5. Use estimation strategies, including rounding, to check the reasonableness of their answers. 6. Apply the four operations to solve multi-step word problems.	**SCO1 & 2** **Open-Ended Questions:** ***Strategy:*** *Allow students to explain their reasoning.* ***Example:*** *"Tom has 35 marbles. He wants to distribute them equally into 5 bags. Describe how you would solve this problem and find the number of marbles in each bag."* **SCO3** **Peer Teaching and Collaboration:** ***Strategy:*** *Promote collaboration and peer teaching.*	**SCO1 & 2** **Strategy : Problem Solving** ***Problem:*** *Jack has 35 marbles. He wants to share them equally among 7 friends. How many marbles will each friend get? Student this problem using two different strategy.* ***Solution:*** *35÷7=5* ***Answer:*** *Each friend will get 5 marbles.*  *https://www.nagwa.com/en/videos/340104907542/*

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Assessment Activity: *Assign pairs of students to work together. One student creates a word problem, and the other represents it with an equation. They then switch roles, providing an opportunity for collaboration and understanding. For example* *"If there are 5 boxes, and each box has x apples, how many apples in total?" Students can draw five boxes with an 'x' inside each.* **SCO4 and 5** **Estimation by rounding** ***Example:*** *Estimate the answer to the problem "There are 37 students in a class. If each student gets 8 pieces of paper, how many pieces of paper are needed?" by rounding 37 to 40 and 8 to 10.* **Open-Ended Estimation Questions:** ***Strategy:*** *Use open-ended questions to assess estimation skills.* ***Assessment Activity:*** *Pose questions that require students to estimate and explain their reasoning. For instance, "Estimate the total cost of three items priced at $8.75, $6.50, and $4.25. Explain how you rounded to make your estimate."* **SCO6**	**SCO3** **Peer Collaboration and Discussion:** ***Strategy:*** *Encourage peer collaboration.* ***Activity:*** *Assign pairs or small groups of students to discuss and represent word problems together. This allows for collaborative learning and the exchange of different perspectives.* *"In a zoo, there are 6 cages, and each cage has x monkeys. How many monkeys in total?"* *6 x x=total monkeys* **SCO4 AND 5** **Estimation by rounding off**  https://www.math-only-math.com/estimating-a-sum.html ***For example,*** *let us estimate the following sums:*

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Multi-Step problem *Example: Solve the multi-step problem "A store sells bags of oranges for $5 each. If Sarah buys 3 bags and pays with a $20 bill, how much change should she receive?"* ***Real-Life Scenario Projects:*** ***Strategy:*** *Engage students in real-life scenario projects.* ***Assessment Activity:*** *Assign a project where students need to solve multi-step word problems related to everyday situations. For example, planning a party or organizing a school event involves multiple steps that require different operations.*	*47 + 32* *We need to round the number to the nearest 10.* *47 → 50* *32 → 30* *50 + 30 = 80* **SCO6** **Real-Life Context Exploration:** ***Strategy:*** *Explore various real-life contexts.* ***Implementation:*** *Introduce multi-step word problems in different real-life contexts, exposing students to diverse scenarios. This can include financial situations, scientific experiments, or daily activities, allowing for a broad understanding of problem-solving applications.*  MULTIPLICATION WORD PROBLEMS SALAMANDER SPORTS DAY *Use your multiplication table to help you solve these problems.* 1) Tyger Salamander has a skipping rope 5ft long. Captain Salamander's rope is 3 times longer. How long is the Captain's rope? ____ ft 2) Tyger Salamander skips for 4 minutes and manages to skip 7 times every minute. How may skips does he do? ____ skips 3) Captain Salamander skips for 3 minutes and manages 9 skips a minute. How many skips does he do? ____ skips 4) In the running race, Frazer manages to run at 6 miles per hour. Flame runs three times as fast. What is her speed? ____ mph 5) In the jumping race, Captain Salamander jumps 6 inches off the ground. Sally the Shape Salamander manages to jump 4 times higher. How high does she jump? ____ inches 6) In the mud throwing competition, Tyger throws his mud 9 inches. Quadra throws her mud twice as far. How far does she throw her mud? ____ inches 7) In the running race, it takes Quadra 9 seconds to complete the race. Frazer is 3 seconds slower than her. How fast is Frazer? ____ seconds 8) At the end of the sports day, Quadra has 8 points. Captain Salamander has 5 times as many points. How many points does the Captain have? ____ points *One of these problems is a not a multiplication problem at all!* *Can you spot it?*

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		https://www.math-salamanders.com/multiplication-word-problem-worksheets.html

Additional Resources and Materials

(Additional material and resources that are not included in the Inclusive Learning and/or Inclusive Assessment Strategies that may be useful for lesson planning)

Additional Useful Content Knowledge for the Teacher: (*any additional knowledge that the writers believe would be helpful for the teacher such as reading material at a lower or higher grade level, links to curriculum documents for other grades)*

Opportunities for Subject Integration: *(Additional ideas about how the inclusive learning strategies might be adapted and/or applied to include other subjects in the curriculum)*

Strategies that Support the Curriculum and Assessment Framework

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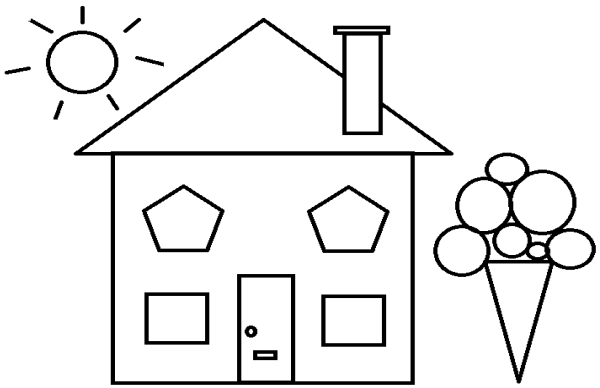
Elements that are integrated across subjects:

Elements from Local Culture, Technology, TVET, Environment that are integrated:

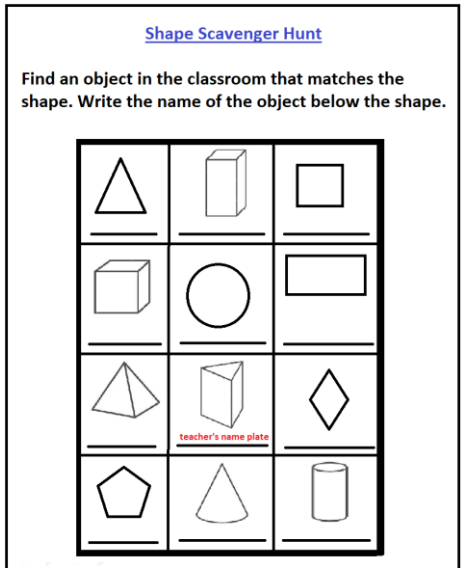
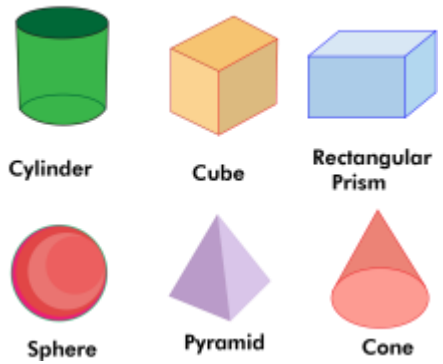
Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

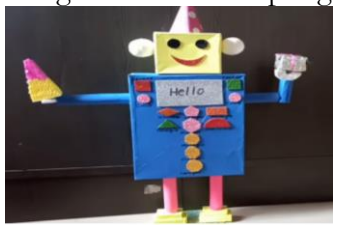
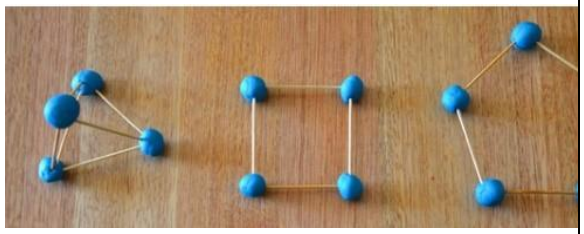
Introduction to the Subject: At this level, the experiences of pupils will be broadened to include knowledge of other geometric concepts, such as line segments, lines of symmetry, and congruent shapes whilst they continue to expand their description and sorting criteria or plane shapes (2-D shapes/ polygons). Pupils will also identify, name, classify, compare and describe basic solids (3-D) shapes in terms of their features: faces, edges and vertices. Pupils will be able to construct nets of 3-D shapes and deconstruct these nets to recognize the 2-D shape(s) within. The skills of describing, observing, extending, and creating geometric patterns using precise language to communicate knowledge about position, direction and location are fostered. *Taken From (2017 OECS PRIMARY GRADES' LEARNING STANDARDS FOR MATHEMATICS)*
Strand (Topic): Geometrical Thinking
Essential Learning Outcomes: GT: 1.1 ***Explore and Analyze Geometric shapes and Relationships-Developing a spatial sense.***
Grade Level Expectations and/or Focus Questions: ● *Explore and analyse 2D and 3D shapes in developing spatial reasoning* ● *Identify 2D shapes within 3D shapes* ● *Recognize 3D shapes within the environment and make predictions based oon3D shapes used prior to building models*

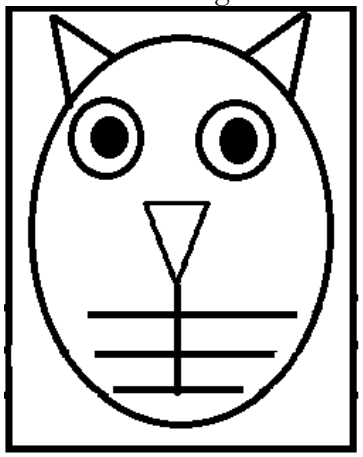
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Learners will be expected to: **<u>Knowledge</u>** 1. find 2D shapes or paths hidden in a picture or space (2D within 3D solids); 2. recognize a shape or object seen from various points of view and various distances (2D shapes in various positions in space); 3. describe a picture or object in real-world contexts using 2D shapes; 4. use positional language (prepositions) such as over, under, beside, or beneath to identify 2D shapes in a picture. **<u>Skills</u>** 5. use language and gestures that describe 2D shapes, objects, and space orally and 6. draw a picture given a description of a 2-D shape 7. Build a model from a picture or description of 3D objects in a picture of a real-world context.	**Colour Activity (Product assessment)** ***(SCO 1, 2 & 3)*** Students are given the following worksheet. **Colour in the shapes using the colours from the key.**  **There are __ circles. There are __ rectangles. There are __ triangles and there are __ pentagons.** **Key:** **Circle** **Rectangle** **Triangle** **Pentagon** Retrieved from https://www.teacherspayteachers.com/Product/Shapes-SMART-BOARD-Game-197046 **Checklist**	**Students will be guided into developing a spatial sense of the world regarding 2- 2-dimensional (2D) and 3-dimensional (3D) shapes.** ***Discovery learning (Concrete) - Use of Household items (outcomes 1 & 2)*** Students and teachers can collect household items and bring them to class. With guidance from the teacher, students will: ● observe the properties of each; ● manipulate the household items by stacking, rolling, etc. Pupils can put objects to stand and draw around the bases to identify the shapes. ● use specific geometric-related language and gestures to describe what they see (round ball, straight edges) and feel (pointy corners, etc.) and ● sort the different items according to their shape. A row of desks or containers can be labelled (with cylinder, sphere, cube, etc.) and used to place the different household items in for sorting. Different items can be - Pringles can - Tennis Ball - Soccer ball

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
<u>Knowledge</u> 8. Make predictions based on spatial reasoning about what 2D shapes can be created by the footprints of 3D solids and predict what shape is being described prior to building a model. **<u>Values:</u>** 9. appreciate the concept of 3D objects in the environment by describing objects in the environment in terms of 3-D shapes 10. relate the concept of a 2D shape within a 3D objects	Learners can identify all the 2D shapes correctly by colour-coding them. This activity allows students to complete a calm and fun activity while assessing students' knowledge of 2D shapes. It checks for some misconceptions and/or misunderstandings that may surround 2D shapes, such as size, orientation, or position, which are not defining attributes, that squares are rectangles. **'Mystery Shape' Activity (Observation Assessment) *(outcomes 5 & 6)*** Teacher prepares an opaque bag and places different mini 3D objects in it.. Students are given the name of a specific shape and are asked to close their eyes to retrieve that shape by feeling around the bag. Once they believe they have found it, they pull the shape out and say why they selected that shape. They are expected to state properties in their reasoning and identify the 2D faces within the objects. For example, I selected this shape for the cylinder because it has a curved face, 2 flat faces, and no sharp edges/vertices. The flat faces are circles.	- Marble - Mac and cheese boxes - Matchbox - Tin cans - Rubik's cube - Dice - Party hat - Cones Seeing the visuals will help students discover and understand that colour, size, and orientation are non-defining attributes.  Retrieved from: <u>http://www.thehappyteacher.co/2021/03/3-activities-for-teaching-3d-shapes.html</u> Following the previous activity (not necessarily the same day or same lesson), students complete an activity as a whole class or individually.

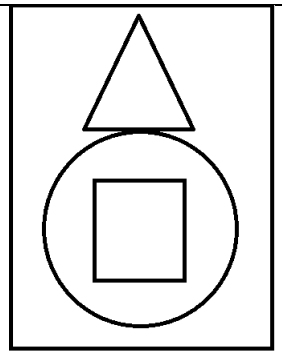
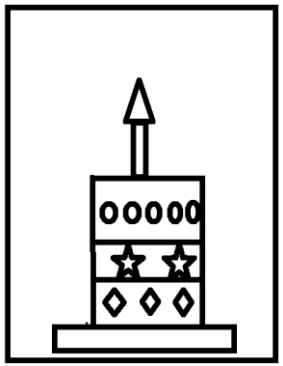
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 Retrieved from: http://www.thehappyteacher.co/2021/03/3-activities-for-teaching-3d-shapes.html This same activity can be switched where the teacher puts their hand into the mystery shape bag, and students draw the faces of the shape that h90pe/she is feeling using its attributes. **Checklist** Learner can identify at least 1 2-D shape from the faces of items selected from the bag. (yes/ no) **"Scavenger hunt" for Shapes (Product Assessment)** ***(outcomes 1, 2 & 3)***	***(SCO 2)*** Images *and* names of different 3D shapes (headings) and images of some of the same household items will be needed. The teacher places the images in 3D with their names on the board. Each student is given an image of a household item and is required to place the image under the correct category and say why.  Retrieved from https://images.google.com/ ***As individual activity*** ***(outcome 3)*** Similarly, students receive 2 sheets of paper. One with headings and blank space underneath and another with images of household items. They are required to cut and paste images under the correct category.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Each student receives a scavenger hunt sheet with different 2D and 3D shapes.  Retrieved from https://www.123homeschool4me.com/free-printable-shape-scavenger-hunt-for-kids/ Students will look at their surroundings and find items corresponding to the grid's shapes. Students should write the name of the item that matches each shape as they go. **Checklist** • Learners complete the entire sheet **(yes/ no)** • Learners complete an entire row or column (yes/ no)	This activity facilitates an essential step in transitioning from concrete to pictorial before including abstract. **Discovery through play - 'Footprints' in the playdough** ***(outcome 7)*** Make 'footprints' from 3D shapes in play dough to observe the 2D faces. Students should take turns predicting what 2D shape the different faces will make, pressing the shape onto the play dough, and observing the different faces produced. Discussions should be held after each prediction and observation pair to address misunderstandings. Use a variety of 3D shapes items: 

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	"3D Robot Model" (Product Assessment) ***(SCO 7)*** Students are asked to draw and construct a robot using 2D and 3D shapes given parameters.  Retrieved from: https://www.youtube.com/watch?app=desktop&v=qn4nDHa_ENY **Checklist** The robot must include at least 4 different 2D and 3 different 3D shapes. However, they can be used more than once. **"What am I drawing?" (Product Assessment)** *(SCO 8)* Students are each given a blank sheet of paper, a ruler and a pencil. Teacher reads out a list of directions, pausing between each to give students time to complete them. Instructions should be specific, providing direction, position, etc. Measurements are not necessary. For example, 1. First, draw a small triangle in the middle of your paper, with one point at the bottom and the base at the top.	Retrieved from: https://byjus.com/us/math/combining-and-taking-apart-3d-shapes/ **Discovery - Building 3-D models** ***(outcome 7)*** Using playdough and skewers or toothpicks, allow students to attempt to construct some 3D shapes and identify the 2D face.  Retrieved from: https://childhood101.com/hands-on-activities-for-learning-about-2d-3d-shapes/ This activity can be modified to include other round shapes with pipe cleaners.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	2. Second, draw three horizontal lines below your triangle. 3. Then, draw one short vertical line below your triangle. It must touch the bottom of your triangle and go through the middle of your three horizontal lines. 4. Next, above your triangle, draw two circles that are the same size – one on the upper left side and one on the upper right side. 5. After that, draw a smaller circle inside each of these circles. 6. Shade each of the smaller circles. 7. Draw a circle around everything. 8. Lastly, draw two triangles on the big circle - one must be on the upper right side and the other on the upper left side. The bottom of the triangles must touch the big circle.  *Retrieved from https://images.google.com/* What does your drawing look like?	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Checklist ● Learner produced image with all shapes shown (yes/ no) ● Learner is able to describe the image as a cat face **(yes/ no)** ● Leaner produced an image with at least four shapes **(yes/ no)** **Think, Pair, Share *(SCO 8)*** Allow students to exchange their drawings with a neighbour and compare their drawings. They are expected to observe both drawings and look for similarities as well as differences. After they have compared, allow some pairs to share the differences and similarities with the rest of the class. The remainder of the class is responsible for comparing both drawings to the directions given by the teacher. This is done with guidance from the teacher. Now it's the students' turn to give the directions. They can work in small groups or individually. Teacher gives each group or each student one image. Students are expected to construct a set of directions that could be used to draw that image successfully. The level of complexity comes with the image given. i.e. a lower achieving group gets a less complex image, such as:	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 Retrieved from https://images.google.com/ **Checklist** Learners are able to identify at least 2 similarities and 1 difference between the drawings. (yes/ no) **For higher achievers**:  *Retrieved from https://images.google.com/*	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Each group receives a different image. One group of a similar ability has to attempt drawing the image of another group using only their instructions. This will help each group refine their instructions and adjust them as needed. This activity can be enhanced for older students by including measurements (2 cm line), phrases like parallel and perpendicular lines, 3D shapes, types of triangles, angles, etc. This activity forces students to engage in reflective thinking as well as metacognition. Students reflect not only on their work but also on the instructions given. It provides the opportunity for them to identify and correct their errors as well as errors made by other students. This activity also aids with comprehension, ordinal adverbs (first, second, etc.)_ and transitional words (then, next, finally, etc.)	

Additional Resources and Materials

cereal boxes, matchboxes, plain and coloured paper

(teachers will use discretion in viewing part or full-length videos based on need)

Additional Useful Content Knowledge for the Teacher:

2- D shapes/ 2 dimensional shapes:
https://byjus.com

For teacher:

In Mathematics, 2D shapes can be defined as plane figures that can be drawn on a flat (or plane) surface or a piece of paper. All the 2d shapes have various parameters such as area and perimeter. Some 2d shapes contain sides and corners, whereas some have curved boundaries.

The basic types of 2d shapes are a circle, triangle, square, rectangle, pentagon, quadrilateral, hexagon, octagon, etc. Apart from the circle, all the shapes are considered polygons with sides. A polygon with all sides and angles equal is called a regular polygon. Including the circle, an ellipse is also a non-polygon shape. Both circles and ellipses are curved, whereas polygons have a closed structure with sides.

Polygons:

A polygon is a two-dimensional geometric figure with a finite number of sides. The sides of a polygon are made of straight line segments connected to each other end to end. Thus, the line segments of a polygon are called sides or edges. The point where two line segments meet is called a vertex or corner, and an angle is formed. An example of a polygon is a triangle with three sides. A circle is also a plane figure, but it is not considered a polygon because it is a curved shape and does not have sides or angles. Therefore, we can say that all the polygons are 2d shapes, but not all the two-dimensional figures are polygons.

A Polygon is a closed figure comprising line segments (not curves) in a two-dimensional plane. A polygon is the combination of two words, i.e. poly (means many) and gon (means sides).

3-D shapes:

In geometry, 3D shapes are solid shapes or figures that have three dimensions. Generally, length, width, and height are the dimensions of 3D (three-dimensional) shapes. The common names of these shapes are cube, cuboid, cone, cylinder and sphere. 3D shapes are defined by their respective properties, such as edges, faces, vertices, curved surfaces, lateral surfaces and volume.

Positional language:

Positional language words refer to where things are positioned or where they appear about other things.

Understanding position in space and how things are relative to each other is part of a child's visual perception and cognitive development.

For students

2D Shapes Names

1. Circle - a closed-dimensional (2D) shape with a curved line with no corners or edges.
2. Triangle - a 2-dimensional shape with three sides and three vertices (corners).
3. Square- a 2-dimensional shape with four equal sides, and each angle is equal to 90°

4. Rectangle- a 2D shape with four sides in which the opposite sides are equal and parallel, and all four angles measure 90°
5. Pentagon- a 2D shape with five sides
6. Octagon - a 2D shape with eight sides

Retrieved from https://www.cuemath.com/geometry/2d-shapes/

Opportunities for Subject Integration:

-measuring 2D and 3D shapes
-finding missing shapes in sequences
- geometric construction
-sketching for problem-solving
-drawing the next term in a sequence or pattern
-tessellations
-attributes of shapes
-building, stacking and organizing of objects
-comparing and describing objects as well as developing their understanding of tessellations.

Strategies that Support the Curriculum and Assessment Framework

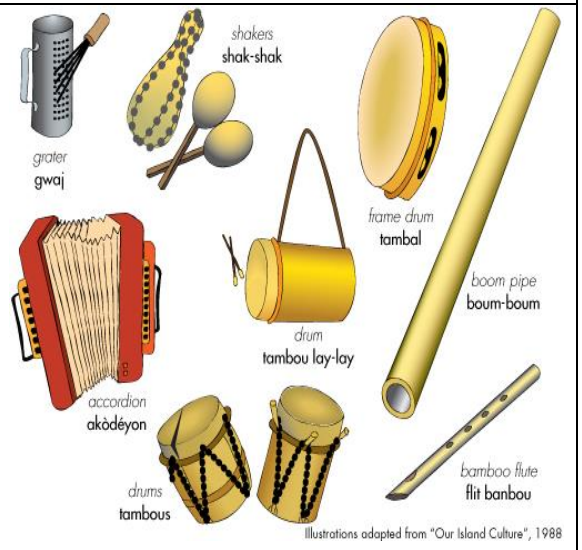
Elements that are integrated across subjects:

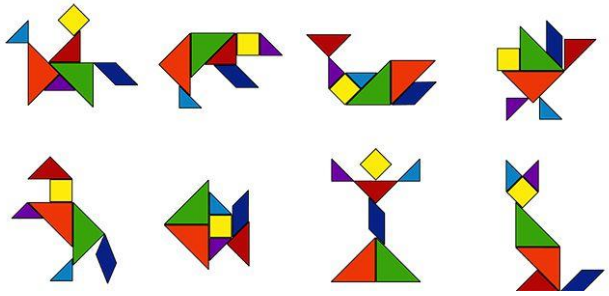
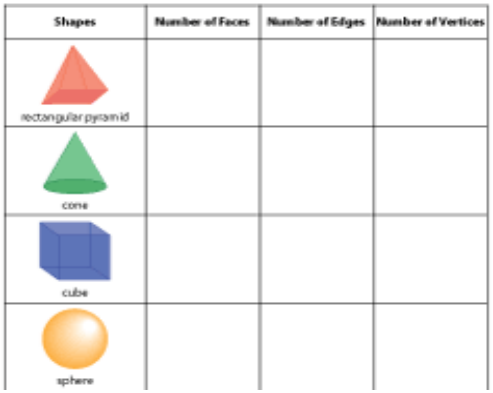
Elements from Local Culture, Technology, TVET, and Environment that are integrated:

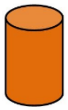
Items of Inspiration (teaching tips, inspirational passages, connections to educational research)

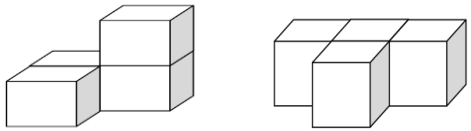
Introduction to the Subject:
Strand (Topic): Geometric Thinking
Essential Learning Outcomes: GT 1.2: *Explore and analyze Geometric Shapes and Relationships: Sorting, patterning and building 2D and 3D Shapes*
Grade Level Expectations and/or Focus Questions: *Recognize, name and construct 2D and 3D objects, as well as compare and sort them based on their characteristics or attributes. They are to build models from pictures or descriptions of shapes and create patterns using them.*

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Learners will be expected to: **2-D shapes** **<u>Knowledge</u>** 1. Identify given shapes as 2-D or 3-D 2. Compare the characteristics of 2-D shapes (number of sides, congruent sides, number of corners, reflective symmetry, rotational symmetry) 3. List shapes that are representative of 2-D shapes 4. Identify 2D shapes in patterns **3-D Shapes** 5. compare the characteristics of 3-D shapes (number of edges, number of vertices, shape and number of faces, congruent faces) 6. list objects that are representative of either 3-D shapes 7. identify 3-D shapes in patterns	**Observation *(SCO 1)*** *Identification of objects that look like shapes* Have students go around the school and make a list of objects that may look like shapes (2-D on diagrams or the faces of 3-D objects). (3-D, e.g. clock (cylindrical), chalkboard (cuboid), globe (spherical), juice bottle(cylindrical). Have students present their list to the class **Checklist** Students can identify at least three 2-D shapes and three 3-D shapes (**yes /no)** ***Naming and sorting of shapes*** (**Product Activity)** ***(outcomes 3, 6,10)*** Students are to name the shapes and place them where they belong.	**Guides students into comparing the attributes of 2-D and 3-D shapes** ***Conceptual Understanding - Pictorial (SCO 1)*** Provide students with pictures of musical instruments(they will recognize them as being instruments from jing ping bands that normally accompany the folk dancers ***(Teacher will use instruments relevant to culture)*** Have them identify the shapes each instrument best looks like (2-D faces and 3-D shapes) Have them say if any instruments do not look like any of the shapes discussed in the lesson.

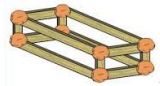
Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Skills 8. construct models of shapes based on given descriptions or from a picture 9. Construct patterns using shapes 10. Sort 2D or 3D shapes based on attributes and characteristics **Values** 11. acknowledge shapes by differentiating between 2D and 3D shapes (objects) in their environment. 12. value the part shapes play in infrastructure by building models using varied shapes.	 Retrieved from https://www.mathworksheets4kids.com/solid-shapes/compare-2d-3d-shapes/color/basic-shapes-preview.png **Checklist** Learners are able to complete the worksheet **(yes/ no)** Learners are able to identify correctly at least two 2-D shapes and two 3-D shapes **(yes/ no)** **Discovery Learning** *(SCO 4 and 9)* Students will use tangram puzzles to arrange the shapes to make a pattern. Students will share their creations with peers.	 Retrieved from https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.domnitjen.com%2Farticles%2Fleisure%2Flison-kweyol%2Fjingping.html&psig=AOvVaw1JNNJVRYgAjAjMqvMrlZwJ&ust=1698011949557000&source=images&cd=vfe&opi=89978449&ved=0CBEQjhxqFwoTCLDJh6uQiIIDFQAAAAAdAAAAABAD ***Meaningful learning - Drawing (SCO 5)***

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 Retrieved from https://www.pinterest.com/pin/752453050228208105/ **Checklist** Learners can create puzzles with at least three 2-D shapes. **Game Activity *(SCO)*** Mysterious Musical Shape Box *2-D and 3D Shapes* and their attributes Students will pass a wrapped box around while music plays. When the music stops, the pupil who is holding the box will unwrap the paper, and a tag will be there with the name of a 3D shape written on it. The student is to give an example of the shape and list the attributes. This continues until the last paper is unwrapped, and the student discovers the mystery	Students will be asked to draw their favourite 3D shape and discuss its attributes (edges, faces and vertices) A worksheet will be filled with the information.  Retrieved from https://images.google.com/ ***Discovery Creating Models (SCO 8)***

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	object inside the box and says what shape it most looks like. **Checklist** ● Learners can given an example of one 2-D shape and one 3-D shape from the environment **(yes/ no)** ● Learners can list at least one attribute of a specific 2-D shape and one attribute of a specific 3-D shape **(yes/ no)** **Talking Circles** *(SCO 5)* While sitting in a circle and taking turns, have students discuss the information from previous lessons related to the following terms: faces, vertices, vertex, and edges. **Checklist** Learners can define, using examples, each of the attributes listed. For example, learners can pick a shape of their choice within the classroom or one brought from home. Using the object, learners will identify the edges or faces, etc. Each learner must outline at least 2 attributes. **Think, Pair Share** ***(SCO 5)***	Students will be given sticks and play dough and be asked to create a model of a given shape using them.  cone   cylinder  Retrieved from https://images.google.com/ ***Meaningful learning - Discussion (SCO 5&6)*** Students will be asked to pick one shape from a bag and discuss whether it can be stacked, rolled, etc. **Sample Questions**: What shape does this object have? Can it roll or stack? Are there similar shapes in the classroom? Does it look like any other shape, you know?

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Groups will be asked to select six shapes from a set and fill in a table to answer questions based on them. Each group will share the information from their worksheet, |	Shape 1	hape 2	Shape 3	Shape 4	Shape 5	Shape 6 | | --- | --- | --- | --- | --- | --- | --- | | At least one circular face | | | | | | | | No circular face | | | | | | | | At least one triangular face | | | | | | | | No triangular faces | | | | | | | | At least one square or rectangular face | | | | | | | | No square or rectangular faces | | | | | | | Retrieved from https://images.google.com/ **Checklist** • Learners can accurately complete worksheets **(yes/ no)** • Learners can accurately complete at least one column **(yes/ no)** • Learners can accurately complete one row **(yes/ no)** **Exit Ticket *(SCO 11 & 12)*** *Helps with understanding the uses of shapes based on their characteristics*	***Discovery - Building Models (SCO)*** Students will be given 4 cubes and asked to use them to make the given models.  Retrieved from https://images.google.com/ Students will then be given four other shapes, such as a cone or sphere, and asked to attempt to create a model as with the cubes. Have students discuss. **Sample questions**: How would you describe the new shape? Is it still a cube? How many edges does the new shape have?

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Use this……, not that. Students will be asked to think about a given problem and select the best shape that would solve it. e.g. Johnny wants to use an object for the wheel of the toy car he is making. Which object should his tyres most look like?  Retrieved from https://images.google.com/ **Checklist** Learner identifies a suitable shape **(yes/ no)** **Exit Ticket (alternative)** ***(SCO 8 & 11)*** The odd one out Distribute cards with a set of shapes and have students identify the odd one.  Retrieved from https://images.google.com/ Students will be given sticks and clay dots and be asked to use the materials to create a shape based on a	

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	given description. (Students can be given paper and asked to draw). E.g. A shoebox looks like me. I am a solid shape with two long sides and two short sides. (cuboid)  Retrieved from https://images.google.com/ There are lots of me in Egypt. I have a point at the top. My base is never round. (pyramid)  Retrieved from https://images.google.com/ Students will go around watching the construction or drawing of their peers and discuss their shapes. **Checklist** Learner creates shape accurately based on description **(yes/ no)**	

Additional Resources and Materials

Videos

Riddles on 2D Shapes
https://www.youtube.com/watch?v=6i7_MRDwURg

3D Shapes Song
https://www.youtube.com/watch?v=ZnZYK83utu0

2D vs 3D Shape - How to differentiate between the two
https://www.youtube.com/watch?v=gk_u1xr7jQg

Faces, Vertices and Edges
https://www.youtube.com/watch?v=JYtZK0ruxJQ

Interactive Games

2D Shapes

https://www.education.com/games/2d-shapes/

Matching 3D Shapes

https://www.abcya.com/games/shape_matchhttps://www.abcya.com/games/shape_match

Interactive Worksheets

https://www.liveworksheets.com/worksheets?keys=2d+and+3d+shapes+&age=

(teachers will use discretion in viewing part or full-length videos based on need)

Additional Useful Content Knowledge for the Teacher:

Sorting and patterning are two skills typically taught very early. From sorting toys as children clean up from centers to practicing patterns during calendar time, children are exposed to sorting and patterning in many natural ways. However, some kids do not pick up on those skills as easily as others.

Retrieved from *https://thekindergartenconnection.com/secrets-developing-sorting-patterning-skills/*

Opportunities for Subject Integration:

-identifying patterns using shapes
-building, stacking and organizing of objects
-finding the perimeter of shapes
-analyzing statistical data involving 2D and 3d shapes

Strategies that Support the Curriculum and Assessment Framework

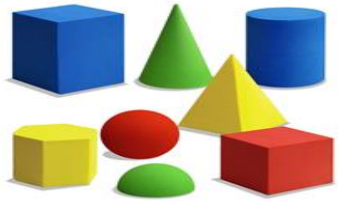
Elements that are integrated across subjects:

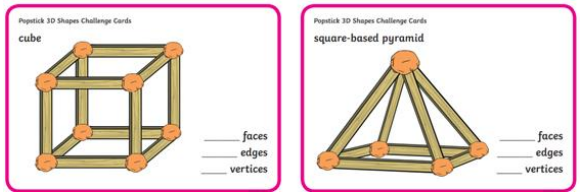
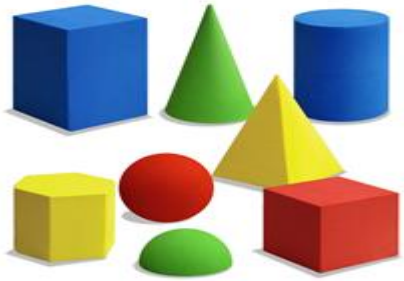
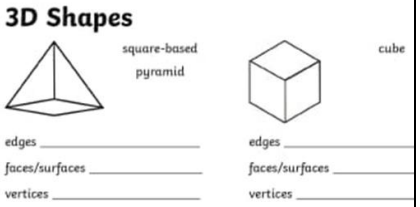
Elements from Local Culture, Technology, TVET, and Environment that are integrated:

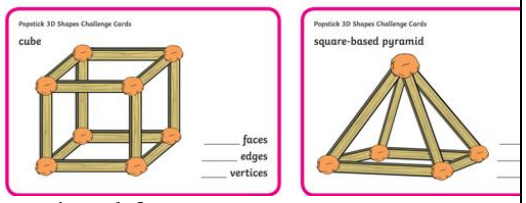
Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

Geometric Thinking ELO G 2.1

Introduction to the Subject:
Strand (Topic): Geometric Thinking
Essential Learning Outcomes GT: 2.1: *Recognizing, naming and Describing Shapes- Analysing and Describing Shapes*
Grade Level Expectations and/or Focus Questions: • *recognize, describe and justify attributes and characteristics of prisms and pyramids according to their bases, faces, edges and vertices or combining to a point;* • *to recognize, sort and describe regular and irregular polygons according to the number of vertices and sides* • *describe and identify congruent sides of polygons* • *to identify lines of symmetry in 2-D shapes by folding*

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Students will be expected to: **<u>Knowledge</u>** 1. describe attributes and characteristics of 3-D shapes (prisms and pyramids) according to their bases, faces, edges and vertices 2. classify polygons that are regular and irregular 3. identifying and describing polygons according to the number of sides and vertices	**<u>Entrance Product Slip</u> *(outcome 1)*** Students are given a variety of shapes, as seen below, to manipulate and have random discussions.  Retrieved from <u>https://images.google.com/</u> **Checklist** Learners can state at least two similarities and at least two differences among them.	**Guide students into describing attributes and characteristics of 2-D and 3-D shapes.** **The learners will:** ***Conceptual Understanding - Sorting (outcome 1)*** Sort the shapes in these three categories a. has a pointy tip b. can roll c. has a flat base

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
4. differentiate between similar and congruent objects **Skills** 5. create lines of symmetry in 2-D shapes by folding 6. match congruent 3-D shapes **Values** 7. Students will develop a greater awareness of prisms and pyramids in the environment by describing their attributes.	**Think and Share *(SCO 1 & 7)***  Retrieved from https://images.google.com/ Shapes, as shown above, will be given to students. Students will think of two differences and share them with the class. The teacher records it. **Checklist** Learners shared at least 2 differences (**yes/ no)** **Group Work/ Observation *(SCO 1 & 7)*** Students are given a set of pop sticks and playdough. The students will use the resources provided to create the shapes seen in the diagram.  Retrieved from: https://upperglanmirens.ie/wp-content/uploads/2021/02/Making-3D-shapes.pdf Students will 1. Count the amount of playdough pieces needed to join the pop sticks and record it.	 **Retrieved from https://images.google.com/** ***Conceptual learning - Describing Attributes (outcome 1)*** Copy and complete the table below.  Retrieved from https://images.google.com/

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	2. Count and record the number of pop sticks required to create the above diagram 3. Discuss with the teacher the number of cut-outs it would require to cover the shape **Checklist** ● Learner successfully counted the number of vertices (play dough pieces for at least 1 shape) **(yes/ no)** ● Learner stated the correct number of cutouts required to cover the shape **(yes/ no)** **<u>Discovery Learning</u>** ***(SCO 1 & 7)*** Using a variety of resources such as pipe cleaners, straws, pop sticks and glue, students will create a variety of shapes and write a sentence or two about the shapes they created. Checklist Learner writes at least one sentence describing the shape created **(yes/ no)**	**Conceptual Understanding -** ***<u>Concrete (outcome 1)</u>*** Use the diagram created as shown below, to define, in their own words, the terms face, edge and vertices/corner of a 3-D shape.  Retrieved from: <u>https://upperglanmirens.ie/wp-content/uploads/2021/02/Making-3D-shapes.pdf</u>

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
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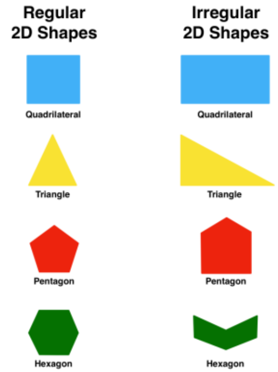
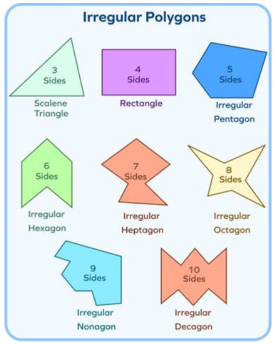
<u>**Discussion (*SCO 2)***</u>





The shapes on the left are considered to be regular, and those on the right are said to be irregular. Students will spend two minutes looking at the shapes and then discuss their thoughts on why some are considered irregular and others regular with the teacher.

Checklist

Learners can state at least one difference between the regular and irregular polygons **(yes/ no)**

<u>**Game/Role play**</u> **(outcome 3)**
Students will be engaged in a game called "Check my sides."

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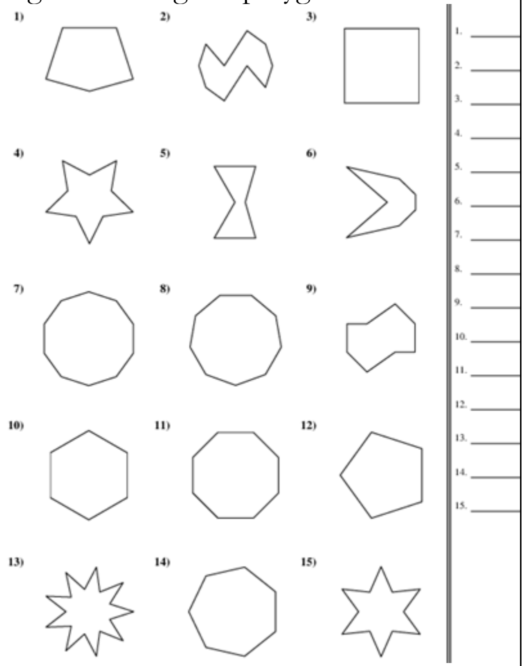
Conceptual Understanding - Classifying shapes (SCO 2)

Determine whether the shape is a regular or irregular polygon.



Retrieved from <u>https://images.google.com/</u>

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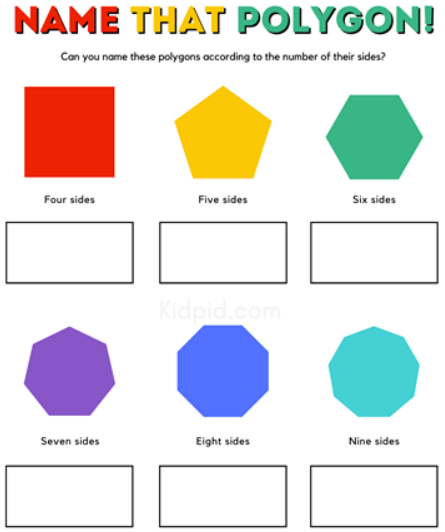
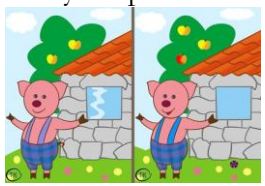
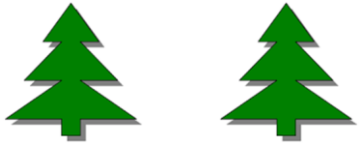
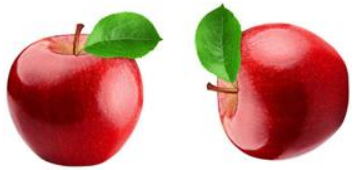
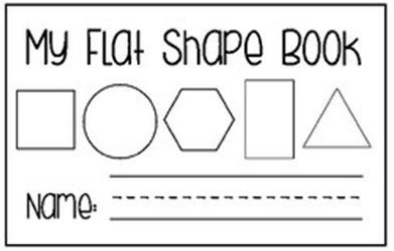
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Teacher presents a polygon to the students, and they will check the number sides. Students' response will be "You have _____sides." The teacher then says, "I bet you don't know my name. Students have the opportunity to respond. The teacher will highlight those who are right by saying: "you are right; my name is _____. The teacher continues and awaits students' responses: "Can you see and count my corners?" "Is there another name for my corners?" As a culminating lesson, students will lead the game rather than the teacher. **Checklist** Learner can accurately determine the number of sides **(yes/ no)** Leaner can accurately name the corresponding shape **(yes/ no)** **<u>Think, Pair and Share</u> (SCO 5)** 	***Conceptual Understanding - Identifying polygons (SCO 3)*** Copy and complete the worksheet.  *Retrieved from https://images.google.com/* ***Meaningful learning - Describing polygons (outcome 3)*** Create a booklet. On each page, a different shape should be drawn, stating its name and number of sides. They can also create various booklets; each one in the actual shape. On each page, they put a different attribute. So, instead of one booklet, they actually have booklets with the actual shape.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	In groups of twos, each student is given a shape to fold in half so that both sides look the same. Students will look at their partner folding and share with the teacher. *One shape will have lines of symmetry, and the other will not. **Checklist** Learner successfully folds the heart shape to show lines of symmetry **(yes/ no)** **<u>Observation/Discussion</u>** ***(SCO 4 & 6)*** Students will be involved in probing discussions that will lead to understanding congruence. Can you spot the differences?  Can you spot any differences?  Are these the same?  Are these the same? State why?	 *Retrieved from https://images.google.com/* ***Conceptual Understanding Listen and sing along (SCO 5)*** listen to the video on lines of symmetry, then state two things you learnt from the video <u>Symmetry for Kids | Lines of Symmetry | Symmetry in Real-life Objects</u> <u>Symmetry Song for Kids | A Day at Symmetry Land | Lines of Symmetry</u> ***Conceptual Understanding - Drawing (outcome 5)***

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<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr><td></td><td>


Checklist

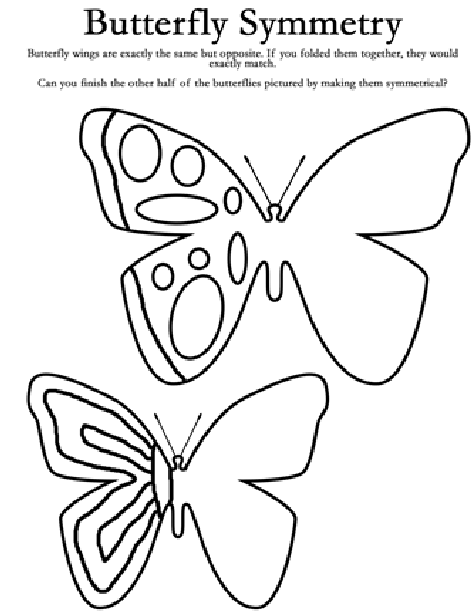
- Learner can post at least one similarity and one difference **(yes/ no)**

<u>**Exit Product**</u>
Students will observe the art placed on the chalkboard or through a projector. In the artwork, students will seek to identify 2-D shapes, prisms, pyramids, and congruent shapes through constructive and well-organized discussion.

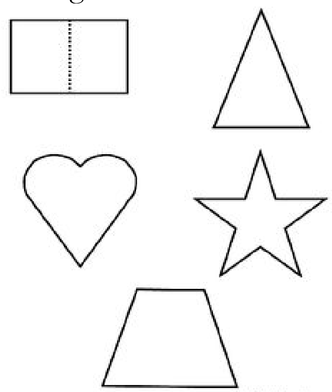
Retrieved from <u>https://images.google.com/</u>

Checklist

Learner can identify at least one example of each type of shape listed **(yes/ no)**
</td><td>
Complete the drawing



Draw the lines of symmetry for each of the diagrams on the sheet.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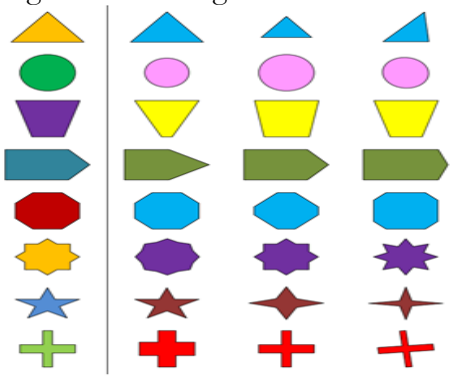
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		Retrieved from https://images.google.com/ Identify the shape on the right that is congruent to the figure on the left.  Retrieved from https://images.google.com/ ***Discovery - Using Tangram Puzzles*** ***(SCO 6)*** Students can be asked to create a set and make different objects with the pieces shown below, then answer the following questions.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		 Retrieved from https://images.google.com/ 1. How many triangles can you identify? 2. Using the colours, which two triangles are congruent 3. How many squares can you identify? 4. What animal does the shape resemble? 5. Can you draw another animal using shapes?

Additional Resources and Materials

- pipe cleaners
- construction paper
- 3-D shapes
- worksheets
- glue

(teachers will use discretion in viewing part or full-length videos based on need)

Additional Useful Content Knowledge for the Teacher:

Congruent- Shapes that are exactly the same shape and size
Polygons- 2-Dimensional shapes

Opportunities for Subject Integration:
-identifying patterns using shapes
-finding the area and perimeter of regular and irregular shapes
-analyzing statistical data involving 2D and 3d shapes

Strategies that Support the Curriculum and Assessment Framework

Elements that are integrated across subjects:

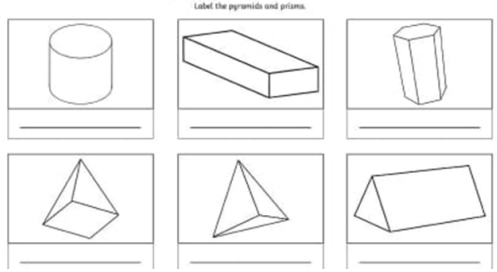
Elements from Local Culture, Technology, TVET, and Environment that are integrated:

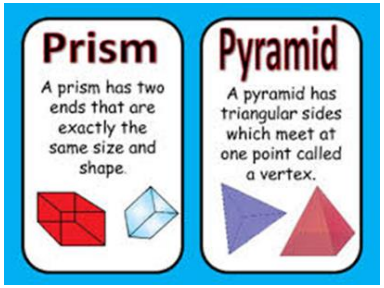
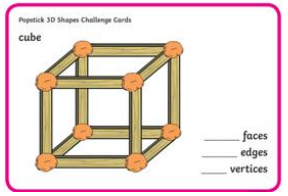
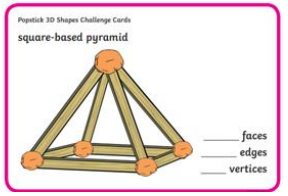
Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

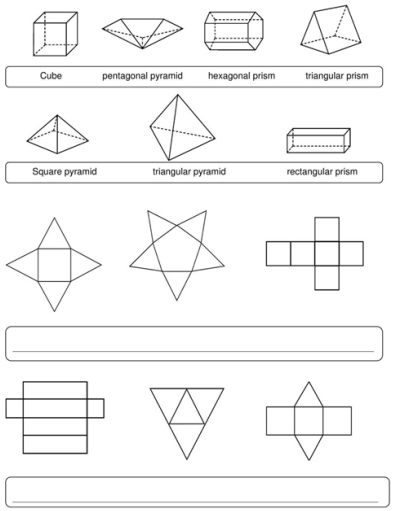
Geometric Thinking ELO G2.2

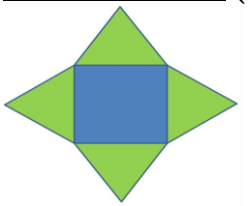
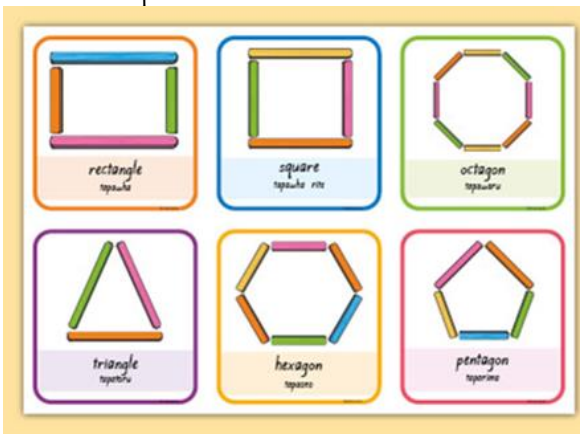
Introduction to the Subject:
Strand (Topic): Geometric thinking
Essential Learning Outcomes: GT: 2.2 ***Recognizing, Naming and Describing Shapes - Naming 2-D and 3-D Shapes***
Grade Level Expectations and/or Focus Questions: Recognize, Describe, and compare attributes and characteristics of prisms and pyramids, namely triangular, rectangular, square, pentagonal and hexagonal. To build specific prisms and pyramids from nets and to construct 2-D shapes.

Specific Curriculum Outcomes	**Inclusive Assessment Strategies:**	**Inclusive Learning Strategies**
Students will be expected to: **<u>Knowledge</u>** 1. identify prisms and pyramids (namely triangular, rectangular, square, pentagonal, and hexagonal) 2. identify different structures with the shape of prisms and pyramids. 3. describe and compare the attributes of prisms and pyramids (namely triangular,	**<u>Entrance Slip</u>** ***(outcome 1)*** Students will spend a minute looking at the activity pyramid and discuss the activities they are involved in with the teacher.  Retrieved from https://images.google.com/	**:** **Guide students into comparing attributes of varied prisms and pyramids.** ***Working with Pyramids (outcome 1)*** **The learners will:** Construct a pyramid activity chart that depicts their daily activities as shown below

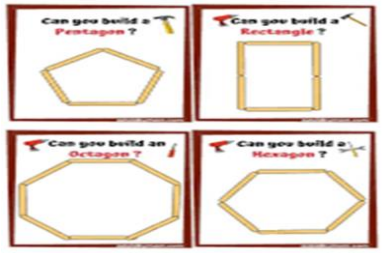
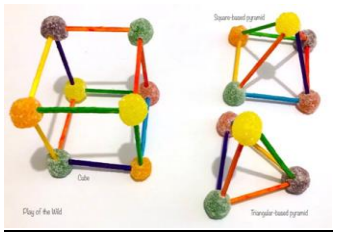
Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies
rectangular, square, pentagonal, and hexagonal) **Skills** 4. create prisms and pyramids using simple resources 5. build specific prism and pyramids from nets (namely triangular, rectangular, square, pentagonal, and hexagonal) 6. construct pyramids and prisms using 2-D shapes (nets) 7. construct polygons using 3 to ten lines to build nets. 8. Name 2-D shapes (faces used in the nets of prisms and pyramids 9. construct patterns using 2-D shapes 10. build and create diagrams with different 3-D shapes **Values**	**Checklist** ● Learner can describe at least one activity. **(yes/ no)** ● Learner can include at least one 3-D shape in describing an activity **(yes/ no)** **Movie Time** ***(outcomes 1 & 3)*** Students will look at the video presented and discuss with the teacher the difference between prisms and pyramids, as highlighted in the video. Prisms and Pyramids | Grade 3 & 4 Math | TutWay **Checklist** ● Learner is able to state at least one difference between prisms and pyramids **Discussion** ***(outcomes 1, 2 & 3)*** Students will look at the shape below and discuss with the teacher what are the similarities and differences.	 Retrieved from https://images.google.com/ ***Conceptual understanding - Identifying prisms and pyramids (Outcomes 1&2)*** 1. State whether the shape is a prism or a pyramid  Retrieved from https://images.google.com/ 2. Complete the assigned quiz https://quizizz.com/admin/quiz/5b2c25a4f0c91c00198b98b0/identifying-prisms-and-pyramids ***Describing prisms and pyramids (outcome 3)***

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies
11. accept the existence of prisms and pyramids by identifying and building models	  Retrieved from https://images.google.com/ **Checklist** Learner can state at least 1 similarity and one difference **(yes/ no)** **Observation** ***(SCO 1, 2 & 11)*** Items are placed in a box, and each student is asked to dip one. Students will name their object, use it, and discuss with teachers if the object they possess is a pyramid or a prism. 	Use the diagram created as shown below, to count the number of faces, edges and vertices/corners of the prism and the pyramid.   Retrieved from: https://upperglanmirens.ie/wp-content/uploads/2021/02/Making-3D-shapes.pdf ***Discovery - Identifying prisms and pyramids in the environment (SCO 3 & 11)*** Observe the diagram and identify what type of shape it is and justify their answer  Retrieved from https://images.google.com/ ***Discovery - Identifying prisms and pyramids in the environment (outcome 11)***

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies
	 Retrieved from https://images.google.com/ **Checklist** Learner can identify at least one example of a prism and one example of a pyramid **(yes/ no)** **Field trip** (***SCO 11)*** Students are taken to the playground where they will identify different prism and pyramids used to construct the playground  Retrieved from https://images.google.com/ **Checklist** Learner can identify at least one example of a prism and one example of a pyramid	Circle all the pyramids in the diagram and draw a square around the prism.  Retrieved from https://images.google.com/ **Matching nets to 3D shapes (outcome 8)** Write the name of the shape under their nets. There is one extra shape without a net.  Retrieved from https://images.google.com/

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies
	<u>Think and share</u> (*SCO 1, 5, 6, 7 & 8)*  *Retrieved from <u>https://images.google.com/</u>* Students will name the 2-D shapes in the diagram. Students will then think of the shape that this diagram can make and then share it with the class. **Checklist** Learner can state the total number of edges and vertices Learner can name the shape that can be made from a diagram **<u>Group work</u> - Product *(SCO 5, 6 & 8)*** Teacher will pair students. Each pair will be given nets of either a pyramid or a prism in which they will build the shape. At the end of the lesson, students will present their shape by name and state whether it is a prism or pyramid.	***Discovery learning (SCO 10)*** 1. Use the materials provided, such as popsticks, to create a prism or a pyramid using any of the following 2-D shapes below.  Retrieved from <u>https://images.google.com/</u> 2. Using the video as a guide <u>3D shapes with clay I clay modelling for kids.</u> Construct a cardboard house with either a pyramid roof or a prism roof

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies
	Checklist Learners successfully produce either a prism or pyramid. **<u>Group work - Product</u>** **(SCO 4,5,6,10)** In groups of four, the teacher will assign students the task of building a pyramid or a prism. Students will first sketch 2-D shapes (nets) needed to build a prism or pyramid. Using popsticks or other similar materials, students will then use the nets to create an actual pyramid or a prism.	 Retrieved from <u>https://images.google.com/</u> <u>How To Make Beautiful House With Cardboard And Cement | How to make Cardboard House | Cardboard House</u>

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies
	  Retrieved from https://images.google.com/ **Checklist** Learners successfully sketched nets or constructed **Exit Slip *(SCO 1, 2, 3 & 11)*** Students will look at homes from different Caribbean descendants and discuss whether the roofs have a pyramid shape, a prism shape, or both.	

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies
	 Amerindians  Slave Quarters  Plantation Masters Retrieved from https://images.google.com/ **Checklist** Learners can identify the shape of at least ⅔ of the roofs above **(yes/ no)**	

Additional Resources and Materials

- glue
- clay
- pipe cleaners
- cardboard
- colours

(teachers will use discretion in viewing part or full-length videos based on need)

Additional Useful Content Knowledge for the Teacher:

Pyramids have a polygonal base and flat triangular faces, which join at a common point called the apex. A pyramid is formed by connecting the bases to an apex.
A prism is a solid shape that is bound on all its sides by plane faces. There are two types of faces in a prism. The top and bottom faces are identical and are called bases. A prism is named after the shape of these bases. For example, if a prism has a triangular base it is called a triangular prism.

Opportunities for Subject Integration:

-completing patterns involving prisms and pyramids
-identifying 2D shapes
-analysing statistical data involving prisms and pyramids

Strategies that Support the Curriculum and Assessment Framework

Elements that are integrated across subjects:

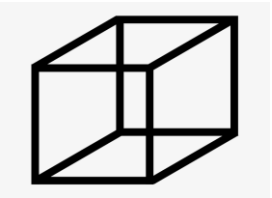
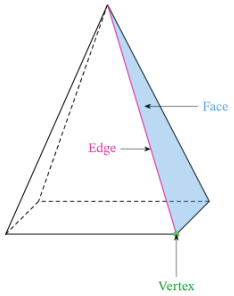
Elements from Local Culture, Technology, TVET, Environment that are integrated:

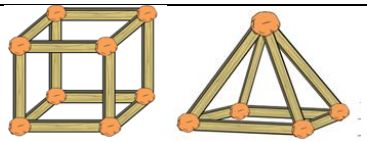
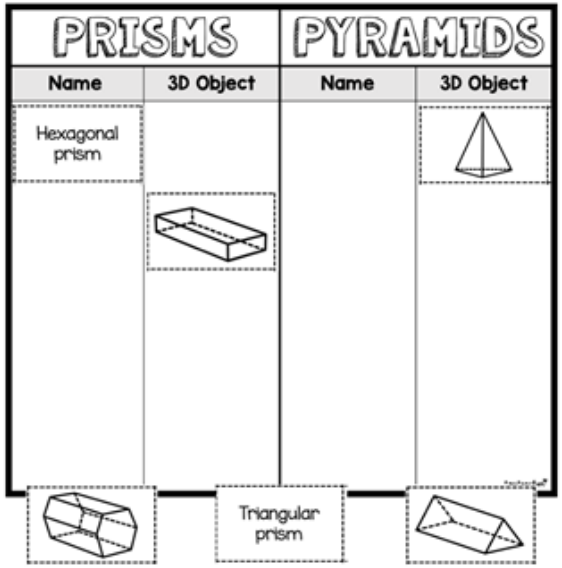
Items of Inspiration (teaching tips, inspirational passages, connections to educational research)

Geometric Thinking ELO G2.3

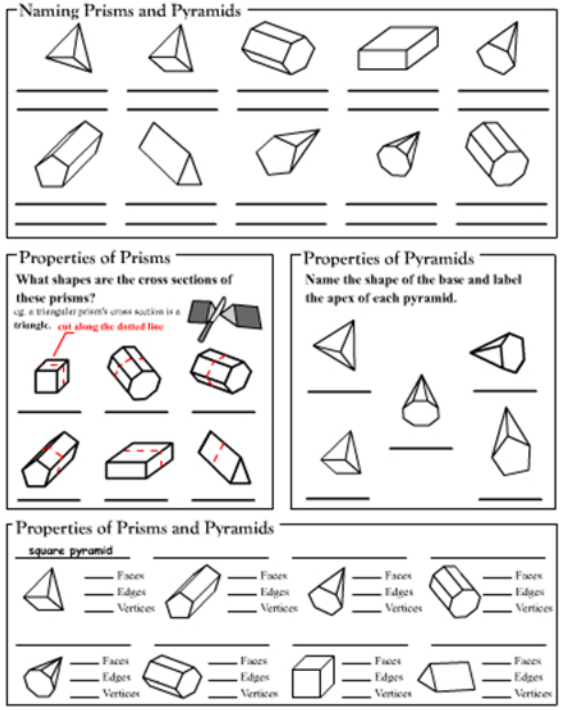
Introduction to the Subject:
Strand (Topic): Geometric Thinking
Essential Learning Outcomes GT: 2.3: ***Recognizing, naming and Describing Shapes- describing relationships between and among shapes***
Grade Level Expectations and/or Focus Questions: Recognize, describe, and compare attributes and characteristics of prisms and pyramids (faces, edges, vertices, or coming to a point)

Specific Curriculum Outcomes	**Inclusive Assessment Strategies:**	**Inclusive Learning Strategies:**
Students will be expected to: **<u>Knowledge</u>** 1. identify the face, edges, vertices of prisms and pyramids 2. recognize patterns involving the attributes and characteristics of prism and pyramids	**Entrance Slip** Students will look at the shape below and discuss with teacher the following: 1. What is it? 2. What can it be used for? 3. Do you use it at home? Other general questions pertaining to just the object and not its attributes  Retrieved from https://images.google.com/ **Checklist** ● Learner can name objects and shape	**Guide students into describing relationships between prisms and pyramids** **The learners will:** ***Conceptual Understanding (outcome 1)*** 1. Use math boxes from home, students will look at the box and observe the different dimensions. Sample questions: Does it have faces? How many faces can you see? 

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Skills 3. use cut-outs to create faces of shapes 4. construct objects around them and count the number faces, edges and vertices they possess **Values** 5. Students will have a greater awareness of the intricacies in prisms and pyramids by comparing their attributes in object and architectural designs	• Learner can outline at least 1 way it is used **(yes/ no)** **Observation** ***(outcomes 1& 2)*** Students will count the number lines on the diagram below and the number of areas each line meets.   **Checklist** • Learner can accurately count all lines (edges) **(yes/ no)** • Leaner can accurately count all vertices (points) **(yes/ no)** **Group Work - product** ***(outcomes 3 & 4)*** Using construction paper, scissors and glue students will cover pre-made frames and state the amount of cut-outs was required to cover each side of the shape in a presentation at the end of the class.	Retrieved from https://images.google.com/ 2. Look at the picture. Circle the vertices and trace over the edges with a red crayon.  Retrieved from https://images.google.com/ ***Meaningful learning (outcomes 2 & 5)*** Analyse the diagram and discuss with the teacher the quantity of tarpaulins that is required to cover the entire tent if one tarpaulin is allocated for each side

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 **Checklist** Learners can accurately count the number of cut-outs (faces) required to cover each side **(yes/ no)** **<u>Games</u>** ***(outcomes 1, 2 & 5)*** **<u>Explore & Play with Prisms</u>** Students will explore the properties of four prisms (triangular, rectangular, pentagonal, hexagonal). In a box students will choose two items and discuss with each other the items they have chosen as well as what they are used for. Additionally, students will highlight the numbers of faces (F), vertices (V), and edges (E) for each prism. This activity will encourage students to speak freely whilst learning the characteristics.	 Retrieved from https://images.google.com/ Stick the cut-outs in the correct area. ***Conceptual Understanding (outcomes 1&2)***  *Retrieved from*

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	  Retrieved from https://images.google.com/ **Checklist** Learners can identity accurately the number of faces, vertices and edges for at least one object **(yes/ no)**	https://cdn.topteacher.com.au/wp-content/uploads/2023/07/Prisms-and-pyramids-sort-top-teacher.png 1. Complete the worksheet below

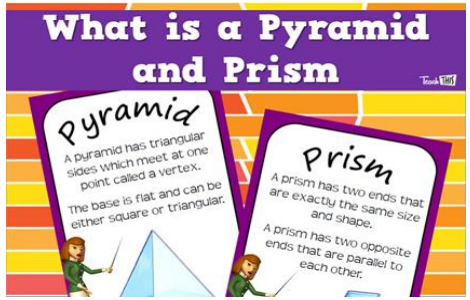
Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	<u>Think and Share</u> *(SCO 2)* Students will look at the information below Think of a pattern and share with the class 	Name	Picture	Base	Vertices	Edges	Fac
---	---	---	---	---	---
Triangular Pyramid		3	4	6	4
Square Pyramid		4	5	8	5
Pentagonal Pyramid		5	6	10	6
Hexagonal Pyramid		6	7	12	7 | | Name	Picture	Base	Vertices	Edges	Fac
---	---	---	---	---	---
Triangular Prism		3	6	9	5
Rectangular Prism		4	8	12	6
Pentagonal Prism		5	10	15	7
Hexagonal Prism		6	12	18	8	 Retrieved from <u>https://images.google.com/</u> **Checklist** Learner can identify at least one pattern in the from each table	 Retrieved from <u>https://images.app.goo.gl/svgm3apgij3EhMpD7</u> **2. <u>Listening Activity/ Video</u>** <u>Maths | 3D shapes | What are Pyramids? | Let's count the faces, edges and vertices together~</u>

Additional Resources and Materials

Gift box, dice, other items that can be found around the students home

(teachers will use discretion in viewing part or full-length videos based on need)

Additional Useful Content Knowledge for the Teacher:



Retrieved from: https://images.app.goo.gl/7Q2RhTqFmsLmcrHr7

Opportunities for Subject Integration:

-completing patterns involving prisms and pyramids
-differentiating between prisms and pyramids
-analysing statistical data involving prisms and pyramids

Strategies that Support the Curriculum and Assessment Framework

Elements that are integrated across subjects:

Elements from Local Culture, Technology, TVET, Environment that are integrated:

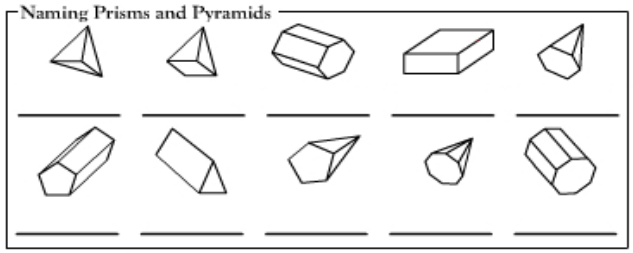
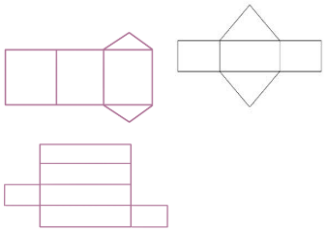
Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

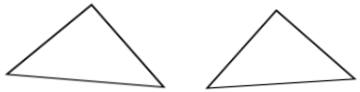
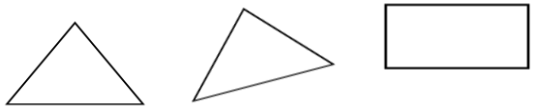
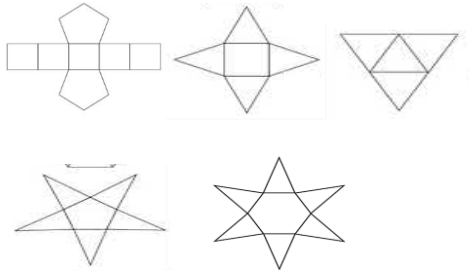
Geometric Thinking ELO G3.1

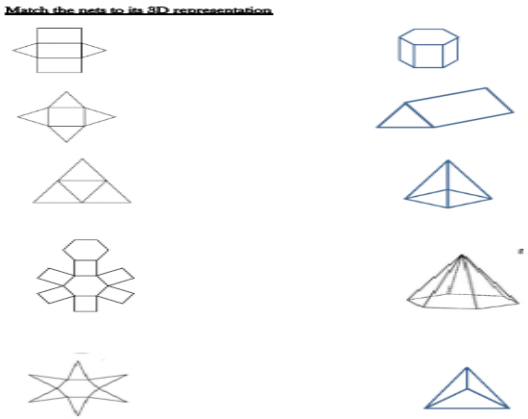
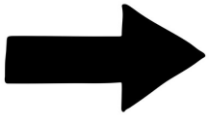
Introduction to the Subject:
Strand (Topic): ***Geometric Thinking***
Essential Learning Outcomes: GT:3.1: ***Composing , Decomposing and Transforming Shapes- Combining Shapes***
Grade Level Expectations and/or Focus Questions: *Students should be able to construct objects by building skeletons of specific prisms and pyramids (triangular, rectangular, square, pentagonal. hexagonal)as well create these from nets. Students will be able to explain what composite shapes and construct composite 3D shapes.*

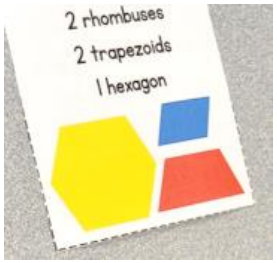
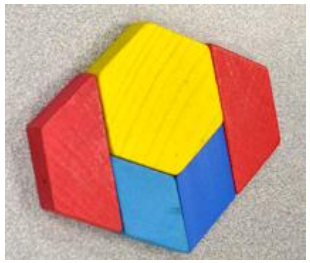
Specific Curriculum Outcomes	**Inclusive Assessment Strategies:**	**Inclusive Learning Strategies:**
<u>Knowledge</u> 1. recognize shapes as being either pyramids or prisms 2. identify different types of pyramids and prisms **<u>Skills</u>** 3. utilize building skeletons of specific prisms and pyramids to create objects 4. use nets to construct different types of pyramids and prisms	**Entrance Slip *(SCO 1)*** Students will be shown a pyramid and prism and given two descriptions . They will be asked to match the shape to the description **Checklist** Learner can match at least one shape to its description **(yes/ no)**	**Guide students into identify parts of prisms and pyramids, and use them to combine shapes** ***Conceptual Understanding - Concrete (SCO 1 & 2)*** Students will be given manipulatives of pyramids and prisms and asked to identify those with rectangular bases, squared bases, triangular, pentagonal, hexagonal

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Values 5. place a greater value on pyramids and prisms by using nets. 6. appreciate the complexities of prisms and pyramids by creating composite shapes.	**Talking Circles *(SCO 2)*** Listen to students as they discuss what they learnt in the previous lessons about the triangle, square, hexagon, pentagon and rectangle (these shapes form the bases of pyramids and prisms) **Checklist** Learner can accurately describe at least one prism or pyramid (objects can be used as examples in description) **(yes/ no)** **Product Assessment *(SCO 2)*** Students will be given a worksheet and asked to name the pyramids and prisms	 Retrieved from https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.amazon.com%2FLearning-Advantage-Folding-GeoFigures-Geometric%2Fdp%2FB001UG0BRA&psig=AOvVaw2MjqT2nVcIf1IfxF0DQvD5&ust=1698067614128000&source=images&cd=vfe&opi=89978449&ved=0CBEQjhxqFwoTCOCCyNffiYIDFQAAAAAdAAAAABAD ***Conceptual Understanding - Concrete (SCO 1 & 2)*** Students will select a type of pyramid or prism) and discuss its attributes (base, vertices, edges face) ***Discovery (outcome 3)*** Students will then use straws/ match sticks and clay dots to create the skeleton of the object.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 Retrieved from *https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.studyladder.com%2Fgames%2Factivity%2Fnaming-prisms-and-pyramids-4302&psig=AOvVaw2g1KvRDm1fXoRBORtsuf2B&ust=1698006183372000&source=images&cd=vfe&opi=89978449&ved=0CBEQjhxqFwoTCPC9-ev6b4IDFQAAAAAdAAAAABAD* **Checklist** Learner can correctly identify at least 6/10 shapes as either a prism or a pyramid **(yes/ no)** **Product Assessment *(SCO 3, 4 & 5)*** Have students watch the following video which explains the nets of prisms and pyramids Retrieved from https://youtu.be/2MwB0XzhqRQ Students will then be presented with cut outs of either one type of pyramid detached. Have students identify the shapes.	  Retrieved from https://images.google.com/ ***Conceptual Understanding (SCO 3 & 4))*** Students will be presented with the nets of different types of prisms and pyramids.They will be asked to use different crayons to trace the 2 D shapes they see. 

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Explain to students that these shapes can be attached together to build the net of a type of prism or pyramid. E.g.   Retrieved from https://images.google.com/ Student volunteers will be given the opportunity to attempt to put the shape together using clay dots/ double sided dots and determine the shape (rectangular based pyramid) Students will then be given the following worksheet and asked to match the nets to their 3 D representation. Students can fold the nets they have created to assist them.	 Retrieved from https://www.kristakingmath.com/blog/nets-volumes-surface-area-of-prisms http://msroymaths7.weebly.com/surface-area--nets.html ***Meaningful learning (SCO 4 & 5)*** 1. Students will be given card paper and cut outs of nets . They will be asked to trace the nets on the paper using a ruler to assist. They will then be given safety scissors to cut out the nets they have drawn in order to fold them ensuring they are bent properly. 2. Have students look at the following shape and identify it

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 Retrieved from https://images.google.com/ **Checklist** ● Learner can build prism using cut-outs ● Learner can match each net to its respective 3-D presentation **Think and Share - Product** ***(SCO 4, 5 & 6)*** *Constructing Composite shapes* Students will be given a die roll three times. They will then collect the number of cutouts / manipulatives of different shapes based on the number the die rolled on. They will then use these to construct a composite shape in their groups. Allow students to view the shapes created by their peers.	 Ask the following question "What if I wanted to create this shape using two shapes, what shapes could I use ?" Have students draw the two shapes that could be used to create the arrow. Have students share their answers. ***Conceptual Understanding (outcome 6)*** Have students watch the video Retrieved https://youtu.be/98DNidWqI6c It demonstrates how some composite shapes may be formed using different combinations of other shapes. Allow students to draw a shape that can be created by putting two or more other shapes together.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	E.g.  =  Retrieved from https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.pinterest.com%2Fpin%2F454511787365841226%2F&psig=AOvVaw2EW0LDG6m4BR8IsiTonZqP&ust=1698006506945000&source=images&cd=vfe&opi=89978449&ved=0CBEQjhxqFwoTCNjmgoz8h4IDFQAAAAAdAAAAABAJ **Checklist** Learner constructed shape based on the results from the die roll **(yes/ no)** **Exit Ticket - Product** Distribute cards to students and observe students as they identify the composite shape formed by joining the two shapes on them. **Checklist** Learner successfully joined the shapes to form a composite shape **(yes/ no)**	

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:

Additional Resources and Material

Video

More on the Prisms and Pyramids (includes practice questions)
https://www.youtube.com/watch?v=uRduESW9lk8

Interactive Games

Playing with pyramids
https://www.learner.org/wp-content/interactive/geometry/pyramids/

Playing with Prisms
https://www.learner.org/wp-content/interactive/geometry/prisms/

Composing Objects
https://www.turtlediary.com/game/compose-shapes-using-one-square-three-triangles.html

Working with Pattern Blocks
https://www.coolmath4kids.com/manipulatives/pattern-blocks

(teachers will use discretion in viewing part or full length videos based on need)

Additional Useful Content Knowledge for the Teacher:

To decompose a shape means to break it apart into other smaller (and sometimes different) shapes.
To compose a figure means to put together shapes to form the new figure.

Understanding how to compose and decompose shapes is especially important because these understandings provide the foundation for understanding other areas of mathematics.

For students

A net is what a 3D (three-dimensional) shape would look like if it were unfolded or opened out flat.

A composite shape is a shape created from the combination of two or more 2 D basic shapes and polygons . These shapes can be referred to as compound and complex shapes as well.

Opportunities for Subject Integration:
-completing patterns involving composite shapes
-differentiating between prisms and pyramids
-analysing statistical data involving prisms, pyramids, and composite shapes

Strategies that Support the Curriculum and Assessment Framework

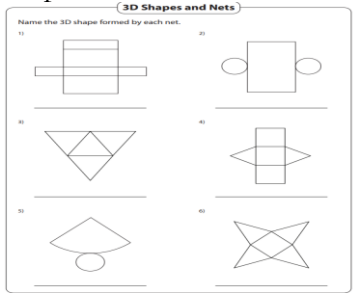
Elements that are integrated across subjects:

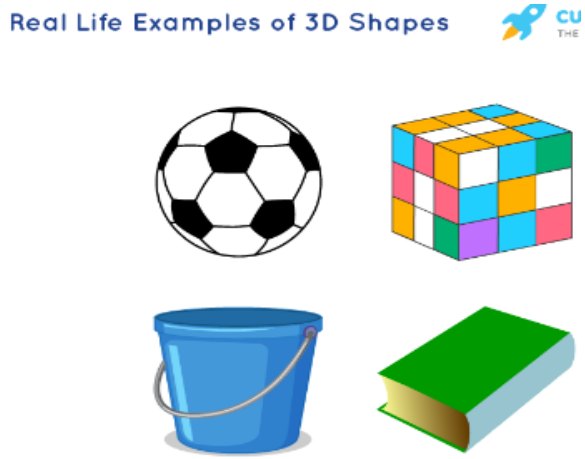
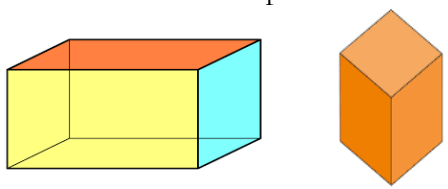
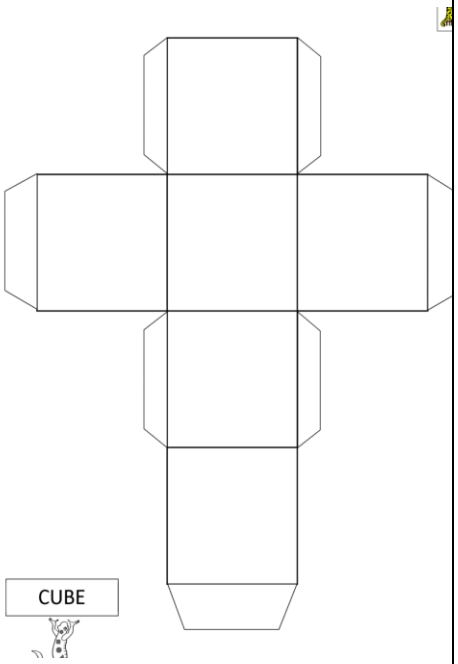
Elements from Local Culture, Technology, TVET, Environment that are integrated:

Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

Geometric Thinking ELO G3.2

Introduction to the Subject:
Strand (Topic): Geometrical Thinking
Essential Learning Outcomes: GT3.2 ***Learners will be able to compose, decompose and transform shapes - deconstructing shapes***
Grade Level Expectations and/or Focus Questions: By the end of the grade level students will be able to: • deconstruct shapes into nets of specific prism and pyramids • deconstruct nets into 2D shapes found in 3-D objects • deconstruct objects identifying 2-D shapes that can be found in cubes, cones, cylinders, spheres , prism and pyramids through making, footprints, shadows or slicing.

Specific Curriculum Outcomes	**Inclusive Assessment Strategies**	**Inclusive Learning Strategies:**
<u>Knowledge</u> 1. .identify the 2-D shapes (faces) of prisms and pyramids 2. name 2-D shapes on 3-D nets of prisms and pyramids	**Entrance Slip** ***(SCO 1,2,4)*** Name the 2-D shapes on the nets of these 3-D shapes.  Retrieved from <u>https://images.google.com/</u> Learner can name all the 2-D shapes on 4/6 nets	**Guide students into decompose prisms and pyramids using 2-D shape and nets** ***Conceptual Understanding (SCO 1 & 2)*** Students identify, unfold, and explore nets of cubes, rectangular prisms and pyramids. ***Meaningful learning (SCO 1 & 2)*** Students in groups or pairs, draw the faces when seen when the nets of a 3-D shape are opened.

Skills 3. deconstruct shapes into nets of specific prisms and pyramids. 4. deconstruct nets into 2D shapes found in 3-D objects 5. deconstruct objects identifying 2-D shapes that can be found in cubes, cones, cylinders, spheres , prism and pyramids through making, footprints, shadows or slicing.	**Product Assessment *(outcome 2, 3, 5)*** 1. What 2-D shape(s) faces are found on each 3D shape? Draw it.  2. Which 2-D shapes can be seen on the faces of each of these 3-D shapes ?  3. Look at this (desk/tin), name at least two 2-D shapes that can be found on it.	Students will name the shape of faces seen. e.g. squared faces, rectangular faces  . ***Cooperative learning*** ***Whole Class activity (outcomes 1&2)*** Students identify by numbering and name the 2d shape(s) that are found/seen in a given 3d shape drawn or solid.

	 **Checklist** Learner can successfully respond to at least ⅔ questions above	***Cooperative learning*** ***Whole Class activity (outcomes 1&2)*** Given real life solids/3d shapes such as matchboxes, erasers, books, things around the classroom etc. students will point out and describe the 2d shape face(s) they see. ***Cooperative learning*** ***Whole Class activity (SCO 3 & 5)*** Have students deconstruct the objects that they are able to and identify the 2d shapes seen.

Additional Resources and Materials

https://nzmaths.co.nz/resource/2D-3D-shapes-representations
https://handsonmath.blogspot.com/2012/11/deconstructing-3d-shapes-to-2d-shapes.html

(teachers will use discretion in viewing part or full length videos based on need)

Additional Useful Content Knowledge for the Teacher:

For students

Decomposing (or decomposition) is the process of dividing a geometric figure into smaller (non-overlapping) recognizable shapes.

Composing shapes means combining two or more simple shapes to create a larger shape.

A transformation is a way of changing the size or position of a shape.

Retrieved from https://www.bbc.co.uk/bitesize/topics/z2dqrwx/articles/zcjs97h

Opportunities for Subject Integration:
-completing patterns involving 2D shapes
-differentiating between prisms and pyramids of varied sizes
-analysing statistical data involving 2d shapes, prisms, and pyramids

Strategies that Support the Curriculum and Assessment Framework

Elements that are integrated across subjects:

Elements from Local Culture, Technology, TVET, Environment that are integrated:

Allow students to use material in their surroundings

Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

Geometric Thinking ELO G3.3

Introduction to the Subject:
Strand (Topic): Geometrical Thinking
Essential Learning Outcomes: GT: 3.3 ***Composing, Decomposing and Transforming Shapes-Transforming Shapes***
Grade Level Expectations and/or Focus Questions: *Transform 3D objects using concrete materials(straws, pipe cleaners, toothpicks, marshmallows, etc.) to represent prisms and pyramids*

Specific Curriculum Outcome	**Inclusive Assessment Strategies**	**Inclusive Learning Strategies**
<u>Knowledge</u> 1. recall and describe the characteristics of 2D and 3d shapes (prisms or pyramids). 2. identify faces which make(s) a specific 3-D shape (prisms or pyramids) **<u>Skills</u>** 3. decompose/ Dissect prism and pyramids to reveal the component parts.	**Entry activity: Matching *(outcome 1)*** ● given shape cards/worksheet or on the board.(2-D and 3-D shapes) Students match descriptions to shapes **Checklist** Leaner can match at least one description to its shape **Individual work/Observation/Product Assessment**	**Guide students into transforming prisms and pyramids using 2-D shape and nets** ***Conceptual Understanding (outcomes 1, 2 & 3)*** ● Students cut along dotted lines of the nets of 3-D shapes to get the 2-D shapes. Students identify which 2-D shapes it is. ● students glue on matchsticks, card paper or toothpicks to cover the cut outs.

<table>
<tr><th>Specific Curriculum Outcome</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr>
<td>4. manipulate 2-D shapes and transform into prisms and pyramids

<u>Values</u>

5. appreciate the value of 2-D shapes (faces) in transforming them into prisms and pyramids.</td>
<td>(outcomes 3,4 & 5)

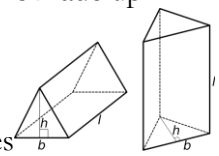
● Each student identifies the 2-D shapes seen in given 3-D shapes (pictures and manipulative/solids). Students may also draw what they see.

Checklist

Learner produces a sketch or actual prism or pyramid using toothpicks and marshmallows

Product Assessment (SCO 2 & 3)

● Students complete a worksheet.

1. Four triangu;ar faces make up a _____
2. Six squared faces make up a _____
3. The shape below is made up of_____ faces 
4. What 2-Dshape (faces) make up a rectangular prism?_____

5. What shape will I get if I replace the triangul;ar face in question 4, with a square?_____</td>
<td>● Students are given pictures of 3-D shapes and using the solidified net cut outs attempt to construct the 3d shapes.

Meaningful learning (outcomes 5)

Students complete the table below

<table>
<tr><th>Name of 3-D shape</th><th>Made up of</th><th>My sketch</th></tr>
<tr><td>1)eg: Square Base Pyramid</td><td>1 square face and 4 triangular faces</td><td></td></tr>
<tr><td>2)</td><td></td><td></td></tr>
<tr><td>3)</td><td></td><td></td></tr>
</table>

Meaningful learning (SCO 3 & 4)

Students are directed to
a) construct a 3-D shape using cut outs
(b) to break it up into its parts
(c) to change/ transform it into another 3d shape by adding or removing parts.</td>
</tr>
</table>

Specific Curriculum Outcome	Inclusive Assessment Strategies	Inclusive Learning Strategies

Additional Resources and Materials:

sites/internet:
https://splashlearn.com

https://mathmonks.com

https://liveworksheet.com

youtube videos:

Prisms and Pyramids | Grade 3 & 4 Math | TutWay - YouTube

Identifying Prisms and Pyramids | Grade 2 & 3 | Math | 3d Shapes

At home items;(small boxes, paper cylinder(container)

Human resource
Construction specialist/engineer/carpenter

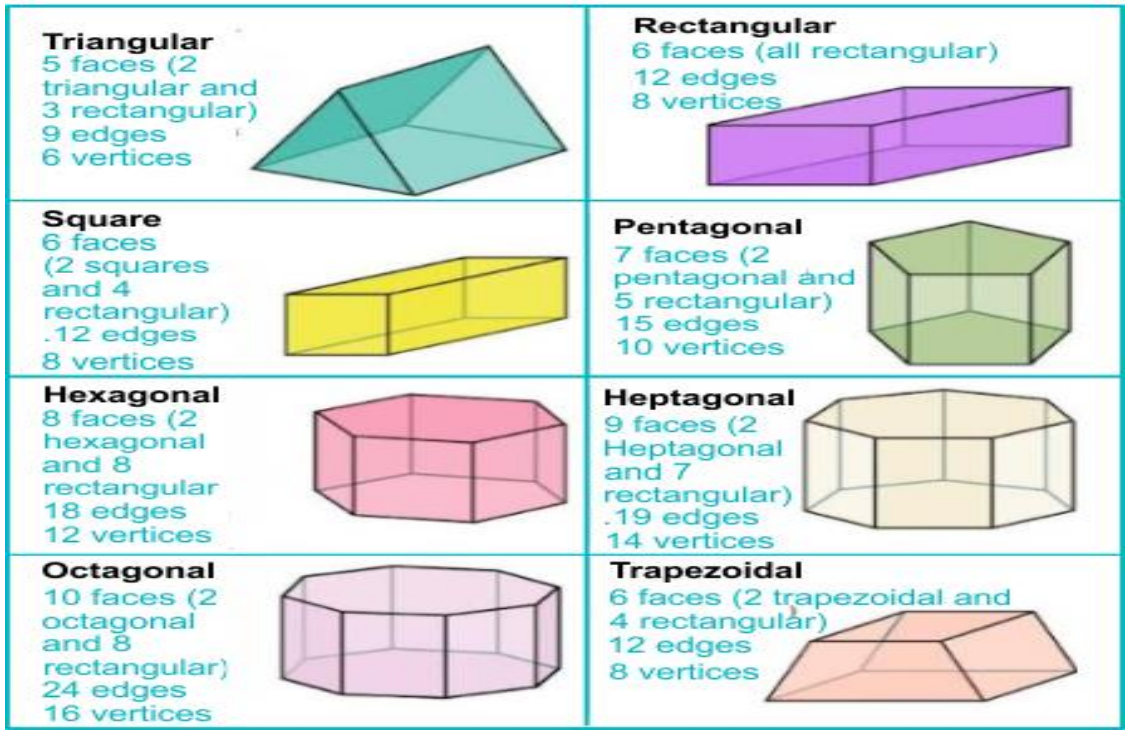
(teachers will use discretion in viewing part or full length videos based on need)

Additional Useful Content Knowledge for the Teacher:
Prism:
https://www.spalshlearn.com

A prism is a solid shape/3-Dimensional that is bound on all its sides by plane faces. They are identified as prisms because the top face is flat.There are two types of faces in a prism. The top and bottom faces are identical and are called bases. A prism is named after the shape of these bases.
For example, if a prism has a triangular base it is called a triangular prism.

testbook

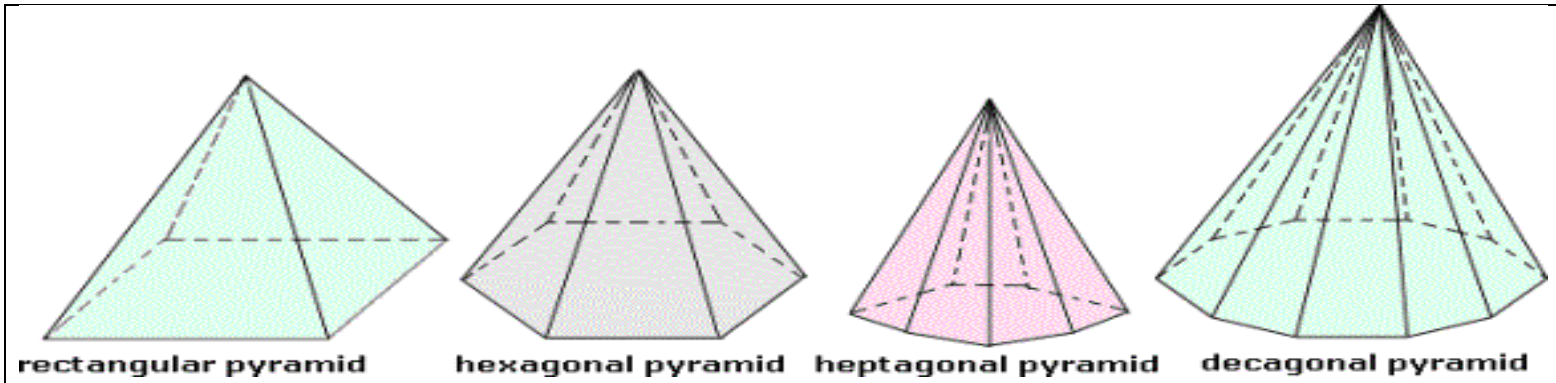
Prism Shapes



Pyramid:

A pyramid is a 3-dimensional shape. It has a flat polygon base. all the other faces are triangles and are called lateral faces. the number of lateral faces equals the number of sides of its base. The vertex is the common point where three or more of the edges meet. except for the base, all the faces connect at the vertex at the top called the Apex.

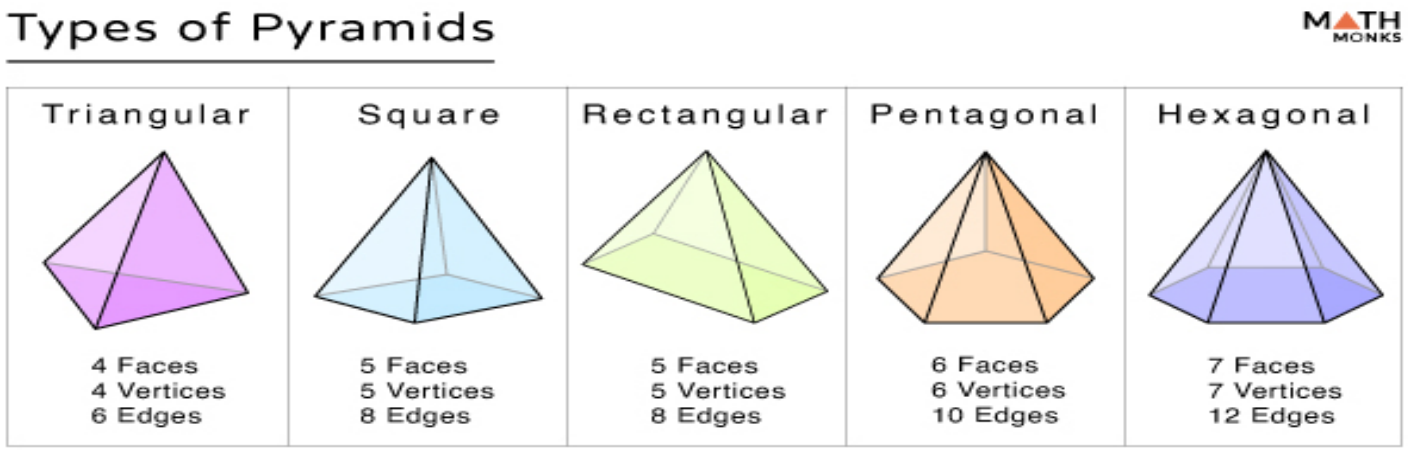
https://iCoachMath.com



Composing shapes Composing shapes means combining two or more simple shapes to create a larger shape. Simple shapes in geometry include triangles, circles, squares, rectangles, etc. While composing shapes, you can combine any of these shapes. You can use the same or different shapes to construct a new shape.

To decompose is to separate into two or more parts. To decompose figures can mean the separation of a shape into two or more non overlapping shapes.

https://mathmonks.com



Edge: *A straight line that connects any two adjacent vertices of a prism is called its edge.*

Vertex: *The corners of a prism where any two edges meet are called vertices.*

Face: *It is a closed, flat surface surrounded by vertices and edges.*

Opportunities for Subject Integration:

Mathematics:
-measuring 2D and 3D shapes,
-finding missing shapes in sequences
-geometric construction
-Sketching for problem solving
-drawing the next term in a sequence or pattern
–tessellating
Learning about shapes and their attributes help with mathematical reasoning and assists students to help predict the building, stacking and organizing of objects.. It will help students to be able to compare and describe objects as well to develop their understanding of tessellations.

A knowledge of shapes is the basis for understanding and developing an appreciation of architecture and engineering.
The concepts of composing and decomposing shapes can help students better understand the part-whole relationships and the concept of equivalent fractions.

The concepts of composing and decomposing shapes can help students better understand the part-whole relationships and the concept of equivalent fractions.

By learning how to compose and decompose, students will be better able to take a step-by-step approach to solve questions related to area, perimeter, and volume .

Construction of 3-d shapes from 2-d shapes, colouring. **Draw, colour, and cut out 2d shapes that make special size 3d shapes.**

Strategies that Support the Curriculum and Assessment Framework

1. Discussions
2. Observations
3. Checklist
4. Worksheets
5. Portfolio

Elements that are integrated across subjects:
Language

- *Creative Writing: Students can write a shape poem . Where students write a poem inside a shape about that shape or students write the lines of the poem at certain lengths to form the shape they are writing about*
- *Writing/write a paragraph describing: How to make a 3d shape(Prism or Pyramid shape) from 2d shapes…… (material)*
- *Free/Oral Expression..speak about your shape*
- *Vocabulary: words and meanings/synonyms. (corner = vertex)*
- *Story telling involving shapes*
- *Comprehension- understanding and following directions;*
- *Ordinal adverbs – first, second, third, … ;*
- *Transitional words –next, then, after, finally, etc.*
- *composition : writing descriptive sentences/paragraph*
- *vocabulary/ sight word expansion*

Art and craft: *drawing, building , creating shapes with useful resources around them, observing architectural structures using 3-D shapes*

Social Studies *: The flags of many Caribbean Countries feature various shapes. Various types of houses feature different shapes, discussion on pyramids and their origins, homes used by our ancestors, observing the environment around us*

Science*: Instruments used for various experiments and measurements have different shapes eg. barometer , wind sock, test tubes,beaker, funnel*

VPA*: Musical Instruments can be made using various 3D Shapes*
Items of different shapes can be used to create craft (toilet paper tube unicorn, a snail made from a CD), the creation of composite shapes using

basic shapes in drawing as well as constructing models using papier mache, clay, etc

e.g. 

https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.yourdictionary.com%2Farticles%2Fshape-poems-kids-examples&psig=AOvVaw0YBIkgAHEulVH1F4ky1U3m&ust=1698018453768000&source=images&cd=vfe&opi=89978449&ved=0CBEQjhxqFwoTCIDL5d6oiIIDFQAAAAAdAAAAABAD

https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.brookside.leics.sch.uk%2Fattachments%2Fdownload.asp%3Ffile%3D1046%26type%3Dpdf&psig=AOvVaw0YBIkgAHEulVH1F4ky1U3m&ust=1698018453768000&source=images&cd=vfe&opi=89978449&ved=0CBEQjhxqFwoTCIDL5d6oiIIDFQAAAAAdAAAAABA

Elements from Local Culture, Technology, TVET, Environment that are integrated:

- B*uilding and construction*
- *Manufacturing of packaging boxes, barrels etc.*
- *Carpentry*

- *Creation of local craft items using shapes*

Items of Inspiration

You see, it's never the environment; it's never the events of our lives, but the meaning we attach to the events - how we interpret them - that shapes who we are today and who we'll become tomorrow.
Tony Robbins

Love comes in all different shapes, sizes, and shades.

Tayshia Adams

Teaching is a very noble profession that shapes the character , calibre and future of an individual.-A.P.J Abdul Kalam

I have found that I could say things with colour and shapes that I couldn't say in any other way- Things I had no words for -Georgia O' Keefe

Measurement Grade 3 ELO MI.1

Introduction to the Subject:

Learning is centered on the development of skills that allow students to perform tasks of estimating,comparing,measuring and recording different attributes of measurement. Pupils first learn to measure attributes using non-standard units; then through focused discussion of differences in results obtained, pupils explain reasons for standard units of measurement. Pupils choose appropriate instruments and units relative to the measurement of length, area, perimeter, and time. These are fundamental concepts in mathematics.

Length, area, and perimeter are used to measure characteristics of geometric shapes. These measurements/concepts play a crucial role in everyday life and having an understanding of these concepts are essential for problem solving involving shapes and their properties.

Time is a fundamental concept in education and involves reading and interpreting clocks, having an understanding of the measurement of a period and developing skills in managing their time effectively. Having an understanding of time helps children make sense of their world.

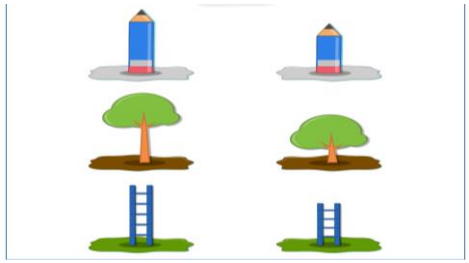
Strand (Topic): Measurement

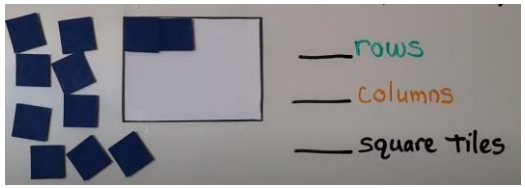
Essential Learning Outcomes:

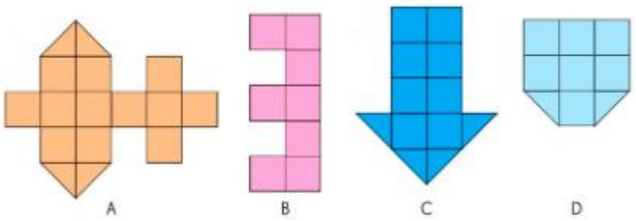
M1.1 Understanding what and how we are measure-Developing an understanding of measurable attributes.

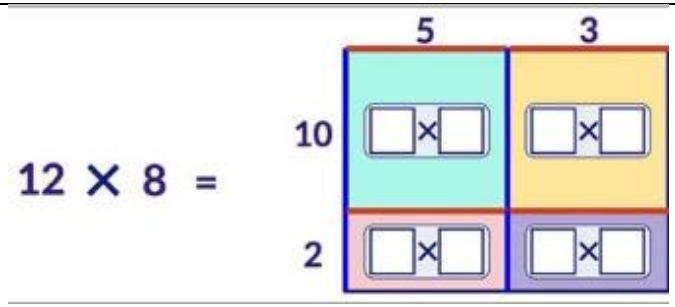
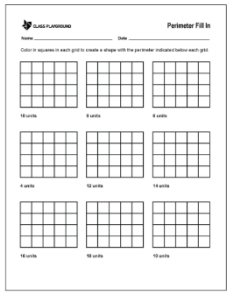
Grade Level Expectations and/or Focus Questions:

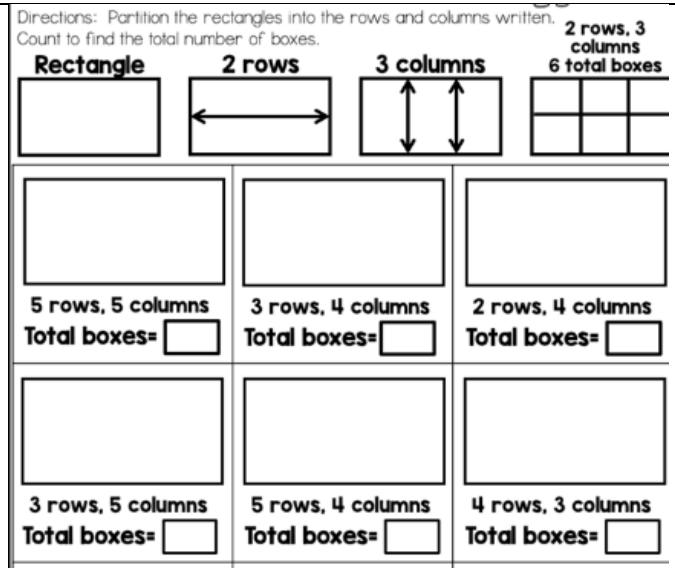
Students will be able to develop and apply language relating to the varied measurement terms, recognise their attributes and understand the different concepts of measurement

specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies
Perimeter **<u>Knowledge</u>** 1. Use appropriate Vocabulary and apply language to the measurement of Perimeter 2. recognize perimeter as a measurement of length 3. recognise perimeter as a measurement attribute of plane figure 4. use language relating to measurement of area 5. recognise area as a measurement attribute 6. recognize area as an attribute of plane figures (2D shapes) Skill: 7. partition a rectangle into rows and columns of the same squares and count to find the total area.	**Pair Activity (SCO 1 & 2)** **Have students in pairs compare two similar objects in the school environment in terms of height and width using non-standard units of measure such as handspan, foot span, finger width, palms, a thread, or a rope (examples plants, their pencils, books shown below)**  *Retrieved from* https://www.pinterest.com/pin/722053752749144686/ **Checklist** ● Picked two objects (1 per learner) (yes/ no) ● Used appropriate unit of length (yes / no)	Guide students into applying language relating to length, area, perimeter, and time by making comparisons. *Review the concept measuring - Length* Allow learners to compare objects using non-standard units of measure such as handspan, foot span, finger width, palms, a thread or a rope. For example students can in pairs measure the length of their desktop using the handspan. Another example could have each student measure the length of the classroom floor using the footspan. Teacher will record the measurements on the board for comparison. Guide learners into recognising that The length of an object can be found by determining the number of units, laid end to end, that make up the distance from one point to another. For example: 1. How tall are you? 2. How far is the teacher's desk from the door? 3. How long is your shoelace or ribbon?

specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies
	Whole Group activity *(outcomes 3 & 4)* Have students identify objects (chalkboard, door, plants, furniture, floor) in their immediate environment that are measurable in terms of perimeter Checklist ● Learner identified at least one object. (yes/ no) **Pair Activity: *(SCO 3)*** Students will use a dictionary and find the meaning of the terms perimeter Each pair will explain their definitions to the rest of the class using physical objects around the classroom. **Checklist** ● Each pair successfully defined the perimeter (yes/ no) ● Each pair used appropriate objects to explain definition yes /no **Entrance Slip - Product *(SCO 5,6&7)*** a) Find the number of whole squares in each shape below. b) Calculate the total area of each shape below	Have two students stand back to back and compare their height. Consider How: long/wide/high/deep/far is it? Length, Width, Height, Depth, Distance *(Refer to Additional Useful Content for more examples)* **Discovering Perimeter (SCO 1, 2 &3)** Provide students with square tiles and Ask students to make a rectangle with their four square tiles. (Some will make a 2×2 array, while others will make a 1×4 or 4×1).  *Retrieved from https://youtu.be/e9va8MBvYR4"* Retrieved: https://youtu.be/e9va8MBvYR4 Have students walk one round around the classroom, playing field or school building to lead them to the concept of perimeter. It

specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies
	 *Retrieved from* **https://mrslongs3rd.weebly.com/uploads/2/0/9/8/20984166/ch-19-review-p1_orig.png** **Checklist** ● Learner accurately counted all the whole squares in at least 2 shapes (yes/ no) ● Learner accurately calculated the area of each shape (yes/ no) **Exit Slip - Product *(SCO 5 & 6)*** **Complete the model by placing the missing values**	is measurement of the distance all around a shape Use guide questions to help students discover the meaning of the term Perimeter, for example, Ask students, some of your rectangles have a perimeter of 8, but others of you have a perimeter of 10. Why do you think that is?" give students time to think and discuss together and write their ideas on the board or in their books. Refine and restate students think to lead them to define perimeter as a distance around the outside of a figure. Have students describe measurable attributes of objects in terms of perimeter (A perimeter measurement is a length measurement). Describe several measurable attributes of a single object (length and width). (A) Have Students use the terms perimeter in sentences of their own. eg. …..The perimeter of the court below is less than the perimeter of the classroom. Distribute grid paper and colored pencils to each student and provide opportunities for students to draw different shapes and find

specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies
	 ***Retrieved from*** ***https://cdn.splashmath.com/cms_assets/s/math-worksheets/complete-the-area-model.jpeg*** **Checklist** can accurately compute total area (12 x 8) ● **Leaner can accurately determine the missing figures within the shape** Allow students to partition rectangles into rows and columns. *(SCO 7)*	the perimeter by counting the squares on each side. For example:  *Conceptual Understanding - Introduction to Area* ***(SCO 4,5,6 & 7)*** **Using Manipulatives** Provide students with the opportunity to create polygons using square tiles. Ask students questions to develop the concept of area. For example, "How many square tiles were needed to make your rectangle? How many square units is the area of your shape? Engage students in a whole class discussion about Area to coin a definition that Area is how we measure the space inside a figure. Explain to students that we

specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies
Knowledge 8. use language relating to time 9. recognise time as a measurement attribute 10. explain the meaning and use of time 11. interpret the use of time **<u>Values</u>** 1. show an appreciation for the need for measurements by using correctly terms associated with length, perimeter, area or time 2. value the importance of measurements by describing real-life situations involving length, perimeter, area or time	 ***Retrieved from https://images.google.com/*** **Class discussion: *(SCO 8,9,10 &11)*** **Students talk about their experience relating to the term "time".** In small groups: each will develop sentences using each of the following terms. Teacher observes each group during discussion where a leader will report (one sentence per term)	use square units because we are measuring more than how long something is. Use guided questions to help students describe what we are measuring to find the area of a shape. For example, we are measuring how much surface space it takes up, and we can do that with square units." Have learners cut out a bunch of unit squares, which are then kept in bags. Learners will then use these premade squares to find the area using. *(Refer to Additional Useful Content Knowledge for definition of Area)* *Patrioning* Let students view youtube Video on partitioning. " Same Size Square' https://youtu.be/nyKQ6GMglyA Have students cover a rectangular surface with two or more different sizes of rectangles to be used as the unit of measure (e.g., recipe cards, paper, sticky notes). Ask them to place the rectangles close to each other with no overlaps or gaps. Have them compare the number of each type of unit of measure needed to cover the surface.

specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies
	Terms: early, late, morning, evening, night, to be on time, AM, PM… E.g. I wake up very early to get ready for school. **Checklist** ● **Each group can use at least 5 terms above correctly in separate sentences (yes/ no)** ● **Each group is able to use at least one sentence which incorporates more than one term from the list above (yes/ no)** **Individual work** Students complete the questionnaire.(*does not have to be correct or exact)* **a) Time I get out of bed…...** **b) Time I have breakfast…..** **c) Time I get to school…..** **d) Time Classes begin…..** **e) Lunch time is at…….**	Identify the unit of measure that requires the least number of counts, and the unit of measure that requires the greatest number of counts. Reference:https://www.dcp.edu.gov.on.ca/en/curriculum/elementary-mathematics/grades/g3-math/strand-e/e2 Once students have understood partitioning help them discover that the covering of the surface (area) is an attribute of all plane shapes. It can be measured using square units. Allow them to view video https://youtu.be/zbx2JNqLQXs?si=kG1CWlSiSqHcNeX1 A. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area. B. A plane figure which can be covered without gaps or overlaps by *n* unit squares is said to have an area of *n* square units.

specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies
	f) School ends at….. **g) Why is it important to keep to the time and know the time ? …….** **Checklist** ● Learner is able to estimate each time give and take two hours of reasonable time for questions a, b, c (yes/ no) ● Learner is able to state accurate time for questions d, e and f (yes/ no) ● Leaner is able to give at least one reasonable importance of time (yes/ no)	***Conceptual Understanding - Time (SCO 8,9,10 &11)*** Time is the duration of an event from its beginning to its end. Teacher helps students develop concepts about time by using short scenarios (e.g., "It took us only two minutes to tidy our desks") and the actual time in the context of daily classroom activities – for example, "It will be 10:30 in fifteen minutes. At that time, we will go to the gym." Learning experiences related to time should be ongoing. Teachers should help students estimate, measure, and describe the passage of time, using non-standard units (e.g., find the time it takes for students to form a line by counting the number of times the teacher claps his or her hands) and eventually standard units (e.g., use a stopwatch to find the time it takes to complete a puzzle). ***Open Questioning*** The teacher presents questions and scenarios to which students answer. a) eg: I came to school at 9:30 am.. Would it be early or late for school?

specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies
		b) We go to bed in the ____ c) Time is measure in_____ d) Name two instruments we can read or tell time.

Additional Resources and Materials:

- ***Using Language Stages to Guide the Development of Measurement Concepts | ORIGO Education***
- ***https://www.acleadersresource.sa.edu.au/features/conceptual-narrative-printables/maths/DECD_Mathematics_Conceptual_Narrative_Using_units_of_measurement_F-Year_2_2017.pdf***
- ***https://www.onlinemathlearning.com/understand-area.html***

(teachers will use discretion in viewing part or full length videos based on need)

Additional Useful Content Knowledge for the Teacher:

Informal units of measure are often human related units, such as paces or fingers, but can also be blocks, paper clips, sticks etc. Informal units are sometimes referred to as non-standard units of measure.

• Uniform informal units are informal units that are of the same size as each other. For example the blocks used are all the same as each other.

• Using informal units iteratively means the repeated use of the same unit. For example, moving one paper clip along the length of a shape 10 times, rather than using 10 paper clips in a line

. • Direct comparison is when the two (or more) items that are being compared, are brought together. For example, the pen is laid next to the pencil to compare their lengths. The ball is placed on one side of the balance and the rock is placed on the other side.

• Indirect comparison is when an intermediary is used to make the comparison. Initially the intermediary could be another item. For example, a piece of string could be used to compare the height of the school tables with the height of the table in a child's home. The two items can't be brought together for direct comparison, but they can be compared to each other via the piece of string.

Reference*:* **https://www.acleadersresource.sa.edu.au/features/conceptual-narrative-printables/maths/DECD_Mathematics_Conceptual_NarrativeUsing_units_of_measurement_F-Year_2_2017.pdf**

Perimeter

- Perimeter is the total length or distance around an object or region. A perimeter measurement is a length measurement.
- If a perimeter is made up of straight lines, the parts are measured with a ruler and the measurements are combined. This is an application of the additivity property.
- Curved perimeters are difficult to measure accurately with a ruler. A "go-between," like a string, is used to match the perimeter of the object and then measured. The measurement of the go-between is used as the measurement of the perimeter. This is an application of the transitivity property.
- Different shapes can have the same perimeter. A shape with a perimeter of 20 cm could be a 5 cm by 5 cm square, a skinny rectangle that is 2 cm by 8 cm, or a completely curved shape. To construct a shape with a given perimeter, the amount of length must always be tracked so that the remaining length can be distributed appropriately around the rest of the shape.
- Measurements of continuous quantities, like length, are always approximate. The smaller the unit, the greater the potential accuracy. If different-sized units are used to measure an object, each unit is counted and tracked separately.
- Because measurements are approximate, a combination of units might be used for greater accuracy (e.g., a combination of centimetres and millimetres for a length between 5 cm and 6 cm).
- The appropriate unit of length depends on the reason for measuring an object. Larger units are used for approximate measurements; smaller units are used for precise measurements and detailed work. While non-standard units are appropriate for quick, personal measurements, standard units are used when communicating measurements.

Area:

Young students develop concepts about surface by using a variety of materials to cover shapes. Experiences in covering shapes help students understand how the area of a shape is different from the length or perimeter of a shape. Initially, students may leave gaps or may overlap materials when they cover the surface of a shape, and they may not recognize the importance of using a consistent unit.

Time:

Because time is intangible, it is an abstract concept for young students and can be difficult for them to understand. Teachers can help students develop concepts about time by referring to the passage of time (e.g., "It took us only two minutes to tidy our desks") and to the actual time in the context of daily classroom activities – for example, "It will be 10:30 in fifteen minutes. At that time, we will go to the gym." Learning experiences related to time should be ongoing. Teachers should help students estimate, measure, and describe the passage of time, using non-standard units (e.g., find the time it takes for students to form a line by counting the number of times the teacher claps his or her hands) and eventually standard units (e.g., use a stopwatch to find the time it takes to complete a puzzle). Teachers should also provide students with opportunities to read digital and analogue clocks, and to relate daily events to certain times of the day (e.g., "Recess begins at 10:30 and ends at 10:45").

Definitions For students:

Area : ***the amount of surface within a closed shape.***

Time: ***the duration of an event from its beginning to its end***

Opportunities for Subject Integration:

- estimation in rounding off numbers
- measuring the length of 2D and 3D shapes
- finding perimeter of 2D shapes
- identifying patterns and angles on the analogue clock
- using the concept of time to collect data
- analysing statistical data involving time

Strategies that Support the Curriculum and Assessment Framework

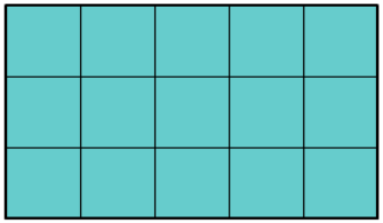
Elements that are integrated across subjects:

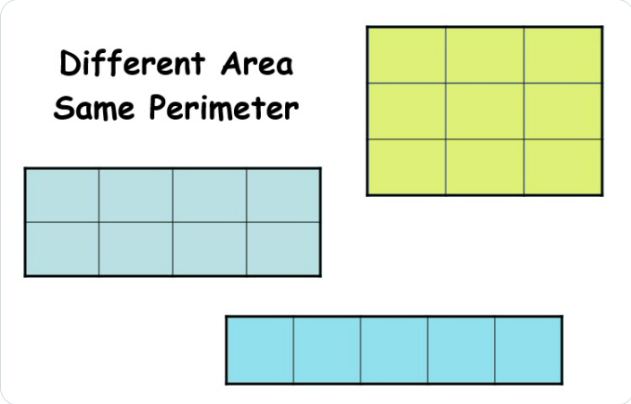
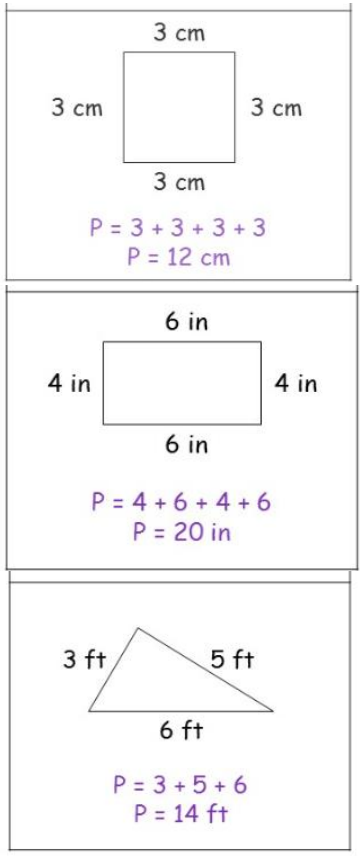
Elements from Local Culture, Technology, TVET, Environment that are integrated:

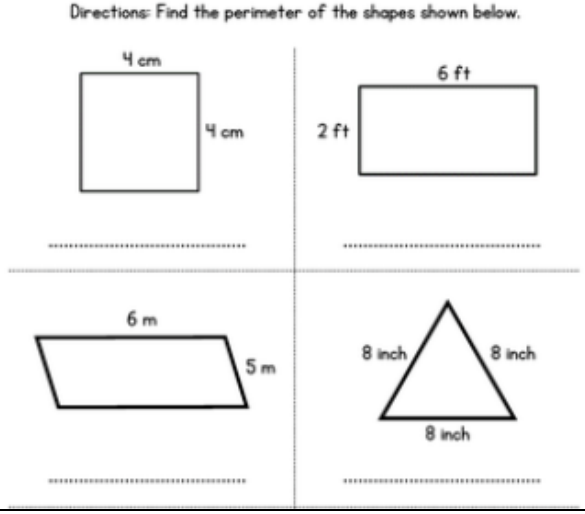
Items of Inspiration (teaching tips, inspirational passages, connections to educational research)

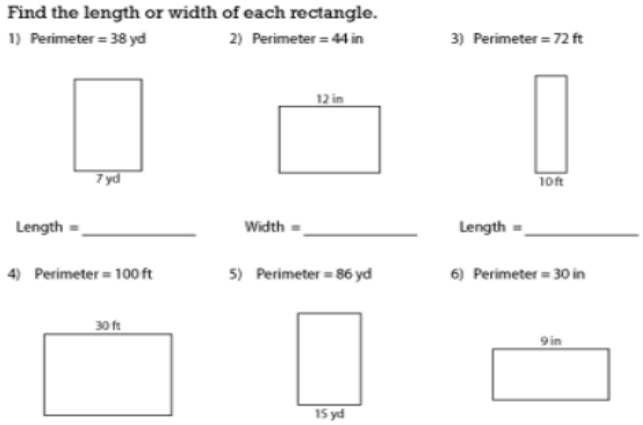
Measurement ELO M1.2

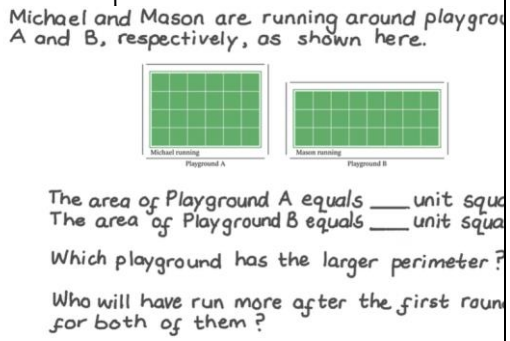
Introduction to the Subject:
Strand (Topic): Measurement
Essential Learning Outcomes M1.2 : ***Comparing and ordering based on measurable attributes***
Grade Level Expectations and/or Focus Questions: *Learners will be able to solve real world mathematical problems involving perimeter and area of polygons.*

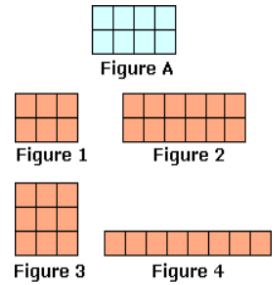
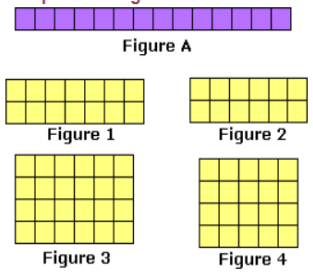
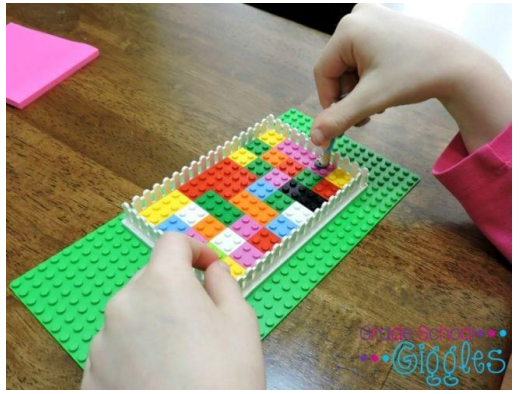
Specific Curriculum Outcomes	**Inclusive Assessment Strategies:**	**Inclusive Learning Strategies:**
Learners will be expected to: **<u>Knowledge</u>** 1. differentiate between the terms perimeter and area of a shape 2. calculate the perimeter of a polygon given its side lengths. 3. find the unknown side length of a polygon. 4. exhibit rectangles with the same perimeter and different areas 5. exhibit rectangles with the same area and different perimeters.	**Product Entrance Slip *(SCO 1)*** Find the area and perimeter of this shape by counting the squares.  Retrieved from <u>https://www.turtlediary.com/quiz/area-of-rectangles-by-tiling.html</u> **Checklist** ● Learner is able to determine premier accurately **(yes/ no)**	**Learners will be using guided discovery to compare the concepts of area and perimeter of plane figures and 3D shapes** ***Discovery through play - Online Game activity (SCO 1)*** Allow learners to play interactive online games to help them relate to the concept of area

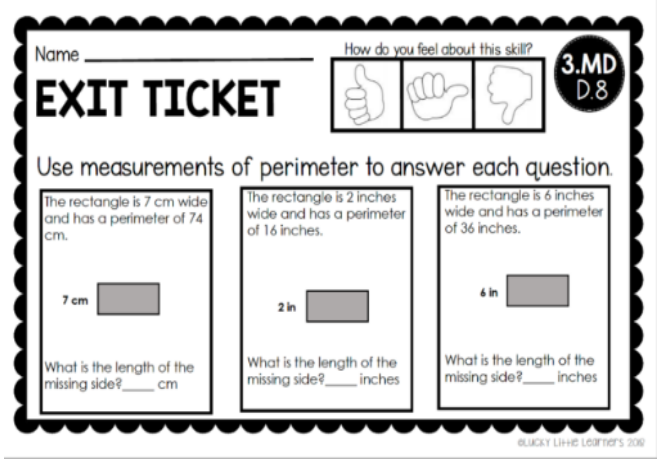
Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Values 6. Collaborate with peer to solve problem, that rectangles with the same area can have different perimeters and vice versa 7. Justify the importance of perimeter and area by using them to solve everyday problems.	• Leaner is able to determine area accurately **(yes/ no)** **Group Work**: ***(outcomes 1 and 4)*** Place students in groups and give them the dimensions to draw atleast 3 different rectangles with the same perimeter as shown in the diagram below. Allow groups to compare their rectangles, taking note that they have the same perimeter but different areas. Encourage discussions on why this is possible.  **Retrieved from https://twitter.com/pickover/status/1620492709017550848** Do similar activities for rectangles with the same area but different perimeters.	***Conceptual Understanding - Varied exercises involving the calculation of perimeter (outcomes 1, 2 &3)*** 1. Provide students with opportunities to calculate the perimeter of polygons-quadrilaterals and triangles-given diagrams of these with the measurement for each side. 

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Checklist ● Learners can draw 1-2 rectangles given dimensions **yes/ no** ● Learners can draw more than 2 rectangles given dimensions **(yes/ no)** ● Learners can compare perimeters **(yes/ no)** ● Learners can contrast area **(yes/ no)** **Product- Activity Sheets** ***(outcomes 2& 3)*** Give learners activity sheets where they are to calculate the perimeter of various polygons. In some cases, learners will need to find the missing side lengths of the polygon in order to calculate the perimeter. .  	**Retrieved from https://vibrantteaching.com/how-to-find-perimeter-in-3-easy-ways/** 2. Let students draw their own shapes and then calculate the perimeter using non-standard and standard units. 3. Give students opportunities to calculate the missing side of a polygon, given the perimeter and other sides. ***Discovery - Finding Perimeter (outcome 2)*** Show students a video on how to find the perimeter of common polygons like rectangles and squares. Have them measure each side, add the lengths together, and calculate the perimeter. Math Antics - Perimeter ***Hands-on Exploration (outcome 2)*** : Provide students with 3D shapes made out of cardboard (prisms, cuboids, and cubes). Have them measure the side lengths of their faces and calculate the perimeter using non-standard units (hand span, straws, paperclips, etc.). These measurements can then be compared to standard units.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Retrieved from https://www.tes.com/teaching-resource/geometry-worksheets-perimeters-of-2d-shapes-12740298 **Checklist** ● Learners can accurately determine at least ¾ perimeters **(yes/ no)** For this activity sheet, learners will use the given perimeter and length of one side to calculate the missing length or width of each rectangle.  **Retrieved from https://www.tutoringhour.com/worksheets/perimeter/rectangles/length-width/** **Checklist**	***Comparing area and perimeter of rectangles (outcomes 4 &5)*** ● Allow learners to explore the idea of the perimeter and area of concrete shapes. Have them use string to measure the border/boundary/perimeter of the shapes. Allow them to colour/shade the surface of the shapes to identify their area. Classroom objects can be used to ask students to determine whether the teacher is referring to perimeter or area, e.g. The border of the chalkboard, the surface of your desk; How much paint do we need to paint the wall of the class?; We need to make a frame for this picture. ● Geometric Art:. Provide students with graph paper and colored pencils, and ask them to create rectangles with the same area but different perimeters. https://www.sheppardsoftware.com/math/geometry/area-shape-game/ ***Problem Solving (SCO 4 & 5)***

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	• Learners can accurately determine at least ⅗ missing lengths or widths **(yes/ no)** **Hands-On Measurement Stations *(SCO 6 & 7)*** Set up stations with various polygons and measuring tools. Students rotate through the stations, measuring side lengths and calculating perimeters and areas. Assessment can be based on their accuracy and ability to explain their methods. **Checklist** • Learners can determine perimeters accurately **(yes/ no)/somewhat** • Learners can areas accurately **(yes/ no)/somewhat** • Learners can compare and contrast areas and perimeters **(yes/ no)/somewhat** **Think, Pair, and Share *(SCO 6 & 7)*** Have students work in pairs to compare and identify shapes with the same area but different perimeters and those with the same perimeter but different areas.	Show students a video where they are to solve real world problems comparing areas and perimeters  Retrieved from https://www.nagwa.com/en/videos/849153701784/ Include other real world perimeter applications, such as fencing a yard, measuring around a pool, etc. Utilize interactive geometry software to explore area and perimeter. https://toytheater.com/area-perimeter-explorer/ https://toytheater.com/geoboard/ Show students images of rectangles with the same area but different perimeters.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Q1 Which of the figures has the same perimeter but a different area compared to Figure A?  A. Figure 3 B. Figure 4 C. Figure 1 D. Figure 2 Q2 Which of the figures has the same area but a different perimeter compared to Figure A?  A. Figure 3 B. Figure 1 C. Figure 2 D. Figure 4 **Retrieved from http://www.icoachmath.com/topics/3rd/Rectangles-with-Same-Area-but-Different-Perimeters-and-Same-Perimeter-but-Different-Areas.html** **Checklist**	Ask them to explain how this is possible. Explore the area and perimeter with Lego blocks or empty matchstick or cereal boxes from home.  **Retrieved from https://www.weareteachers.com/area-and-perimeter/**  Retrieved from https://smart-packaging-usa.wixsite.com/home/post/you-

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	• Learners are able to accurately identify the correct figure for questions 1 **(yes/ no)** • Learners are able to identify the correct figure for question 2 **(yes/ no)** **Product Exit Slip**  Name _____ How do you feel about this skill? EXIT TICKET 3.MD D.8 Use measurements of perimeter to answer each question. The rectangle is 7 cm wide and has a perimeter of 74 cm. 7 cm What is the length of the missing side?____ cm The rectangle is 2 inches wide and has a perimeter of 16 inches. 2 in What is the length of the missing side?____ inches The rectangle is 6 inches wide and has a perimeter of 36 inches. 6 in What is the length of the missing side?____ inches ©Lucky Little Learners 2016 **Retrieved from https://shop.luckylittlelearners.com/product/3rd-grade-exit-tickets-measurement-data-3-md-d-8-version-2/** **Checklist** • Learners can accurately determine solutions for ⅔ questions **(yes/ no)**	cannot-imagine-how-useful-are-those-useless-empty-cereal-boxes

Additional Resources and Materials:

paperclips, match sticks, tooth picks, activity cards, lego blocks, cereal boxes, graph paper

(teachers will use discretion in viewing part or full length videos based on need)

Additional Useful Content Knowledge for the Teacher:

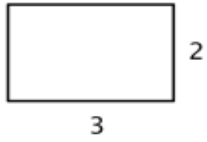
Definition for students

The measurement of area and perimeter are widely used in everyday life, such as measuring the size of a room by talking about its floor area, or how much fence to put around a playground.

- Perimeter refers to the total distance around the boundary of a polygon.
- Area refers to the space enclosed within the boundary of a polygon.

All rectangles of a given area do not always have the same perimeter.

Hooray! Another winner! We found one! Is that all of them?



Perimeter of 10 and area of 6. Doesn't work.

Retrieved from https://mathpractices.edc.org/pdf/Rectangles_with_the_Same_Numerical_Area_and_Perimeter.pdf

Opportunities for Subject Integration:

-addition and multiplication of numbers
-measuring the length of 2D and 3D shapes
-finding perimeter and area of 2D shapes
-completing patterns involving area and perimeter of rectangles
-analysing statistical data involving area and perimeter of rectangles

Strategies that Support the Curriculum and Assessment Framework

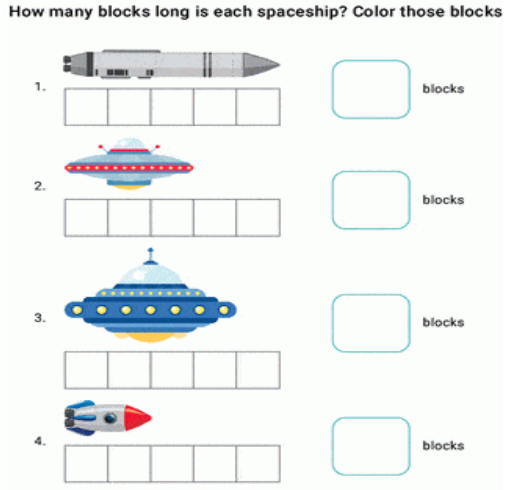
Elements that are integrated across subjects:

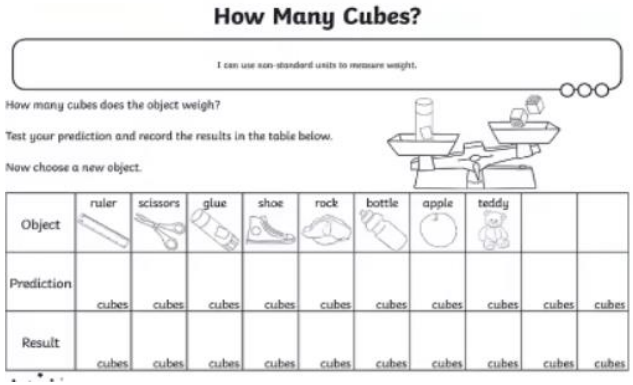
Elements from Local Culture, Technology, TVET, Environment that are integrated:

Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

Measurement ELO M1.3

Introduction to the Subject:
Strand (Topic): Measurement
Essential Learning Outcomes M1.3 & M2.3 ***Developing and applying non-standard units of measure***
Grade Level Expectations and/or Focus Questions: *Learners will be able to use non-standard and standard units of measurement to estimate, measure, and compare the mass of various objects.*

Specific Curriculum Outcomes:	**Inclusive Assessment Strategies**	**Inclusive Learning Strategies**
Learners will be expected to: **<u>Knowledge</u>** 1. explain the effect that overfilling, underfilling and gaps between units have on accuracy 2. Compare the mass of various objects using a pan balance and non-standard units. 3. Estimate the mass of various objects using a pan balance and non-standard units. **<u>Skills</u>**	**Entrance Slip *(SCO 1)*** 	**Learners will be guided into using non-standard units of measurement to explore the mass of objects** Show students videos on measuring mass and using non standard units. https://www.youtube.com/watch?v=PO8ItHHKzbw ***Discovery - Using Non-standard units to measure Mass (outcome 2)*** Have students predict the mass of an object using non-standard units such as

Specific Curriculum Outcomes:	Inclusive Assessment Strategies	Inclusive Learning Strategies
4. measure the mass of various objects using a pan balance and non-standard units. **Values** 5. Recognize the importance of accuracy when measuring by comparing the mass of objects when overfilled, underfilled, and exact. 6. Compare the mass of two objects 7. Compare unit mass in grams and kilograms. 8. Use kilograms or grams as a unit of mass. 9. Identify situations in everyday life where grams/kilograms is the most appropriate unit of measure.	Retrieved from https://www.k5learning.com/free-preschool-kindergarten-worksheets/measurement/non-standard-units **Checklist** ● Learner is able to estimate accurately the length of ¾ spaceships **(yes/ no)** Group Work *(SCO 2, 3, 4 & 5)* Predict the mass of various objects using non-standard units such as cubes. Using a pan balance, weigh the objects to get the correct answer. In pairs, allow learners to compare their predictions with the correct answer as well as their answers with those of other groups.  **How Many Cubes?** I can use non-standard units to measure weight. How many cubes does the object weigh? Test your prediction and record the results in the table below. Now choose a new object. Object: ruler, scissors, glue, shoe, rock, bottle, apple, teddy Prediction: cubes Result: cubes	cubes, marbles, or stones. After each prediction, allow students to use the nonstandard unit to measure and compare. ***Discovering Overfilling, Underfilling, and Gaps with Containers*** ***(SCO 3)*** **Objective**: To understand how overfilling, underfilling, and gaps can affect the mass of an object. Materials: A set of containers (e.g., jars, beakers, cups) Small objects (e.g., marbles, beads, sand) A balance or scale Measuring spoons or cups Objects of known mass (e.g., small weights) Procedure: Place the balance or scale on a stable surface. Choose one of the containers and weigh it using the scale. Record its mass.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Retrieved from https://www.twinkl.com/resource/t-n-5424-how-many-cubes-weight-activity-sheet **Checklist** Learners are able to estimate within 3 cubes the capacity of at least 6 objects **yes /no** **Inclusive Assessment Strategies:** (*Connected back to the Principles of Assessment*) ***Practical Assessment***  You can place children in small groups. Have them put on the balance the flour and the butter which should be placed on each side. Have them tell which is heavier and which is lighter.	Fill the container with a specific amount of small objects (e.g., marbles) up to the rim, ensuring there are no gaps and it's not overfilled or underfilled. Weigh the container with the objects and record the new mass. Repeat the process using the same container but with gaps between the objects, and then with the container either overfilled or underfilled. Discuss the results with the students. Compare the masses of the containers in different scenarios (no gaps, gaps, overfilled, and underfilled). Emphasize how the arrangement of objects inside the container affects the mass. ***Guided Discovery*** Present an apple and a marble to the class. Hold marble in one hand and the apple in the other hand. Answer questions: Which is heavier? ……. Which is lighter?

Specific Curriculum Outcomes:	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Let them pick up these objects from the table estimate them then put on the balance provided to see if they are less than or more than 1 kilogram. Record your answers ***<u>Oral Assessment</u>*** This assessment will be done orally while teacher observe and record. In this activity the teacher would three boxes of the same size. Each box will weigh different kgs. For example one box could weigh 1 kg, the next 2 kg, 3kg. The teacher would probe students to tell what material is in each box.. Each Student can write their answers in their notebooks. Students would be asked to give reasons why they choose this answer.  	  Use other materials to find out how much of the lighter is about the mass of the heavier. Use a beam balance to find out if the answer is correct Present balance.  Retrieved from: https://www.ebay.ca/itm/385291908919 Do you know what is this? What is it used for? How can we use it to find out which is lighter? Can you now use it to see if your answer was correct?

<table>
<tr><th>Specific Curriculum Outcomes:</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
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googleimages.com

<u>Practical Assessment</u>

Things that weighs more than 1 kg or less than 1kg and can be found in or on
<table>
<tr><td>places</td><td>less than 1 kg</td><td>more than 1 kg</td></tr>
<tr><td>school</td><td></td><td></td></tr>
<tr><td>supermarket</td><td></td><td></td></tr>
<tr><td>stores</td><td></td><td></td></tr>
<tr><td>boats</td><td></td><td></td></tr>
<tr><td>home</td><td></td><td></td></tr>
<tr><td>airport</td><td></td><td></td></tr>
<tr><td>boxes</td><td></td><td></td></tr>
</table>
</td>
<td>
When using the balance how do we know when each one is lighter, heavier or the same mass?

Retriefed from: https://stock.adobe.com/search?k=balance+scale+graphic Heavier lighter

The lower one is heavier

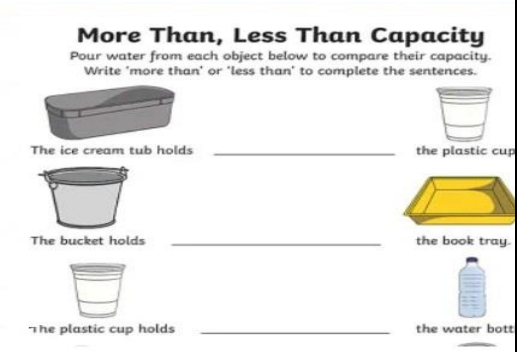
If the balance is like this what can we say about the two materials?

</td>
</tr>
</table>

Specific Curriculum Outcomes:	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Why do we use a scale in the places stated in the table? (school, supermarket, stores, boats, home, airport)	Present a bag of flour to the class. Examine the bag and tell how much does the flour weigh? It can be found on the bag. Record the information given by the child. Introduce the word kilogram and gram. Teacher can use the gram song to reinforce the lesson. This can be found by the link provided: https://www.youtube.com/watch?v=5IiULgFEOwY ***Guided Discovery*** Provide weights of 1 kilogram and 1 gram.   Put the gram on the balance then the kilogram weight on the balance. What happen to the balance? Why do think it happen? Investigate the number of grams that equals 1kilogram. Put two 500g on one

Specific Curriculum Outcomes:	Inclusive Assessment Strategies	Inclusive Learning Strategies
Capacity **<u>Knowledge</u>** 1. use non-standard units to estimate the capacity of various objects. 2. use non-standard units to compare the capacity of various objects. **<u>Skills</u>** 3. use non-standard units to measure the capacity of various objects.	***<u>Oral/Observation.</u>*** You can have students talk about home and school and indicate where they use litres and millilitres. Student would record information. Students could give examples also. Monitor what the children has and record using a checklist.Teacher would solicit	side of the balance and 1 kilogram on the other side. How many grams equal a kilogram. List some objects That you think has more than 1 kilogram in mass. List some objects that you think has less than 1 kilogram in mass. What situations at home would we need to know the mass of the flour? Can you think of other places or situations where we would need to know the mass of something? What situations at home would we need to know the mass of the flour? Can you think of other places or situations where we would need to know the mass of something? In groups the students will carry out the following activity. Exploring Capacity using non standard units **(SCO 1-3)**

Specific Curriculum Outcomes:	Inclusive Assessment Strategies	Inclusive Learning Strategies
4. Estimate and measure the capacity of containers using litres and millilitres. **Value** 5. Volunteer to explain why there is a need for millilitres as a unit of measurement for capacity. 6. Describe situations in real life where the litres and millilitres are used as unit of measurement.	from students if there is any other place where these measurements are used? Millitres and litres in real life For example: | Name	Measures objects correctly		Comments
	Yes	No	
			| ***Practical Assessment*** Students would be given three different drink recipes • lime drink • kool- aid • chocolate drink They would be placed into groups to make these. Children can report on this activity. ***Pencil/Paper Assessment*** Grandma made a chocolate drink without using these instruments. The drink came out perfect how was she able to do that? Student write a short paragraph explaining the process of measuring the milk for the chocolate drink. ***Rubric*** **All the steps to measure listed – 5 marks** **Have some of the steps – 3-4 marks** **Little evidence of steps- 0-2 marks**	Students will use objects from home (bottles, bowls, cups) to compare their capacity in the following activity.  Retrieved from https://www.twinkl.com/resource/au-tivin-556-more-than-less-than-capacity-activity-sheet Present students with a container of water, a litre cup, a bottle, water bottle, plastic jug, a mug Watch the Measuring Capacity video on YouTube (https://www.youtube.com/watch?v=GwWRFgWb2xs). Afterwards, revise and discuss the task that was being performed in the video and how it was completed. Provide opportunity for students to estimate how many cups of water each

Specific Curriculum Outcomes:	Inclusive Assessment Strategies	Inclusive Learning Strategies
		container holds. They would then record the information found. Students will then fill the different containers using the cups. Students would record their findings Answer the following questions: a) Which container holds the most? b) Which container holds the least? c) Which holds more than the bowl? d) Describe the activity you have just done? e) What have learnt? **SCO 4** Provide opportunities for learners to carry out to measure capacity using standard units. For example spoons (millilitre), cups and glasses  *Retrieved from: https://www.splashlearn.com/math-vocabulary/measurements/liquid-measurement-chart*

Specific Curriculum Outcomes:	Inclusive Assessment Strategies	Inclusive Learning Strategies

Additional Resources and Materials

Nonstandard units- beads, paper clips, toothpicks, marbles, stones, beans, straws. **L**itre cup, millilitre spoon, jug small bucket, bowl, jug and any other containers

(teachers will use discretion in viewing part or full length videos based on need)

Additional Useful Content Knowledge for the Teacher:

For students

Mass refers to the weight of objects, and is usually measured in grams and kilograms. This can sometimes be confused with weight, however they are different! Weight is the gravitational force upon an object. In other words, gravity causes a mass to have weight.

Capacity is the amount that something can contain.

Non-standard units of measurement for capacity include cubes, marbles or stones, etc. They do not give exact measurements.

Retrieved from

https://www.google.com/search?q=capacity%2C+mas+and+weight&sca_esv=f37637c6fdde7f48&ei=S2uxZd2VAcSHkvQPhq-

Opportunities for Subject Integration:

-comparing whale numbers

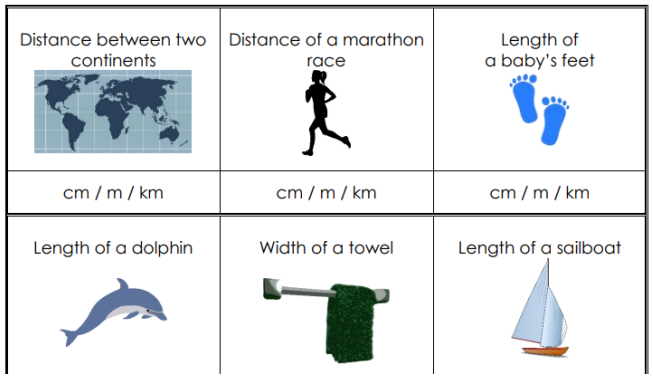
-matching objects to appropriate units of mass

-grouping containers with similar capacity

-analysing statistical data involving mass, weight, or capacity
Strategies that Support the Curriculum and Assessment Framework **Elements that are integrated across subjects:** **Elements from Local Culture, Technology, TVET, Environment that are integrated:** **Items of Inspiration (teaching tips, inspirational passages, connections to educational research):**

Measurement ELO M1.4

Introduction to the Subject
Strand (Topic): Measurement
Essential Learning Outcomes M1.4: ***Learners will be able to understand what and how we measure by applying standard units of measurement.***
Essential Learning Outcome M2.1, M 2.2, 2.2 , 2.4: ***Applying Techniques, Tools and Formulas for Measuring – Developing Personal Referents for Measuring Attributes***
Grade Level Expectations and/or Focus Questions: *Learners will be able to estimate length, perimeter, area and time and measure using standard units of measurement.*

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Learners will be able to: **Knowledge** **Perimeter** 1. determine suitable standard units of length: centimeters (cm), meters (m), decimetre (dm) for measuring objects or distances 2. estimate the length of any given object using standard units: centimetres cm, m, dm 3. estimate the perimeter of a shape using (cm, m, dm).	**Product Assessment** ***(outcome 1)*** Circle the proper units.  Retrieved from https://www.k5learning.com/free-math-worksheets/third-grade-3/measurement/units-of-length	**Guide students into using the standard units of measurement: cm and m. Ensure that manipulatives are used, a metre and centimetre ruler. The teacher helps students understand what a centimetre is using a ruler and that a 100 centimetre is equivalent to 1 metre.** ***Conceptual Understanding - Estimating length (outcomes 1& 2)*** Guide students to identify the best unit for measuring a given length using the 30 cm and metre rulers.

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
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4. find the perimeter of a shape using (cm, m, dm

5. Determine measures of perimeter by developing and applying strategies without the use of formulae using standard units
6. Identify at least one strategy (not the formula) they can use to find the perimeter of rectangles, triangles and parallelograms

<u>Skill</u>
7. measure the length of an object using standard units of measurement (cm, m and dm)

8. record the estimated length of any given object using cm and m.

<u>Values</u>
9. Justify that objects come in various standard length units by measuring.

<u>Knowledge</u>
</td>
<td>
Checklist
Learners are able to determine at least 4/6 suitable standard units of measurement (yes/ no).

Product Assessment (outcomes 1 & 2)
Given a list of items, students will estimate the length.
<table>
<tr><td>Object</td><td>Estimated Length</td></tr>
<tr><td>Desk
classroom window
your bed
the chalkboard</td><td></td></tr>
</table>
Checklist

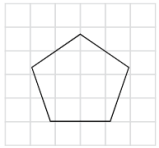
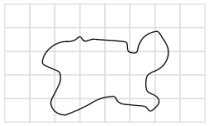
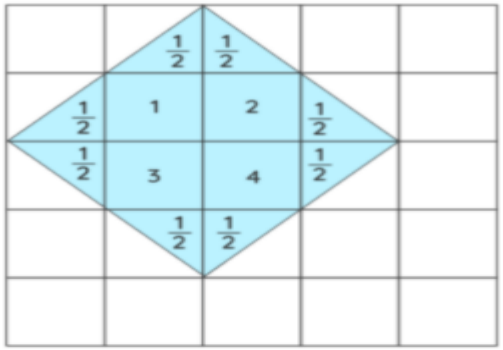
Learners are able to estimate the length of at least ¾ objects.

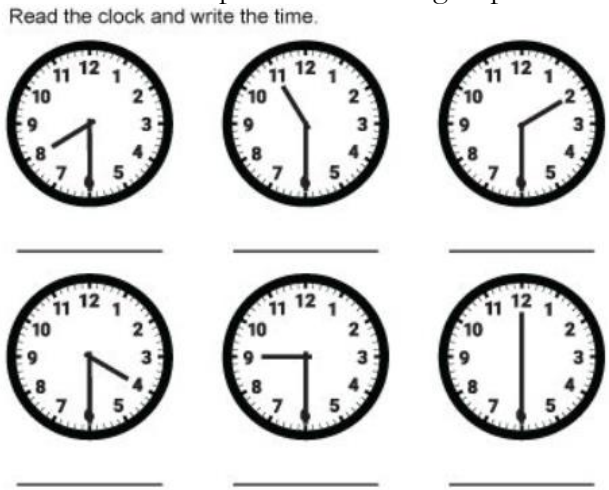
Group Work (outcome 3 & 4)

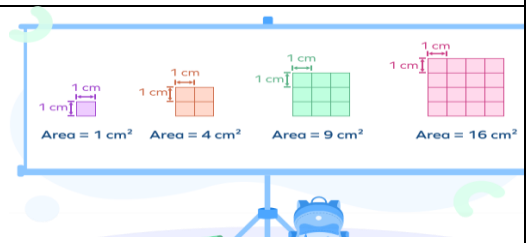
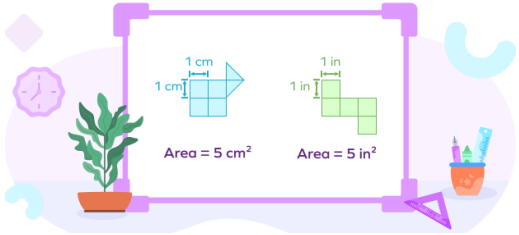
In groups of threes, students will measure places or objects in the immediate environment.
</td>
<td>
Have students view videos (Estimating Length in Centimetres and Metres). <u>https://youtu.be/d5amyeF10cs?si=GjF7egRsVayZiFZP</u>
Have students estimate the length of items/objects in their classroom and home environment.

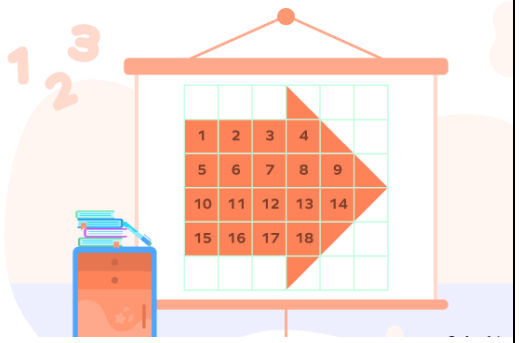
Measuring (outcome 3 & 4)
The teacher explains to students how measurement is done. Have the Student view the video on measuring using a centimetre ruler.
</td>
</tr>
</table>

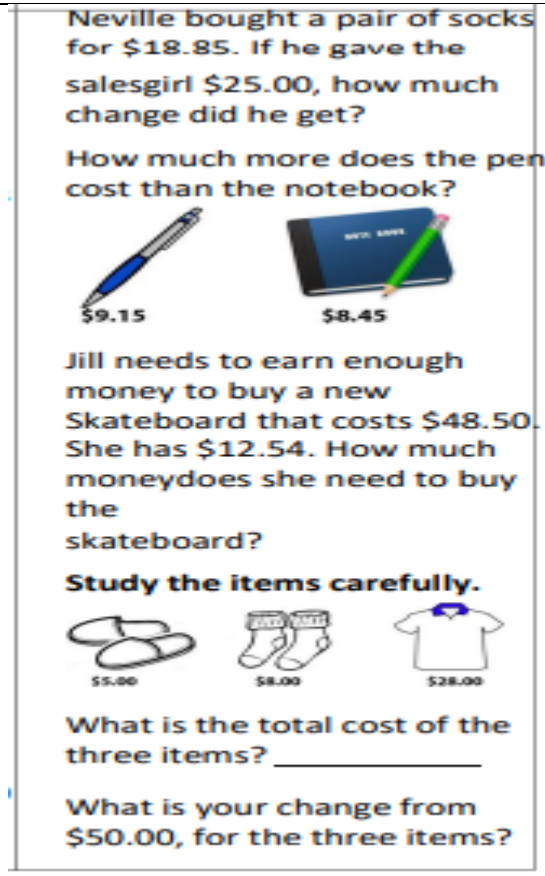
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
10. estimate the area of geometric shape using standard units of sq. cm, sq. m and sq. dm **Skills** 11. measure the area of a geometric shape using standard units (sq. cm, sq. m and sq dm) 12. Determine measures of area by developing and applying strategies without the use of formulae using standard units 13. Identify at least one strategy (not the formula) they can use to find the area of rectangles. **Values** 14. Demonstrate and explain using examples that a given area can have many perimeters and vice versa	E.g. Measure the length of the school corridor, the chalkboard Allow students to measure items estimated in previous lessons or places of choice. **Checklist** Each group measures and records accurately at least 2 objects or distances, **each** suitably measured in cm, m and dm. **Exit Tickets *(outcomes 6 & 7)*** Call students in front of the classroom. To return to their seat, students must accurately calculate the perimeter of a given shape. **Checklist** ● Learner identifies an object or distance to calculate perimeter **(yes/ no)** ● Leaner accurately calculates perimeter using cm, m or dm **(yes/ no)** **Pair Activity *(SC0 7)*** Students are given a ruled square paper. On that paper, they will draw a shape using the whole square. Students will then exchange papers. Each student will count and record the area of the shape drawn by the student. **Checklist** ● Leaner is able to draw a shape **(yes/ no)** ● Learner determines the area of shape drawn **(yes/ no)**	*https://www.mathswithmum.com/measuring-centimetres-using-a-ruler/* *Adapted from* *https://education.gov.dm/images/documents/curriculum_guide/Mathematics%20Curriculum%20Guide%20Grade%203.pdf* Have students measure the actual length of objects estimated in previous lessons. **Cooperative learning - Estimating and Finding Perimeter in cm, m, dm) *(outcomes 6 &7)*** Which sentence best defines perimeter? a. the size of the edges b. the total length of the outside of a shape In peers, students will estimate the perimeter of a given shape. One student guesses and the other student calculates the perimeter. Have students switch roles so each person gets an opportunity to estimate and calculate. Students are told a story in which Chad has two cards: a red and a blue. The red card is 4 cm wide and 9 cm long. The blue card is 6 cm wide and 8 cm long. Chad wonders which of the two cards has the longest distance around it. Students are asked to help Chad solve

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Individual Product Activity *(outcomes 7&8)* Students complete a worksheet on finding an area. • using square centimetres to estimate and measure the area of a variety of polygons:  • using square centimetres to estimate and measure the area of a variety of curved shapes:  **Checklist** ● Learners can estimate area of each shape within 5 sq cm ● Learners can accurately find area of each shape 	the problem by drawing the cards and then measuring the distances using a string or a ruler. The teacher explains that we are trying to find the perimeter. Guide students into defining what perimeter means. Using measured lengths of the classroom, students will be led into calculating the perimeter of the classroom and other shapes in the environment and text. Teacher guides. **See Students Mathematics Text for suggested practice activity(ies).** **Discovery - Estimating and finding Areas *(outcomes 8 & 9)*** Now that students are able to measure the length of shapes. Teacher will guide students into finding an area. Have students look at the video: Area of a Shape on a grid. This will guide students into deducing that the area is the space enclosed by the boundary of a plane figure. https://youtu.be/p8gblx7QY24?feature=shared

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Time **15.** State the relationship between **a)** days and weeks **b)** weeks and months **c)** minutes and hours 16. Interpret information on a calendar 17. State and record time on the analog and digital clocks in the following intervals: (a) hour (b) half-an hour (past and to) (c) quarter-hour (past and to) (d) five minutes (past and to) - Solve Problems involving time. 18. Solve problems involving elapsed time **Skills**	Retrieved from https://www.cuemath.com/measurement/area/ **Group Activity *(outcome 9)*** Have students complete activities in groups.  https://toytheater.com/clock/ **Checklist** Leaner can read write the time from 4/6 analogue clocks. **Pair Activity *(outcome 10 &11)***	Teacher guides students to the formula using the grid paper and with the definition of area as the number of square units inside the shape to show the reason area is measured in square units. Teachers practice activities using printed worksheets. Students are guided to find the area of each figure. Allow students to use square tiles to find the area of a selected area in their environment (desks, books, devices). Teacher guides students to ensure that the entire area is covered. Students are given a marked area to measure using a meter ruler. Have students measure the length and width of the area. Teacher then guides students into calculating the area by multiplying the length by the width. Remind students that the area is written in cm/m squared. To determine the area of the square figures drawn below, draw unit squares of 1-centimetre sides. Thus, the shape will be measured in cm2, also known as square centimetres. (Splashlearn.com)

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
19. Solve problems involving time using the different number operations. **<u>Money</u>** **Knowledge** Students should be able to: 20. Identify the coins and notes in circulation up to the $100 note. 21. Read and write amounts up to $100. 22. Represent the value of coins in dollar(s) and cent notation when given an assortment of coins. 23. Determine the value of various assortments of coins and notes up to $20.00 24. Solve problems involving money by using the arithmetic operations to determine: (a) sums/totals (b) differences/change (c) products 25. Simulate: purchasing up to three items (a) giving correct amounts not exceeding $20.00.	In pairs, working using a real clock, one student will be allowed to call out a time while the other shows the time on the clock. Each pair will do an o'clock and a half past the hr Allow students to play online game **Checklist** • Learner can read the time using o'çlock and half past the hr (yes/ no) • Learner can show the time using o'clock or half past the hour **(yes/ no)** **Interactive activity *(outcomes 13 & 14)*** Students will select items for purchase in the class shop, they will total items and say how much each item will cost. **Checklist** • Learner is able to state the cost of at least 2 items selected • Learner is able to total the cost of items selected **Individual work *(SCO 14 & 15)*** Have students calculate total prices for given items and change they'd receive if they paid using a given amount.	 Here, the area of the shapes above will be measured in square meters squared and square inches. Retrieved from https://www.splashlearn.com/math-vocabulary/geometry/area  Retrieved from https://www.splashlearn.com/math-vocabulary/geometry/area How to calculate the area if there are half unit squares in the grid.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
26. estimate totals for cash transactions involving amounts less than a dollar 27. estimate totals for cash transactions involving whole dollar amounts 28. calculate the change amounts for simple cash transactions involving whole dollar amounts and less than one dollar.	**Checklist** ● Learner is able to total the cost of at least 2 items selected (yes/ no) ● Learner is able to calculate change from a given amount (yes/ no) **Product Assessment** ***(outcome 14 &15)*** Students complete a worksheet.	**Step 1**: Count the full squares.  Retrieved from https://www.splashlearn.com/math-vocabulary/geometry/area There are 18 full squares. **Step 2:** Count the half squares. On counting, we see that there are 6 half squares. **Step 3:** 1 full square =1 square unit So, 18 full squares =18square units 1 half square =½ square unit 6 half squares =3 square units Total area =18+3=21 square units. Have students do guided practice. **Conceptual Understanding - Reading time** (***outcomes 10 &11)***

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 Retrieved from https://images.google.com/ **Checklist** Learner is able to solve at least ¾ problems on the worksheet **(yes/ no)** Product(Student complete seatwork) Select the correct answer by circling.	Teacher presents an analogue clock to students, telling them that analogue clocks are circular clocks with the numbers 1-12 around the edge. These clocks use two hands to tell the time. The small hand dictates the hour, and the big hand dictates the minute of the hour. The analogue clock sometimes has a third hand to count seconds. We tell the time based on where the hands on the clock are pointing. have students view a video:Telling Time For Children - Learning the Clock Teachers are encouraged to use a real clock in helping students understand time on an analogue clock. Have students view video: ' Telling and Writing Time' on a digital clock video: https://youtu.be/QTvVLblhsBY?si=VE87nlV_YPbg5vRD Teacher guides students into understanding concept by providing adequate practice. Teacher guides students into solving time using addition and subtraction.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	1. Which of these notes is the $5 that we use in the OECS?  2. Which of these coins is not used in the OECS?  3. Write the names of these notes and coins.  Write the following amounts in words. (a) $0.75 (b) $2.86 (c) $41.02 (d) $50.60 Write the following amounts in figures. (a) four dollars and ten cents (b) thirty cents (c) seventy dollars and one cent (d) ninety-two dollars and fifty-seven cents Solve:	Have students change minutes to second and seconds to minutes mentally and on paper. Let them create their problems. Example: • ½ minutes = 30 sec • 1½ minutes = 90 sec • 1 minutes = 60 sec • 2 minutes = 120 sec • 2½ minutes = 150sec • 1 min 20 sec = 80 sec • 4 min 5 sec Let students find the sum of times. 5 minutes + 20 sec = <u>2 minutes + 10 sec =</u> <u>Students will add or subtract times</u> Teacher will get a quick read on ideas and explanations from the students. It is a quick and engaging way to get a class snapshot of students' thinking. Commit and Toss ● Students are given an assessment probe. (What colour is the EC$5?) ● After completing the probe, students crumple their papers into a ball and, upon a signal from the teacher, toss the paper balls around the room until

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Nicole has 2 ten dollar bills and 3 five dollar bills. Does she have enough to buy a pair of shoes that cost $50? Three apples cost $6.40. Mom pays for the apples with a $5 and two $1 bills. How much change will Mom receive? One orange costs $2.00. How much would 3 oranges cost? Playpaper money can be used to help assist students with solving problems. Simulation: Shopping Game E.g., Andy and his sister bought 2 sodas for $6.00, 3 bags of popcorn for $3.00 and 4 chewing gums for $5.00. (a) What is the total amount spent? (b) What is their change from $20.00?	the teacher instructs them to stop and pick up or hold on to one paper. ● Students share the answer on the paper they are holding without presenting their own ideas. ● Confidence increases when students realize that she or he is not the only one with a different answer. ● Helps students see that 'wrong' answers can be just as valuable for informing learning as 'right' answers. (answer is green) MATCHING CARDS Students find pairs of cards that share the same relationship or attribute (e.g, $1.00 and 4 quarters). Partner Speaks Provide students with an opportunity to talk through a concept or problem solution with another student and receive feedback before sharing with a larger group. When ideas are shared with the larger group, pairs speak from the perspective of their partner's ideas.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		Eg. What is the total when 3 tens cents, 5 quarters and 2 five cents are added? Pass the Problem ● Students begin by working together in pairs to respond to a problem, partially completing a solution to the problem. ● When the time is up, students exchange their partially completed solution with another pair to finish – modifying, adding to, or changing it as the pair deems necessary. Eg. Rosemary has 3 five dollar bills and 1 ten dollar bill whereas Alix has 4 five dollar bills. Which of them has more money? Explain your answer. Partner Speaks ● Provide students with an opportunity to talk through a concept or problem solution with another student and receive feedback before sharing with a larger group. ● When ideas are shared with the larger group, pairs speak from the perspective of their partner's ideas.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		 **Discovery - Shopping *(outcome 13,14,15)*** Have students bring in items from home to make their own classroom shop. Guide students into pricing items. Allow students to take turns buying and selling. Give students selected items, let them tell the total price and the change they would receive if they were to pay with a selected bill. E.g: Tom buys 1 can milk and 1 box of matches , how much will he be required to pay? If Tom pays with $5.00, how much change will he receive?

Additional Resources and Materials:

Links to online games and resources.
https://sciencing.com/measure-millimeters-centimeters-meters-8146016.html
https://www.iknowit.com/lessons/b-estimating-lengths-centimeters.html
https://www.k5learning.com/free-math-worksheets/third-grade-3/measurement/units-of-length-metric
https://www.twinkl.com/teaching-wiki/measurement

(teachers will use discretion in viewing part or full length videos based on need)

Additional Useful Content Knowledge for the Teacher: (Perimeter is the total length or distance around an object or region. A perimeter measurement is a length measurement.

- If a perimeter is made up of straight lines, the parts are measured with a ruler and the measurements are combined. This is an application of the additivity property.
- Curved perimeters are difficult to measure accurately with a ruler. A "go-between," like a string, is used to match the perimeter of the object and then measured. The measurement of the go-between is used as the measurement of the perimeter. This is an application of the transitivity property.
- Different shapes can have the same perimeter. A shape with a perimeter of 20 centimetres could be a 5 centimetres × 5 centimetres square, a skinny rectangle that is 2 centimetres × 8 centimetres, any other polygon, a combination of curves and straight lines, or a completely curved shape. To construct a shape with a given perimeter, the amount of length must always be tracked so that the remaining length can be distributed appropriately around the rest of the shape.
- Measurements of continuous quantities, like length, are always approximate. The smaller the unit, the greater the potential accuracy. If different-sized units are used to measure an object, each unit is counted and tracked separately.
- Because measurements are approximate, a combination of units might be used for greater accuracy (e.g., a combination of centimetres and millimetres for a length between 5 centimetres and 6 centimetres).
- The appropriate unit of length depends on the reason for measuring an object. Larger units are used for approximate measurements; smaller units are used for precise measurements and detailed work. While non-standard units are appropriate for quick, personal measurements, standard units are used when communicating measurements.

Note

In Grade 3, students do not use decimals in their measurements.

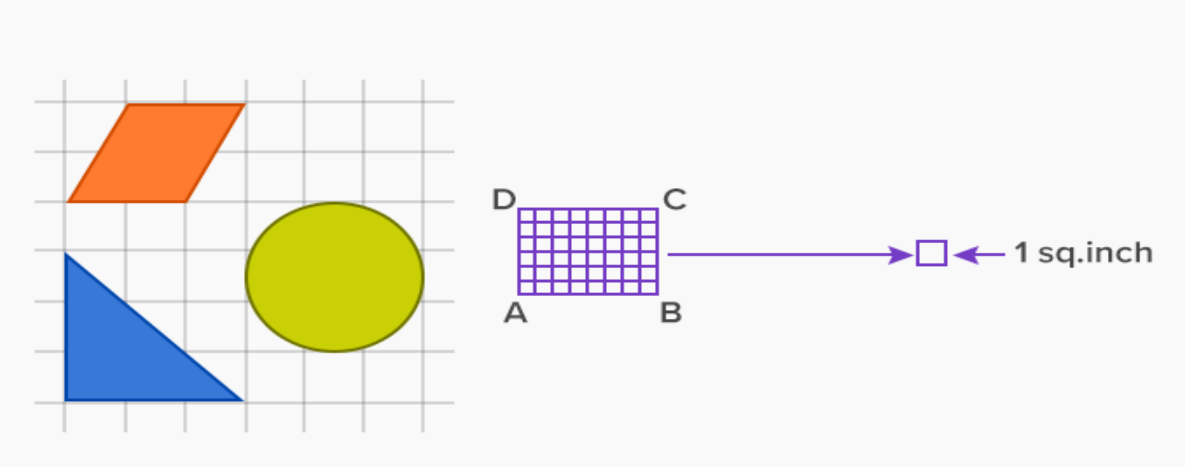
Area

We can calculate the area of a shape using a grid. The area of any shape is the number of square units that can fit into it. The grid is made of many squares and each square has sides 1 unit by 1 unit, i.e., the area of each square is 1 square unit. Each square is known as a unit square.

Take a pencil and draw a square on a piece of paper. It is a 2-D figure. The space the shape takes up on the paper is called its **Area**.

Now, imagine your square is made up of smaller unit squares. The area of a figure is counted as the number of unit squares required to cover the overall surface area of that particular 2-D shape. Square cms, square feet, square inches, square meters, etc., are some of the common units of area measurement.

The easiest method to interpret the area of geometric shapes is using "unit squares." **A unit square is a square with each of its side lengths measuring 1 unit.** Using this as a basis, the area of a polygon is the number of unit squares within a shape.



Time

- Clocks can answer two questions: "What time is it?" and "How much time has passed?." The focus in Grade 3 is on the first question.
- A colon (:) is used to separate units of time. Generally, time is read in hours and minutes, so 12:36 means 36 minutes after 12:00. To describe time more precisely, another colon is used to show seconds, so 12:36:15 means it is 15 seconds after 12:36.
- Analog clocks use fractions of a circle to provide benchmark times: quarter past the hour; half past the hour; and quarter to the hour. Benchmark times are not evident in digital clocks.
- Analog clocks have a face with three different scales. Analogue clocks use two hands to tell the time. The small hand dictates the hour, and the big hand dictates the minute of the hour. The analogue clock sometimes have third hand to count seconds. Navigating these scales can make reading an analog clock challenging.
- The shorter hour hand (0 to 12, numbered scale) measures broad approximate time.

- The longer minute hand (0 to 60, unnumbered markings) measures time more precisely.
- The optional second hand (same 0 to 60 scale as that used by the minute hand) is used for precise time.
- The 24-hour clock is widely used in transportation schedules and in the military. For many parts of the world, it is the standard way of describing time.

Note: Digital clocks are easier to read but may be more challenging to understand. To know that 9:58 is almost 10:00 requires an understanding that there are 60 minutes in an hour. This is unlike the place-value system, which moves in groups of 10 and 100. Using both digital and analog clocks helps make the 0 to 60 scale visible.

Reference:https://www.dcp.edu.gov.on.ca/en/curriculum/elementary-mathematics/grades/g3-math/strand-e/e2

Opportunities for Subject Integration:

Mathematics:
-estimation in rounding off numbers
-counting using multiples of five
-simplifying fractions involving hours and minutes
-finding a fraction of an amount eg half hour equals 30 minutes
-analysing statistical data involving unit and total prices prices
-identifying patterns and angles on the analogue clock
-using money totals to collect data

Strategies that Support the Curriculum and Assessment Framework

Elements that are integrated across subjects:

Language Arts: *Allow students to use words associated with measurement in vocabulary lessons, e.g length, perimeter, surface, cover.*
Allow students to read stories involving partitioning or sharing, involving time

Science *: Allow students to estimate and measure length of plants*

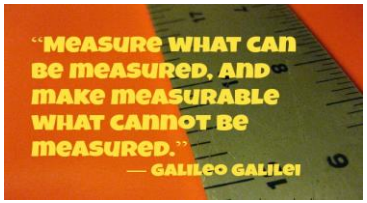
Social Science: *Finding change using different types of currency used in the region*

Elements from Local Culture, Technology, TVET, Environment that are integrated:

- *Have students estimate and measure objects in their immediate environment*
- *Students can make their own centimeter and meter rulers using material from the environment such as sticks.*
- *Have students use local material to measure, such as strings.*

- *Help them identify areas in their environment that are measurable using both standard and non-standard units of measurement.*
- *Have students build their own clocks from material from their immediate environment such as cardboard and disposable plates*

Items of Inspiration (teaching tips, inspirational passages, connections to educational research):



Retrieved from https://www.homeschoolingsc.org/wp-content/uploads/2015/03/math-measure.jpg

Data Handling & Probability ELO1.1

Introduction to the Subject:

Data Handling is a prominent concept that ensures the veracity of the research data. In this unit, students are therefore guided in the steps taken to collect, interpret and represent data correctly. They will also develop the skills needed to infer and make probabilities of events from data received.

Strand (Topic): *Data Handling and Probability*

Essential Learning Outcomes: Collecting, Organising and Displaying Data - Formulating questions that can be answered with data

Grade Level Expectations and/or Focus Questions: Brainstorm and identify topics of personal interest for investigation and develop questions for surveys to generate data

Focus Questions.

How can data be used after it is collected?

Why is it important to collect data?

How can the collection of data be significant over time?

How can collecting data help us to make informed decisions?

Why is it important to use the best method to collect data?

How can data collected change over time?

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
<u>Knowledge</u> 1. Identify the different methods used to collect data. **<u>Skills</u>** 2. Create questions that may be answered through data collection. 3. Collect and record simple data in and around the school using different methods (observation, questionnaire, interview). **<u>Values</u>** **4.** Choose//volunteer to collect information using types of data collection methods to answer questions.	***Conversation*** *Create scenarios which require students to compare and contrast different data collection strategies.* *Example: The principal wants to introduce a new sport to the school, and the students are asked to investigate what sport students like the best. Students would be required to create an interview schedule.* ***Journal Writing*** *Students create a journal recording their activities collecting data using different data collection methods.* ***Think Pair Share*** *<u>Data Presentations</u>* *Have students work in pairs to collect and analyze data on a specific topic. Each pair will then create a presentation to share their findings with the class. After each presentation, allow time for other students to ask questions and provide feedback on the data collection methods, analysis techniques, and overall presentation.* ***Peer Assessment***	(example) ***Inquiry-based Learning*** Provide students with scenarios to generate students' interest to formulate questions and collect data. - Teach students the importance of planning their data collection process. Help them identify the purpose of their data collection and the specific variables they need to measure. - Guide students in designing appropriate data collection methods such as surveys, observations, experiments, or interviews. - Encourage students to create a data collection plan with clear steps, timelines, and resources needed. - Teach students how to record data accurately. Emphasize the importance of using consistent units of measurement and clear labels.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Students work in pairs to collect the information for the new sport to add to the curriculum. *Students choose the most appropriate method to collect data. Students present their findings to the rest of the class. Their peers assess the work done and their presentation.* <u>Data Critique Panels</u> Divide the class into small groups and assign each group a specific data set to analyze. Have each group prepare a short presentation critiquing the data collection methods, data quality, and analysis techniques used. Then, bring the groups together for a panel discussion where they can present their critiques and engage in a constructive dialogue about the strengths and weaknesses of each data set. ***Observation*** ***KWL*** 1. *Know: Begin by asking students what they already know about data collection. Write down their responses on a chart or whiteboard. This will help you gauge their prior knowledge and activate their background understanding of the topic. Some possible responses might include: "Data collection involves gathering information," "Data can be collected through*	- Provide students with templates or tools to organize and record their data effectively, such as data tables, charts, or digital spreadsheets. - Remind students to record data in real time to minimize errors or memory biases ***Authentic Learning (group work)*** Engage students in a yard/ jumbo sale activity in which they record the buying and selling of items to generate questions:  Source: https://www.paramountcity.com/services/yard-sales *Example:* *What was the favoured item?* *Which gender bought the most items?* *How many of a given item was bought on the day?*

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	surveys or experiments," or "Data collection helps us make informed decisions." 2. *Want to know: Ask students what they want to learn or understand better about data collection. Encourage them to think about specific questions or areas they would like to explore. Write down their questions on the chart or whiteboard. This will help guide your instruction and ensure that you address their curiosity. Some possible questions might include: "How do we choose the best method for data collection?" "What are some common challenges in collecting data?" or "How can we ensure that our data is accurate and reliable?"* 3. *Learned: After students have had the opportunity to explore and engage with the topic of data collection, revisit the KWL chart. Ask students to share what they have learned about data collection. Write down their new understandings and insights on the chart or whiteboard. This will allow students to reflect on their learning and consolidate their knowledge. Encourage students to reference their initial questions and see if they have been answered or if they need further exploration.* ***Checklist*** *Students' questions are evaluated using a rubric, analyzing if the questions are suitable for the topic and relevant for collecting data.*	**Group** Work Guide students as they work in groups to formulate questions that they will use to collect data about selected topics. Example: Topic - The number of students in Grade 3 who belong to the different sports houses at school Possible questions: 1. How many sports houses are there at school? 2. How many students belong to each house?

Additional Resources and Materials

Wordwall Game: Ways we represent data: https://wordwall.net/resource/32294527

YouTube video on how to collect and record data using a tally: Data! | Mini Math Movies | Scratch Garden - YouTube

Additional Useful Content Knowledge for the Teacher:

Opportunities for Subject Integration:

Language Arts- Asking/ writing and answering research questions, reading stories, Spelling words used, e.g. pictographs, information, etc.

Social Studies - List the natural resources in the nation and observe how many are found in their school environment.

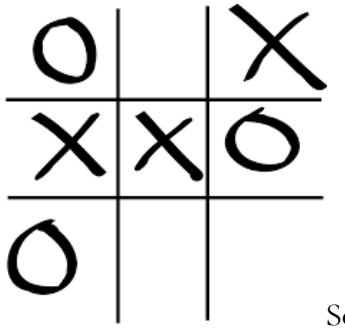
Science -writing hypothesis

HFLE -

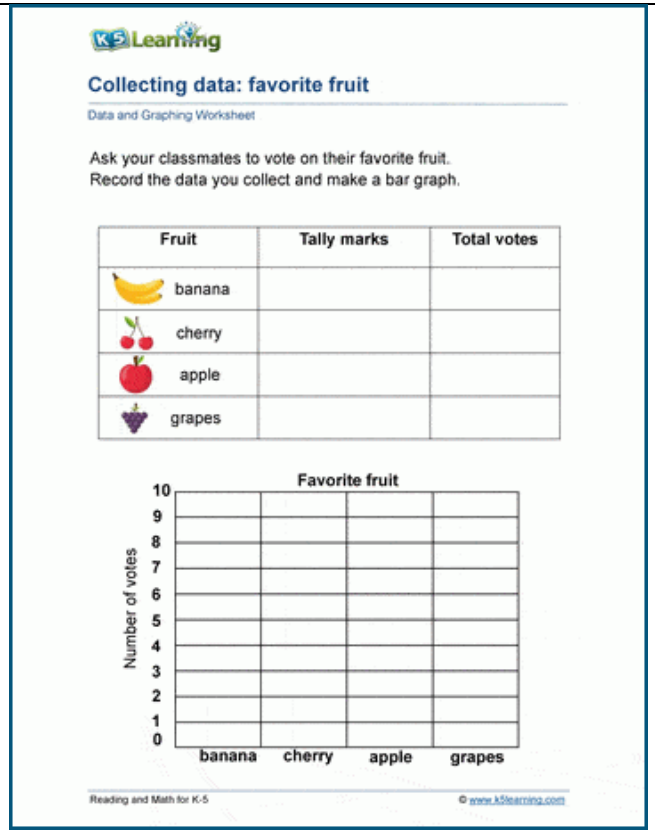
Art/Craft - Students create posters and or flyers for their yard sale.

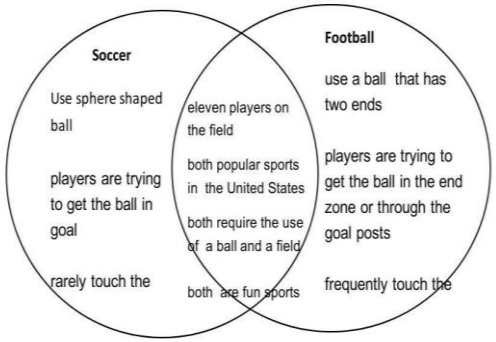
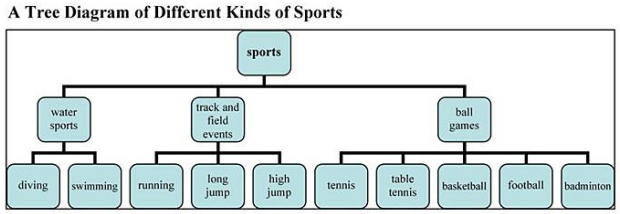
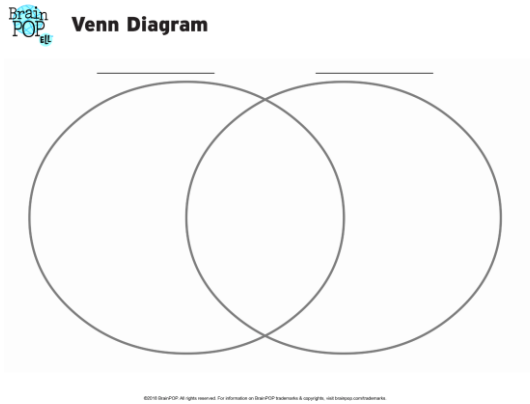
Data Handling and Probability ELO 1.2

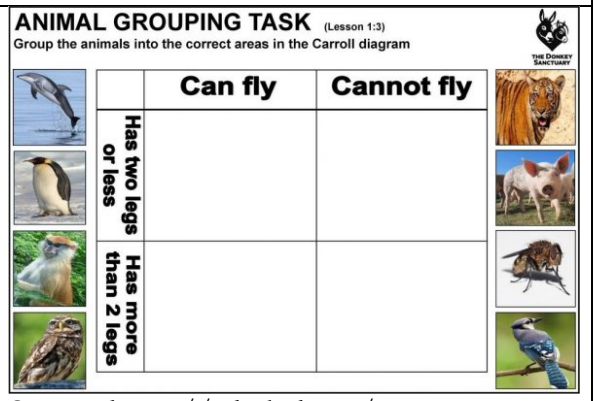
Introduction to the Subject:
Strand (Topic): *Data Handling and Probability*
Essential Learning Outcomes: *Collecting, Organising and Displaying Data - Collecting, organizing, displaying and communicating data.*
Grade Level Expectations and/or Focus Questions: *Sort sets of data about people or things according to two and three attributes, using tables and logic diagrams, including Venn, Carroll, and tree diagrams, as appropriate. Collect data through observations, experiments, and interviews to answer questions of interest that focus on qualitative and quantitative data and organize the data using frequency tables. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.* **Focus Questions:** 1. ***How can the data that was collected be best displayed?*** 2. ***Why is it important to organize, display and communicate the data collected?***

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
<u>Knowledge</u> 1. *Select/choose the most appropriate method/way (chart, table, graph) to display data collected* **<u>Skills</u>** 2. *Draw/construct/design scaled picture graphs (pictograph) and bar graphs to represent collected data* 3. *Communicate/interpret displayed data through questions and answers.* 4. Sort sets of data about people or things according to two and three attributes, using tables and logic diagrams, including Venn, Carroll, and tree diagrams, as appropriate. **<u>Values</u>** 5. *Participate in data collection activities showing enthusiasm during tasks.*	***Group Work*** ***'Bucket dash Game'*** *- Students work in teams to compete, by throwing coloured balls into a bucket. Each group has a special colour. Each group records the number of balls they got in the bucket. The entire class will record the information. Each group would display the information collected in a graph.*  *Source: https://2716595.fs1.hubspotusercontent-na1.net/hub/2716595/hubfs/undefined-Sep-23-2022-09-56-39-21-AM.jpeg?width=600&height=400&name=undefined-Sep-23-2022-09-56-39-21-AM.jpeg*	<u>Observation</u> **Think Pair Share** Learners play 3 rounds of a game called tic-tac-toe. Teacher asks students a series of questions (Did you enjoy the game? Who won each round? How many X's and O's were used?) Students record how many X's and O's were used in the game. They create a graph to show the results.  Source: https://cdn.pixabay.com/photo/2013/07/12/15/56/tic-tac-toe-150614_1280.png **Whole Class Activity** <u>Data Comparison Activity</u>

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Bar Graph Guru Students create a bar graph to represent data of their interest collected in a survey.  Source: https://www.cambridge.org/elt/blog/wp-content/uploads/2018/07/students-presenting-e1532074767453.jpg ***Product (Worksheet)*** *Students represent data on information gathered about favourite fruit.*	Provide students with multiple data sets related to a common topic. Ask them to compare and contrast the data using different types of graphs or charts. This activity helps students understand how different representations can highlight different aspects of the data and support meaningful comparisons. **Individual work** Each learner gets a pack of Skittles or M&Ms and records the flavours or colours they got in the pack.  Source: https://cdn.filestackcontent.com/dzeMSZ3CSyG9In3lFHOq

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 *Source: https://www.k5learning.com/worksheets/math/data-graphing/grade-1-collecting-data-a.gif* **Favourite Sports**	Learners will complete worksheets on data collection to practice data representation skills. Present a list of raw scores previously collected and allows students to organize in a method they are comfortable with. **Interview and Compare** Students interview two classmates and collect information to compare their hobbies using a Venn diagram.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Choose two popular sports and create a Venn diagram to show similarities and differences in their rules and equipment.  Source: https://ph-static.z-dn.net/files/d88/4b5837fcdf0668f6d81562d310a71e34.jpg **Tree Diagram Presentation** Students create a presentation explaining how tree diagrams can be used for data collection.  Source:	 Source: https://educators.brainpop.com/wp-content/uploads/2014/03/venn_diagram.png **Sort Animals Using a Carroll Diagram** Use a Carroll Diagram to sort a variety of animals based on their characteristics.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	https://cd1.edb.hkedcity.net/cd/eng/vocab09/images/ch2mod1_pro_t1a_1.jpg **Tree Diagram Reflection** Students write a reflection on how tree diagrams help in organizing and analyzing data.	 Source: https://teleskola.mt/wp-content/uploads/elementor/thumbs/animal-carroll-diagram-ec1e645e8e855156255cf091d8e9bc8a-op3aeygja7r43lrdcjc996i5klh52yaaps5y377g1s.jpg

Additional Resources and Materials

3rd Grade - Math - Interpret Data - Topic Overview Part 1 of 2

What is a Venn Diagram?

2020/21- Maths - Week 8 - Lesson 2 - Animal Carroll Diagram

Online game (Creating a graph) - IXL | Create pictographs | 3rd grade math

Additional Useful Content Knowledge for the Teacher:

Opportunities for Subject Integration:

Language Arts- Write an expository writing stating how they would collect data for their topic.

Social Studies - collecting information about the population (census)

Science - collect and record data about the weather, germination and growth of plants

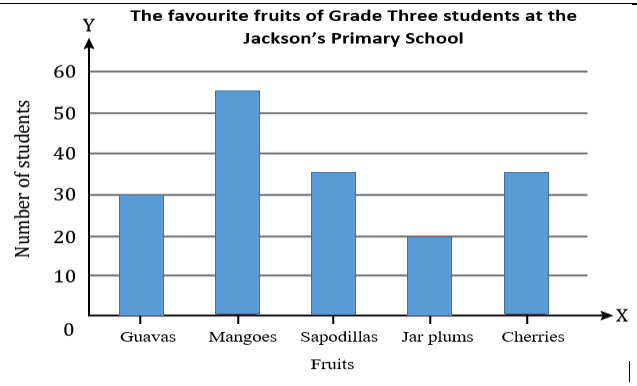
HFLE - collect and record data about the type of family their peers belong to

Art/Craft - create and display 3D graph models, probability spinners, Draw pies divided into various sectors. Colour sectors.

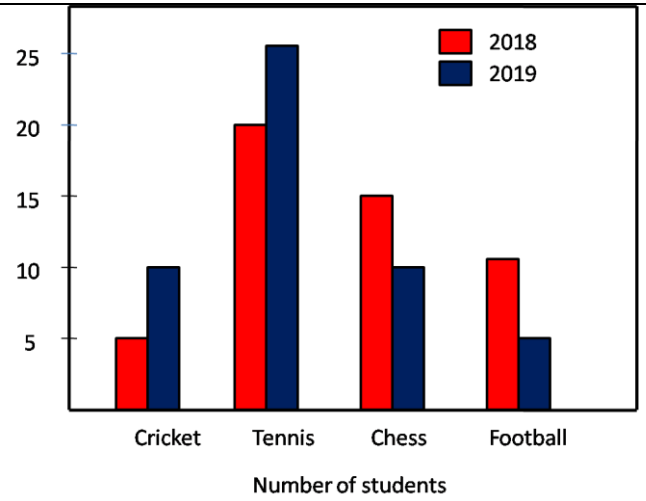
Data handling and probability ELO 2.1

Introduction to the Subject:
Strand (Topic): *Data Handling and Probability*
Essential Learning Outcomes: *Using Statistical Methods to Analyse Data - Describing sets.*
Grade Level Expectations and/or Focus Questions: *Can obtain information from a graph (scaled bar graph); Can read and describe data sets displayed on bar graphs*. **Focus Questions:** 1. **How can we gather information from a bar graph?** 2. **Why do we use a bar graph to display a data set?** 3. **Why do we use a bar graph to display data?** 4. **How do we select the most appropriate method to analyse a data set?**

Specific Curriculum Outcomes	**Inclusive Assessment Strategies:**	**Inclusive Learning Strategies:**
Students will be able to: **<u>Knowledge</u>** 1. Describe a given data set (of numbers, shapes or objects)	***Product (Worksheet)*** *Students answer questions based on data presented in a bar graph.*	**Video Presentation** *Present a YouTube video clip to students on the topic of data interpretation. During intervals, have a discussion with students to help them understand how*

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
2. Read and interpret data presented in bar graphs 3. Answer questions about data presented in bar graphs **Skills** 1. Label the title, horizontal axis and vertical axis of a bar graph (Give appropriate titles to bar graphs 2. Create questions related to data presented in bar graphs **Attitudes** 1. Willingly participate in group activities 2. Collaborate with classmates to complete assigned tasks. 3. Ask questions to gain clarification about concepts they may not understand.	 *Sample questions:* 1. *Which fruit is most liked?* 2. *How many students prefer guavas than jar plums?* 3. *Which fruits are preferred by the same number of students?* ***Observation (Gallery walk)*** *Place students in groups and present each with different bar graphs. Each group will use the data to answer related questions about the data presented. Upon completion of the task, students will post their individual group's work on the walls of the classroom. Students then take turns to walk around the room to peruse the groups' responses to the questions.*	*to answer questions relating to the data set presented in the bar graph.* *YouTube video:* *https://www.youtube.com/watch?v=iCnh6EL1Lmo* *Duration: 3 :16 mins* ***Group work*** *Place students in small groups and present them with a bar graph with data they would have collected in a previous lesson. Students will use such to practise interpreting and analysing data.* *Example: Use the bar graph that shows the different number of M&Ms in a pack to answer the questions.* *Possible questions:* 1. *Which colour is most popular?* 2. *Which colour is the least popular?* 3. *How many yellow M&Ms are there?* 4. *How many M&Ms are in the pack?*

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 *Source: https://www.decaturclassical.org/apps/pages/index.jsp?uREC_ID=1148429&type=u&pREC_ID=activity&postid=1657015* ***Conversation (Think-pair-share)*** *Present various images of bar graphs to students; have them work collaboratively to identify suitable titles based on the data sets presented.* ***Data Comparison*** *Students compare two sets of data by creating a double bar graph and answering questions about the differences and similarities.*	

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 *Source: https://s3-us-west-2.amazonaws.com/infinitestudent-images/ckeditor_assets/pictures/420560/original_wrong_2.png*	

Additional Resources and Materials

Mr. Pearson Teaches Third Grade - All About Bar Graphs

Additional Useful Content Knowledge for the Teacher:

A bar graph or chart is used to organized data using rectangular bars of different heights or lengths. The height/length of each bar is proportional to the value or number it represents. Bar graphs can be drawn vertically or horizontally.

Bar graphs are often used to compare data of different categories. They also make it easier to see patterns and trends in data. If the value of a category is increasing, or decreasing, this is called a trend. A pattern is something that seems to keep happening. Presenting the data so you can interpret these patterns and trends is one of the benefits of using bar charts.

Opportunities for Subject Integration:

Language Arts- Write a paragraph to describe the data collected., report finding.

Social Studies - Collect and organize data to answer the question, which place in St. Vincent and the Grenadines the pupils in grade 5 are living.

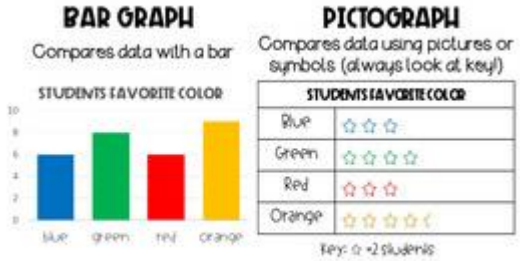
Science - predicting the weather,

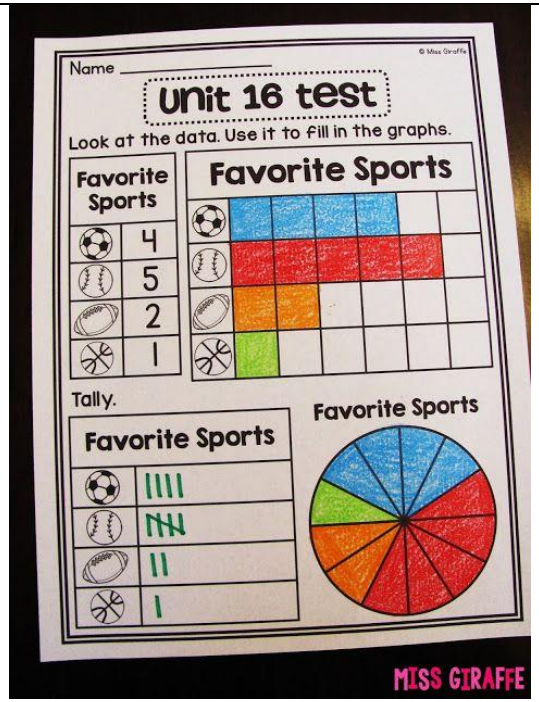
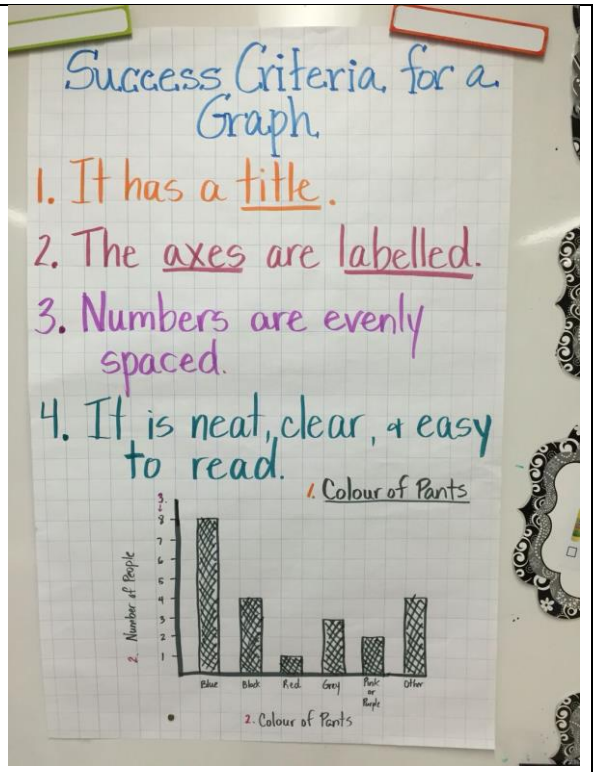
HFLE - make decision regarding diet and health,

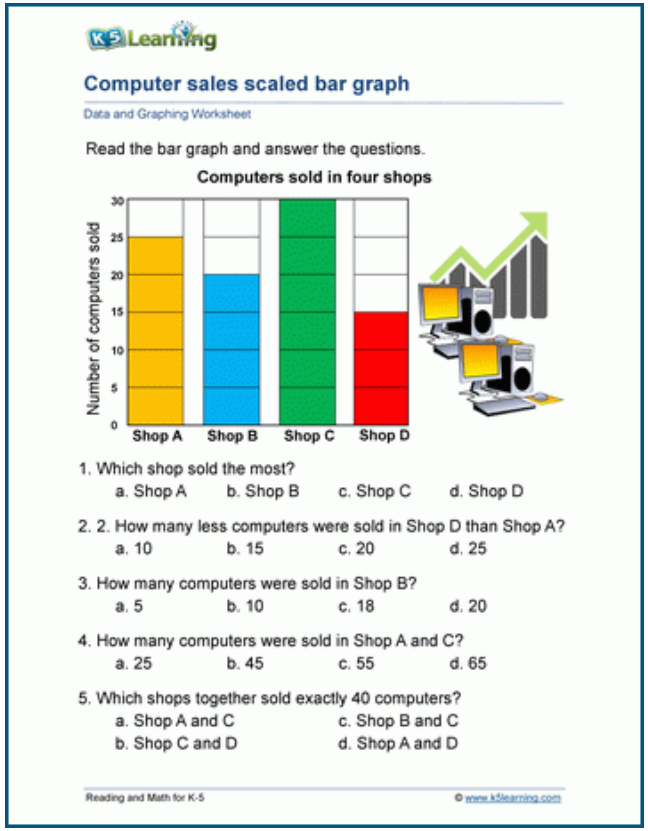
Art/Craft -

Data handling and Probability 2.2

Introduction to the Subject:
Strand (Topic): *Data Handling and Probability*
Essential Learning Outcomes: *Using Statistical Methods to Analyse Data - Developing and applying methods to analyse data sets.*
Grade Level Expectations and/or Focus Questions: *Explain why many-to-one correspondence is sometimes used rather than one-to-one correspondence. Can read between that data to make comparisons and describe relationships. Analyse different sets of data presented in various ways, including in frequency tables and in graphs with different scales, by asking and answering questions about the data and drawing conclusions, then make convincing arguments and informed decisions.* Focus Questions: 1. Why do we sometimes use many-to-one instead of one-to-one correspondence in data analysis? 2. How can we make convincing arguments and informed decisions based on data analysis? 3. How do we determine the best way to organize data? 4. How can data analysis assist a small business operator (tuck shop vendor, shopkeeper)?

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Students will be able to **<u>Knowledge</u>** 1. Ask and answer simple questions by counting the number of objects in a category and sorting the categories by quantity. 2. Compare two sets of data to draw conclusion. 3. Choose the best method to organize data. **<u>Skills</u>** 4. Interpret and present data using graphs, tally charts and simple tables. 5. Solve one-step and two-step questions. For example: "How many more or how many fewer?" Using information presented in a scaled graph. 6. Create graph to represent data. **<u>Values</u>** 7. Organize a set of data as one-to -one and many-to-one correspondence. 8. Use mathematical language correctly when explaining the graphs.	***Product (Individual Assessment)*** presents students with information in one form for example a bar graph and ask them to use the information in the graph to construct a table with the same information.  Source: https://ecdn.teacherspayteachers.com/thumbitem/Types-of-Graphs-Anchor-Chart-Tally-Chart-Bar-Graph-Pictograph-Line-Plot-5080020-1657580191/original-5080020-2.jpg **Conversation (Group Work)** Have students work in groups to investigate something of interest to them. Let them present the information collected in an oral presentation using graphs to explain what was collected and state their interpretation of what was gathered.	**Observation** Have students describe, orally or in writing, what the graph is showing (interpret the data). Use guiding questions if needed. (What is the graph showing? How do you know this? Which is the most? Which is the least?) Students complete worksheets answering questions correctly based on the information presented on the graph and table focussing on the many to one correspondence.  **Product** Create a criterion with the students, then have them create a concrete graph to display the information.

	 Source: https://i.pinimg.com/736x/7f/38/66/7f3866b0b74ffb59b797410e39e5cf54--first-grade-math-grade-.jpg **Conversation (Oral Presentation)** Present two sets of data with income generated from two vendors on a weekly basis for pupils to make graphs and draw conclusions on the data that is more profitable to the seller and which seller is most likely to generate the most profit from sales over a specific period of time.	 Source: https://i.pinimg.com/originals/43/1f/1e/431f1ee14be379ee0409070de664d1dc.jpg Practical: pupils are given paper and pencils to use at break to collect data. They will then organize them using the best method. They will then make suggestions as to which snacks vendors should purchase most in order to maximise and why.

	Pupils present their conclusion to the class and give reasons for making such conclusions. **Product (worksheet)** Students complete worksheets requiring them to interpret data presented in graphs.  Source: https://www.k5learning.com/worksheets/math/data-graphing/grade-3-analyzing-scaled-bar-graphs-a.gif	

Additional Resources and Materials

Data Collection Game: Bar Graph Egg Sorting Game | Game | Education.com

Answering Questions from a Bar graph - IXL | Use bar graphs to solve problems | 3rd grade math

Additional Useful Content Knowledge for the Teacher:

Data is organized to help one analyse and make decisions. Different sets of data can be organized differently for example, frequency table

Opportunities for Subject Integration:

Language Arts- Write an argumentative essay on a set of data to make an informed decision.

Social Studies - Compare the populations of two countries with their land spaces to determine which population is denser.

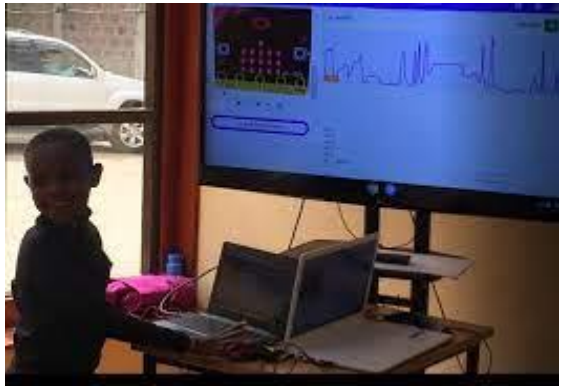
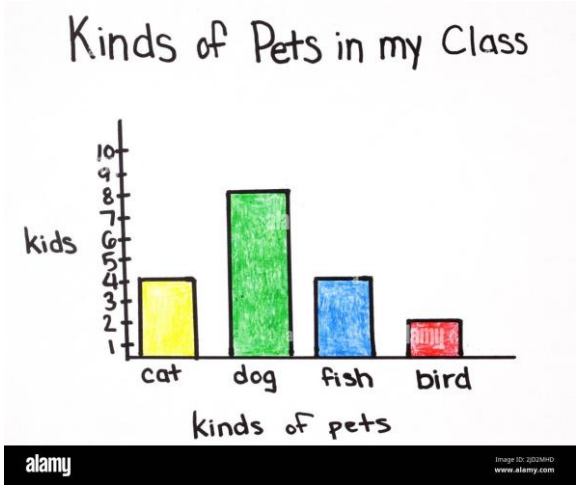
Science - Construct a bar graph/table on the daily temperature for the week at a particular time of the day every day.

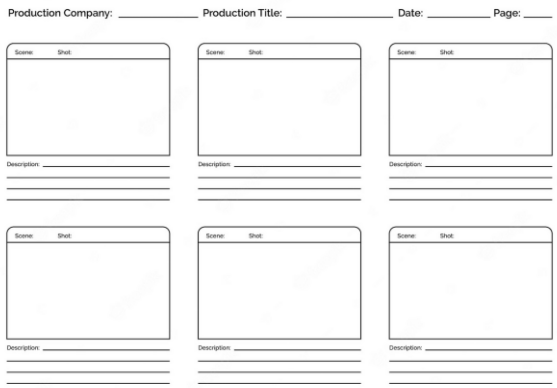
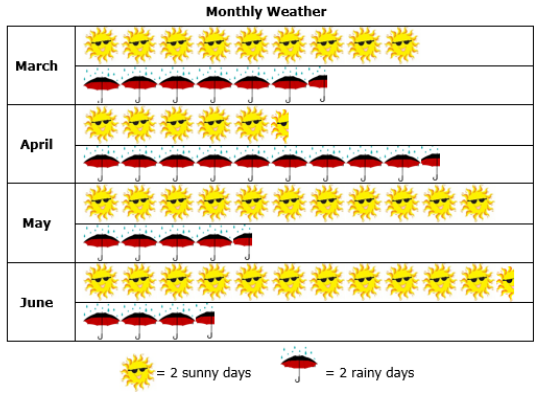
HFLE -

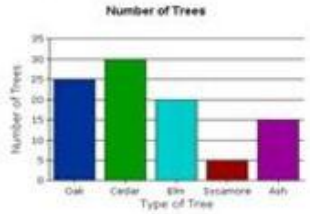
Art/Craft - From data collected make different graphs to be displayed around the class.

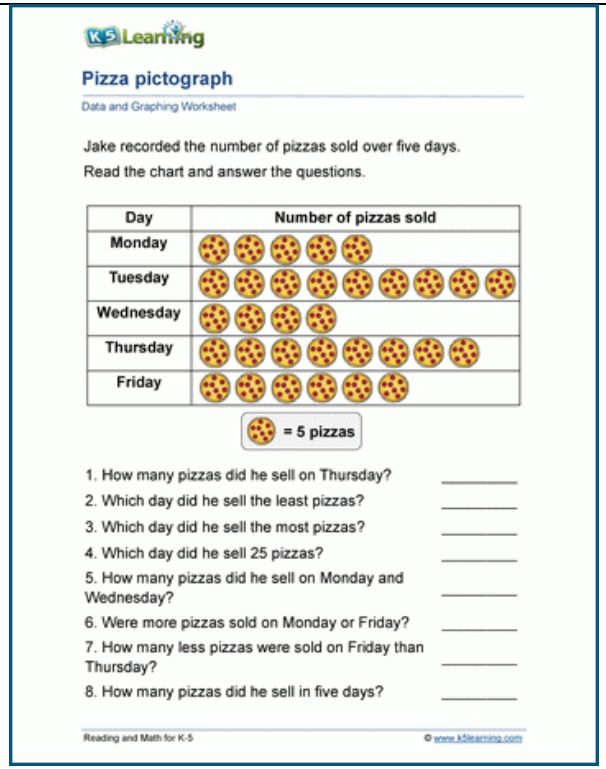
Data Handling and Probability 3.1

Introduction to the Subject:
Strand (Topic): *Data Handling and Probability*
Essential Learning Outcomes: *Evaluating Inferences and Making Predictions Based on Data - Making inferences with data sets.*
Grade Level Expectations and/or Focus Questions: *Can read beyond the data by making inferences and predictions based on the data.* **Focus Questions:** **How can data help us to predict what can happen in the future?** **How would a business owner use the data collected from sales to determine which products to keep and those to get rid?** **What information can you use or look for to help with making a prediction?**

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Students will be able to: **<u>Knowledge</u>** 1. Demonstrate their ability to read and interpret data by answering data collection questions correctly. **<u>Skills</u>** 2. Analyse graphs to answer questions correctly. 3. Make simple predictions based on the graphs given. **<u>Values</u>** 4. Recognize the need to interpret graphs to get information. 5. Demonstrates autonomy in independently working with graphs.	***Oral Presentations*** *Learners would be presented with the opportunities to analyse a graph and present the information to the class.*  *Source: http://tinkeredu.net/wp-content/uploads/2020/03/Feature-Photo-e1583936082832.png* ***Story Telling Time*** *Students write a short story incorporating inferences drawn from a given data set.* ***Storyboard Creator***	*Observation & Oral Questioning* *Students would be presented with a graph and are asked questions orally by the teacher to test their understanding of what is shown.*  Source: https://c8.alamy.com/comp/2JD2MHD/a-bar-chart-displaying-the-data-sets-of-four-different-kinds-of-pets-that-students-have-at-home-cats-dogs-fish-birds-2JD2MHD.jpg Students look at a graph and are asked to answer questions based on the picture.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Create a storyboard illustrating an inference made from given data.  *Source: https://miro.medium.com/v2/resize:fit:1400/1*v9lvN3hIX1AiAAe4u32Q1Q.png* **Data Analyzer** Analyse a graph or chart and draw conclusions based on the data.	Students will also make predictions based on the information shown on the graph. Example:  Source: https://www.math4texas.org/cms/lib6/TX01927955/Centricity/Domain/24/210D.PNG Questions: 1. Which month should the P.E teacher prepare for indoor sports with the students? 2. Parents must protect their children's skin from the sun. Which month would they buy the most amount of sunscreen lotion?

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	4. Joseph counted all of the different trees in the woods near his house. He made a graph showing his results.  What conclusions can Joseph draw from his graph? ***Source: https://ecdn.teacherspayteachers.com/thumbitem/Interpreting-data-given-in-graphs-and-charts-Drawing-conclusions--505563-1686295094/original-505563-1.jpg*** ***Worksheet*** *Students answer questions correctly by interpreting the information on a graph.*	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		

K5 Learning

Pizza pictograph

Data and Graphing Worksheet

Jake recorded the number of pizzas sold over five days.
Read the chart and answer the questions.

Day	Number of pizzas sold
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	

= 5 pizzas

1. How many pizzas did he sell on Thursday? _____
2. Which day did he sell the least pizzas? _____
3. Which day did he sell the most pizzas? _____
4. Which day did he sell 25 pizzas? _____
5. How many pizzas did he sell on Monday and Wednesday? _____
6. Were more pizzas sold on Monday or Friday? _____
7. How many less pizzas were sold on Friday than Thursday? _____
8. How many pizzas did he sell in five days? _____

Reading and Math for K-5 © www.k5learning.com

Source: https://www.k5learning.com/worksheets/math/data-graphing/grade-3-data-graphing-worksheet.gif

Additional Resources and Materials

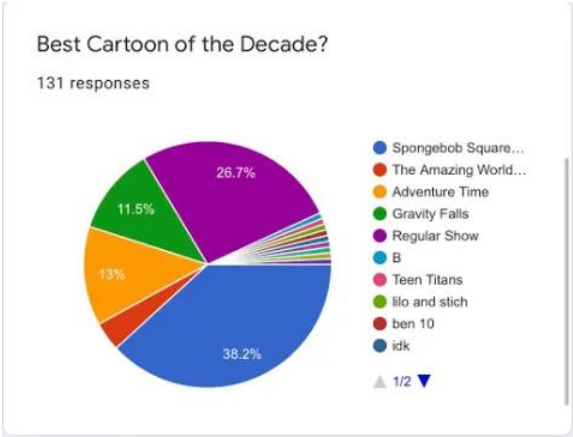
Interpreting picture graphs (notebook) | Math | 3rd grade | Khan Academy

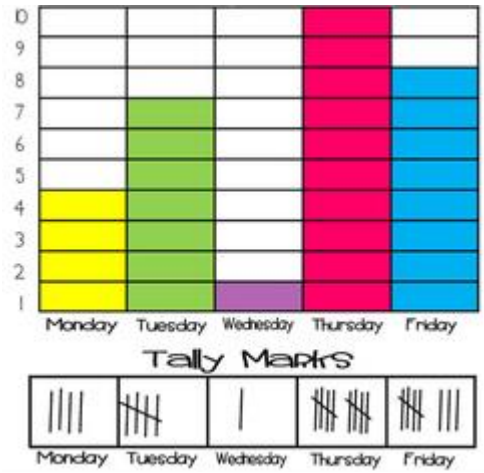
Online game on graph (Interpreting Data) - IXL | Interpret pictographs | 3rd grade math
Additional Useful Content Knowledge for the Teacher:
Opportunities for Subject Integration: *Language Arts- Write a paragraph comparing the weather represented in a graph.* *Social Studies - Look at data and interpret the dominant gender in the school.* *Science - Look at a graph and predict the months they would have to walk with an umbrella.* *HFLE -* *Art/Craft -*

Data Handling and Probability ELO 3.2

Introduction to the Subject:
Strand (Topic): *Data Handling and Probability*
Essential Learning Outcomes: *Evaluating Inferences and Making Predictions Based on Data - Making and testing conjectures based on data sets*
Grade Level Expectations and/or Focus Questions: *Analyse examples of graphs in prints and electronic media (various data sets and graphs); Can make and test hypothesis based on data sets.* **Focus Questions: How can we determine if data presented to us is correct?** **What are some questions that can be asked to determine if the data presented is true?**

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Students will be able to: **<u>Knowledge</u>** 1. Create hypothesis and use a data set to test it. 2. Analyse graphs to test hypotheses based on data collected. 3. **<u>Skills</u>** **4.** Examine graphs to gather information **5.** Develop questions for surveys. **6.** Create hypotheses to be tested based on a data set. **<u>Values</u>** 7. Volunteer to give and test hypotheses. 8. Willingly participate in class discussion on the making and testing of hypotheses.	**Group Work** Mr. Bug is said to be the most favoured teacher in grade 5. Pupils will now test the hypothesis by collecting data from the grade 5 students and make their conclusions based on the data gathered.  Source: https://www.educationquizzes.com/library/America/Elementary-345/Grade-4/Gd-4-SL-Discussion-Rules-main.jpg **Conversation (Oral presentation)**	***Discussion / Conversation*** *Students bring a graph (printed/ electronic) to school to discuss among their peers.* They can make hypotheses, examine the data and test the hypothesis.  Source: https://img.freepik.com/premium-photo/school-kid-class-happy-child-holding-blackboard-blank-education-concept_411285-6569.jpg?w=2000 **Group Activity** Students state their opinion of what is the most favoured cartoon show on television. Students state their belief of which show would be the school's favourite. The students with the same preference work together as a

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Group shared their findings and concluded whether the hypothesis should be accepted or rejected. **Think Pair Share** Students are paired, each student creates a hypothesis and the other gives the method and means of testing the hypothesis. Students work in pairs to test their findings on a topic.  Source: https://iris.peabody.vanderbilt.edu/wp-content/uploads/2013/01/palsK1_05_pairreadingL.jpg	team to go around to the rest of the school to find out the favourite cartoon show on television from the school. The class would report their findings and each group would present the information collected.  Source: https://i0.wp.com/www.benedictnewsonline.org/wp-content/uploads/2020/05/Best-Cartoon-graphic.jpg?resize=475%2C363&ssl=1 **Individual Activities** Students would give their opinion on the day they would read the most books. Students

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		would document the amount of books they read daily for the week to test if their hypothesis is accurate.  Source: https://ecdn.teacherspayteachers.com/thumbitem/Read-Tally-Graph-Days-of-the-Week-pt-2-1657281739/original-243823-2.jpg

Additional Resources and Materials

Teaching students about graphs: ASL Graphs for Kids - YouTube (6.35 minutes)

Additional Useful Content Knowledge for the Teacher:

A hypothesis is a belief made based on limited evidence as a starting point for further investigation. Therefore, hypotheses must be tested and proven before they can be accepted. An example of a hypothesis is smoking is the leading cause of lung cancer.

Help students understand why making hypotheses is important in data analysis. Explain that hypotheses help guide their investigation and provide a framework for testing and analyzing data. Help students understand the importance of background knowledge in forming hypotheses. Encourage them to draw on their prior knowledge, research, or observations to make informed guesses about the relationship between variables. Teach students about the process of analyzing data to evaluate their hypotheses. Help them understand how to interpret the data, look for patterns or trends, and draw conclusions based on the evidence.

Opportunities for Subject Integration:

Language Arts- Define the term 'hypothesis' and give examples of hypotheses.

Social Studies - Test the hypothesis of the ratio of boys to girls that enter Kindergarten

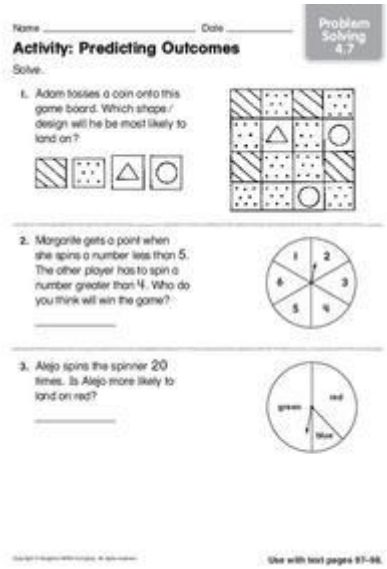
Science - Test the hypothesis: air affects the rate of falling objects

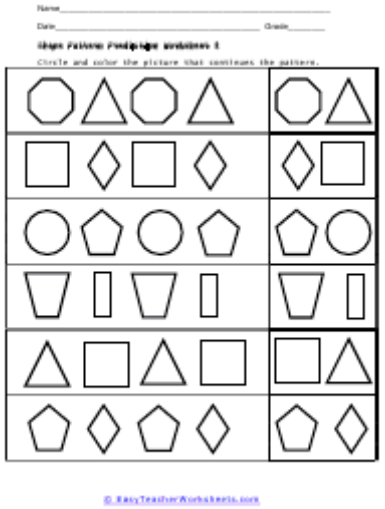
HFLE -

Art/Craft -

Data Handling and Probability ELO 3.3

Introduction to the Subject:
Strand (Topic): *Data Handling and Probability*
Essential Learning Outcomes: *Evaluating Inferences and Making Predictions Based on Data - Evaluating data descriptions and reports*
Grade Level Expectations and/or Focus Questions: *Analyze data to draw conclusions, make decisions, or stimulate other questions about the data sets.* **Focus Questions: How can we use data to make decisions?** **Why do we need to use data to make decisions?**

Specific Curriculum Outcomes	**Inclusive Assessment Strategies:**	**Inclusive Learning Strategies:**
Students will be able to: Knowledge 1. State the meaning of making inferences. 2. Make predictions and inferences based on trends in data. 3. Compare and contrast sets of data to draw conclusions. Skills 1. Read and interpret data to make inferences. 2. Use evidence to support inferences based on data given to them. Values *1.* Combine text with prior knowledge to make inferences. 2. Articulate how their mental concept and text clues work together to help them make inferences.	*Product* *Students predict outcomes from math scenarios given.*  Name _____ Date _____ **Activity: Predicting Outcomes** Problem Solving 4.7 Solve. 1. Adam tosses a coin onto this game board. Which shape / design will he be most likely to land on? 2. Margarite gets a point when she spins a number less than 5. The other player has to spin a number greater than 4. Who do you think will win the game? 3. Alejo spins the spinner 20 times. Is Alejo more likely to land on red? green red blue Use with text pages 97–98. *Source: https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.lessonplanet.com%2Fsearch%3Fkeywords%3Dpredicting%2Boutcomes%2Bmath&psig=AOvVaw3_BOmNpui88-nUaROrejBl&ust=1696442220793000&source=images&cd=vfe&opi=89978449&ved=0CBEQjRxqFwoTCJCQifK52oEDFQAAAAAdAAAAABAE*	**Whole Class Activities** <u>Predict the Story</u> Teachers would give students mathematical scenarios to predict the outcome. *For example: Joshua has an ice cream shop. He sells: Chocolate, Strawberry and Vanilla ice cream. He made $10, from the chocolate, $25 from Strawberry and $15 from the vanilla. Joshua goes to the supermarket, which flavour ice cream would he buy most?* <u>Classroom Changes Predictions</u> One student closes his or her eyes while 3 other children make changes to the classrooms, such as closing the blinds or moving a child from one seat to the other. Then the student with their eyes closed has to predict what he or she thinks they would see when they open their eyes. <u>'What am I Predicting?'</u>

		Students would predict the future of one thing and the rest of the class would try to figure it out. *For example: "They will get smaller and thinner and not limited to text and calls." Answer: Cell phones* **Individual Work** Students will complete worksheets on predicting outcomes.  Source: https://www.easyteacherworksheets.com/pages/pdf/math/kindergarten/shapepatternprediction/7.gif

Additional Resources and Materials Inferences | Making Inferences | Award Winning Inferences Teaching Video | What is an inference?		
Additional Useful Content Knowledge for the Teacher: Making predictions is a valuable skill that helps students actively engage with the content and develop critical thinking abilities. Textual Clues: Teach students to look for clues within the text or context that can help them make predictions. These clues can include foreshadowing, character actions, dialogue, or even the title or cover of a book. Prior Knowledge: Encourage students to draw on their prior knowledge and experiences to make predictions. Help them understand that their background knowledge can provide valuable insights and help them make more accurate predictions. Evidence: Emphasise the importance of using evidence to support predictions. Encourage students to find specific details or information from the text that support their predictions, rather than relying solely on guesswork		
Opportunities for Subject Integration: *Language Arts- Make predictions from text read.* *Social Studies - Predict the population of the school based on figures from previous years.* *Science - Predict the months in which rain would fall heavily based on information presented about the weather in a particular country.* *HFLE -* *Art/Craft - Make a collage of items before and after. (E.g.: What the first cell phone looked like vs a current cell phone)*		

Data Handling and Probability ELO 4.1

Introduction to the Subject:
Strand (Topic): *Data Handling and Probability*
Essential Learning Outcomes: *Understanding and Applying Concepts of Probability - Predicting and describing the likelihood of events.*
Grade Level Expectations and/or Focus Questions: *Develop and apply language to describe the likelihood of events (E.g., always, sometimes, never, etc.) Make and test predictions about the likelihood that the mode(s) of a data set from one population will be the same for data collected from a different population.* **Focus Questions:** **1. How can you describe the likelihood of an event occurring?** **2. Why is it important to be able to describe the likelihood of an event?** **3. How can you identify the mode of a data set?** **4. What do you look for to determine if something is possible?**

Specific Curriculum Outcomes	**Inclusive Assessment Strategies:**	**Inclusive Learning Strategies:**
Students will be able to: **<u>Knowledge</u>** ● Define the terms associated with likelihood such as always, certain, likely, sometimes, impossible and never etc.	*Think, Pair & Share* ● *Pair students and provide them with a list of probability related terms (e.g. likely, unlikely, impossible, sometimes, etc.). Ask them to offer a definition of each term. Students will then provide an example of a situation in which each of the terms can be used to describe the*	Group work and oral presentation. ● Place students into groups. Provide each group with a scenario in which they are required to think about three possible outcomes. Students will give a brief presentation to state their

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies:</th><th>Inclusive Learning Strategies:</th></tr>
<tr>
<td>

Distinguish among the terms related to likelihood.
Identify the mode for a data set.
Understand the significance of the mode in a data set.

<u>Skills</u>

Use appropriate terms to describe the likelihood of events occurring.

<u>Values</u>

Work collaboratively to complete given tasks.
Willingly participate in activities
Ask questions to understand concepts relating to probability.

</td>
<td>
likelihood of its occurrence. They will share their work with the rest of the class.

Observation

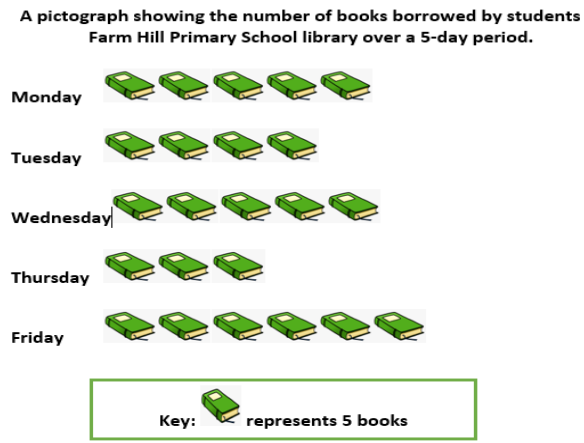
Present students with a data set (e.g. ages of students in the class, the number of times students are absent for the month). Observe students as they work on finding the mode. Ask students to explain its significance.

Product

Have students work in pairs to create a video to explain how to identify the mode of the data set presented in table form and on a picture graph.

A table showing the number of students on the Scho
Feeding Programme at Farm Hill Primary School over
6-month period.
<table>
<tr><th>Days</th><th>Number of students abse</th></tr>
<tr><td>September</td><td>75</td></tr>
<tr><td>October</td><td>52</td></tr>
<tr><td>November</td><td>60</td></tr>
<tr><td>December</td><td>75</td></tr>
<tr><td>January</td><td>96</td></tr>
<tr><td>February</td><td>75</td></tr>
</table>
</td>
<td>
predictions and justify the reasons for each.
<table>
<tr>
<td>The West Indies Cricket team intends to play three cricket matches against India. What are the possible outcomes of these matches?</td>
<td>At school, your first class usually begins at 9:00. For an entire week you recorded the time you arrived for your first class. What do you think will be the possible outcomes?</td>
<td>In your class of 20, you find that four other students are always competin g with you to get the highest grades in your maths class. Hence, early in the term you decided to work extremely hard. Discuss the</td>
</tr>
</table>
</td>
</tr>
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:



Game

Label four corners in the classroom (certain, impossible, likely , unlikely). Read aloud different scenarios/events that can fall under each of the headings/ labels. Have students move to the corner to show their answer choice.

		possible outcomes and give reason why
In 2021 and 2022, the Manchester airport in London records show that half of the incoming planes arrived from the Caribbean. If asked to predict how many planes will arrive from the Caribbean in 2023, what are your predictions?		

Graphic Organizer

- Provide students with a list of events to categorise as “certain”, “possible”,

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies:</th><th>Inclusive Learning Strategies:</th></tr>
<tr>
<td></td>
<td> 
Source : https://access.openupresources.org/curricula/our-k5-math/en/grade-1/unit-2/section-d/lesson-17/student.html</td>
<td>and “impossible”. Have students work in groups to classify each event and share their reasons.

<table>
<tr><td>Mr. Harry can build a concrete house in 5 minutes.
  </td><td>Our island will experience a tsunami.
  </td><td>Mrs. Lee is 30 years old. She will be 31 on her next birthday.
  </td></tr>
<tr><td>If today is Sunday, tomorrow will be Monday.
  </td><td>The sun will rise in the morning.
  </td><td>An iguana will drive a car from Sion Hill to Kingstown.
  </td></tr>
<tr><td>Our island will experience a volcanic eruption during the next 10 years.
  </td><td>Ann will meet our country’s Prime Minister on her trip to New York.
  </td><td>Kelly will roll a die and get a six (6).
  </td></tr>
</table>

Classify each of the following events in the table above using the headings in the table.
<table>
<tr><th>Certain</th><th>Possible</th><th>Impossible</th></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
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<tr><td></td><td></td><td></td></tr>
</table>

Video presentation

Probability For Kids (Likely, Most Likely, Least Likely, May Be & Never) | Probability Examples Math

Duration: 5:55 mins

Present the video clip to students to help them understand and distinguish among the</td>
</tr>
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		different concepts associated with probability/likelihood of events occurring.

Additional Resources and Materials

Probability! | Mini Math Movies | Scratch Garden

Tree diagram probability examples,

https://www.turtlediary.com/game/probability.html

Story: That's a Possibility! A Book about What Might Happen by Bruce Goldstone

Story: *A Very Improbable Story* by Edward Einhorn

Additional Useful Content Knowledge for the Teacher:

Probability is the likelihood of something happening. It is used in business, weather forecasts, sports, science and much more. The probability or likelihood of an event occurring can be expressed as a fraction, a percentage, on a number line, and by using probability vocabulary (certain, likely, equally likely, unlikely, and impossible).

Opportunities for Subject Integration:

Language Arts- Predicting outcomes in stories.

Social Studies - Using probability to draw conclusions about the population of their school, community etc.

Science - Predicting the likelihood of a magnet moving an object/ Predicting the likelihood of rain falling, sun shining etc.

Art/Craft - Creating a poster to show vocabulary related words and their meanings.

Data Handling and Probability ELO 4.2

Introduction to the Subject:

Strand (Topic): *Data Handling and Probability*

Essential Learning Outcomes: *Understanding and Applying Concepts of Probability - Calculating Probabilities*

Grade Level Expectations and/or Focus Questions: *Determine general probabilities (0 means impossible and 1 means certain) for specific real-world contexts and events.*

Focus Questions:

1. How do you calculate the probability of an event?
2. Why do we need to calculate the probability of an event?
3. How is the probability of an event important in real life?

<table>
<tr>
<th>Specific Curriculum Outcomes</th>
<th>Inclusive Assessment Strategies</th>
<th>Inclusive Learning Strategies:</th>
</tr>
<tr>
<td>

Students will be able to:

<u>Knowledge</u>

1. Differentiate between the terms 'impossible' and 'certain' in relation to real- life events.
2. Calculate the possibility of an event happening.
3. Define probability and its relationship to relative frequency of an item or event.

<u>Skills</u>

4. Classify events as being impossible or certain.
5. Calculate probabilities by counting the outcomes in a graph.
6. Solve simple problems involving probability.

<u>Values</u>

7. Willingly participate in activities in and outside the classroom that involve determining the probability of given life events occurring.

</td>
<td>

Oral presentation

Present various scenarios to groups of students. Instruct students to give a brief explanation on how they intend to determine the probability for each outcome.

Examples of scenarios

a. Seeing an elephant at La Soufriere
b. Christmas lights being sold in the week before Christmas.

Group work

Have students work in pairs to list at least three impossible events and three certain events.

Impossible events	*Certain events*
1. *2.* *3.* *4.*	*1.* *2.* *3.* *4.*

Observation

</td>
<td>

Classroom Games

<u>'Bag of Skittles'</u> - Give each student a bag of Skittles and ask them to list the different colours. Have them calculate the probability of receiving each colour recorded. Finally, let them compare the results with their peers.

Source: https://mathgeekmama.com/wp-content/uploads/2015/08/Skittles-Count-and-Graph-with-printables.jpg

Online Games

</td>
</tr>
</table>

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies:</th></tr>
<tr>
<td>8. Appreciate the use of probability as a measure of chance.

This section may also include relevant content related to each outcome.</td>
<td>Listen to students as they discuss their reasons for classifying given events as either impossible or certain. Students will be encouraged to justify their reasons.

Product

Students work in groups to complete an activity involving classifying real-life events as certain or impossible using the numbers 0 and 1.

<table>
<tr><th>Events</th><th>Probability (0 – Impossible, 1 – Certain)</th></tr>
<tr><td>a. Snow will fall in St. Vincent.</td><td></td></tr>
<tr><td>b. The sun will rise tomorrow.</td><td></td></tr>
<tr><td>c. Jack is eight years old, he will turn nine next year.</td><td></td></tr>
<tr><td>d. A goat giving birth to a kitten.</td><td></td></tr>
<tr><td>e. Today is Friday, tomorrow will be Thursday.</td><td></td></tr>
</table>

Product

Students complete worksheets on probability.</td>
<td>Have students engage in online games to practise calculating probability.

Students state the probability of each event.

https://wordwall.net/resource/55248583

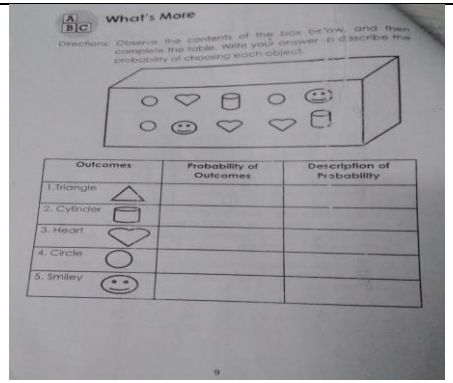
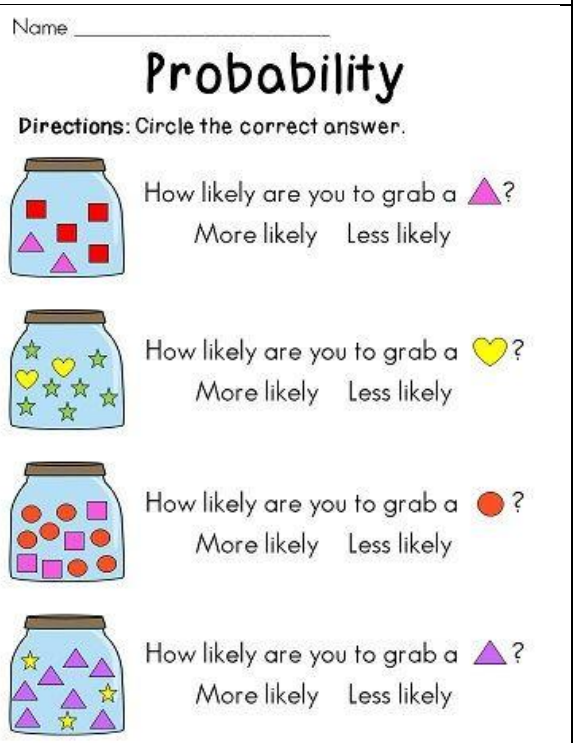
https://wordwall.net/resource/10826344

Gallery Walk

Have students work in groups to set up a center. Each center would have a scenario with simple probability, and several related questions to answer. Have students in groups of 3 4 workork together to answer the questions.

Independent Work

Have students complete worksheets independently to assess learning.</td>
</tr>
</table>

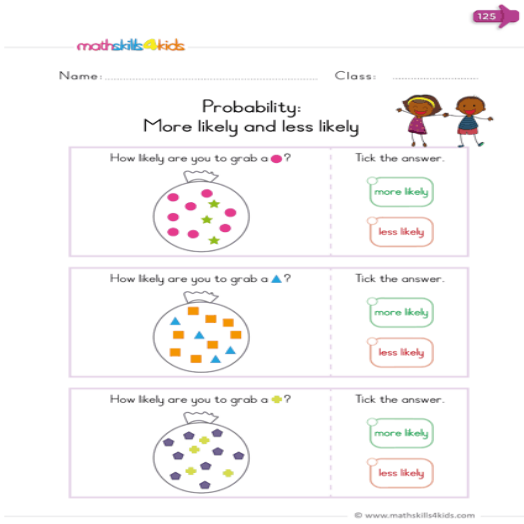
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies:
	 *Source: https://www.google.com/url?sa=i&url=https%3A%2F%2Fbrainly.ph%2Fquestion%2F16674404&psig=AOvVaw3ptXKgsSYL_oUEebOVjPLY&ust=1696431639778000&source=images&cd=vfe&opi=89978449&ved=0CBEQjRxqFwoTCNiMubyS2oEDFQAAAAAdAAAAABAa* ***Probability Story*** Students write a short story that includes events with different probabilities (e.g., likely, unlikely, certain). | Students used 3 or more terms correctly | Students used 2 terms correctly | Students used 1 term correctly | Students used no terms correctly | | --- | --- | --- | --- | | 3 | 2 | 1 | 0 |	 Source: https://i.pinimg.com/474x/f8/24/2e/f8242ed8aecb80b9cfea1bc63a25319b.jpg **Hands-on Activity** (Games) Roll a die: Use a die with six sides or you can use one with more sides for greater challenge.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies:
		Pupils will roll and find the probability of getting a particular number. Pull a card from a deck. Flip a coin: Have students take turns to flip a coin. Ask them to calculate the probability of getting a head/tail.

Additional Resources and Materials

Video: <u>Lesson Video: Probability: Certain, Possible, Impossible | Nagwa</u>

<u>Making predictions with probability | Statistics and probability | 7th grade | Khan Academy</u>



Source:https://mathskills4kids.com/kindergarten/worksheets/17.probability/18-1.probability-more-likely-and-less-likely.png

Additional Useful Content Knowledge for the Teacher:

Probability is the state that an event is likely to occur. It is calculated by dividing the number of favourable events by the total number of possible events. For example, what is the probability that we get a head if we toss a coin in the air. Number of favourable events is one because the coin has 1 head. Total number of possible events 2 (head and tail). Therefore the possibility would be 1 divided by 2 which gives a half.

Opportunities for Subject Integration:

Language Arts- Predicting outcomes of events in stories

Social Studies - Using probability to predict the time their country will celebrate their festive activities.

Science - Using probability to predict the weather for a specific day or week.

HFLE -

Art/Craft - Creating

Pattern and Relationship ELO P1.1

v

Introduction to the Subject: Identifies the purpose and goals of the subject area with links to the Vision and the Essential Education Competencies. Knowledge of the operations of numbers, which involves addition, subtraction, multiplication, and division, to grade 3 students is necessary since it builds a strong foundation in mathematics and helps them develop essential problem-solving and other mathematical skills and the confidence to tackle more advanced mathematical concepts in the future. These skills are not only valuable in academic settings but also in practical, real-world situations.

Learning how to compute numbers at the Grade 3 level will result in basic mathematical competency, where students will acquire fundamental mathematical skills essential for daily life and solving a wide range of mathematical problems.

The following are the goals of teaching these operations at this grade level:

Problem Solving: Teaching addition, subtraction, multiplication, and division equips students with the tools they need to solve a variety of real-world problems. These operations are used in everyday situations, from calculating prices and making changes to measuring ingredients for recipes.

Number Sense: Developing an understanding of how numbers work and how they relate to each other is a key component of numeracy. These operations help students develop number sense, enabling them to make estimations and understand the relative sizes of numbers.

Critical Thinking: Learning operations fosters critical thinking and logical reasoning skills. Students learn to analyze problems, identify the operations needed to solve them and apply the appropriate mathematical strategy.

Mathematical Fluency: Practicing operations improves mathematical fluency, which means students can perform calculations quickly and accurately. This fluency is important for more advanced math concepts in later grades.

Foundations for Algebra: The operations of numbers are the building blocks for more advanced mathematical concepts like algebra. Understanding how to manipulate and solve equations is a crucial skill built on a solid foundation of addition, subtraction, multiplication, and division.

Preparation for Higher Grades: Proficiency in these operations is essential for success in higher grades, as students will encounter more complex mathematical concepts and problem-solving tasks. Mastery of these basic operations is a prerequisite for understanding more advanced mathematics.

Communication Skills: Learning to express mathematical concepts and solutions through numbers, symbols, and words is important to mathematical literacy. It enhances students' ability to communicate their thought processes and solutions effectively.

Increased Confidence: As students become more comfortable with operations, they gain confidence in their mathematical abilities. This can positively impact their overall attitude toward math and their self-esteem.

Mathematical Reasoning: The operations of numbers encourage students to think critically and logically. They learn to analyze problems, choose appropriate strategies, and explain their reasoning, fostering mathematical reasoning skills.

Interdisciplinary Skills: Mathematical operations are used in various subjects beyond math, such as science, economics, and engineering. Proficiency in these operations enhances a student's ability to apply mathematical skills in other areas.

Life Skills: Beyond the classroom, understanding how to perform basic mathematical operations, such as budgeting, shopping, and measuring, is essential for making informed decisions in everyday life.

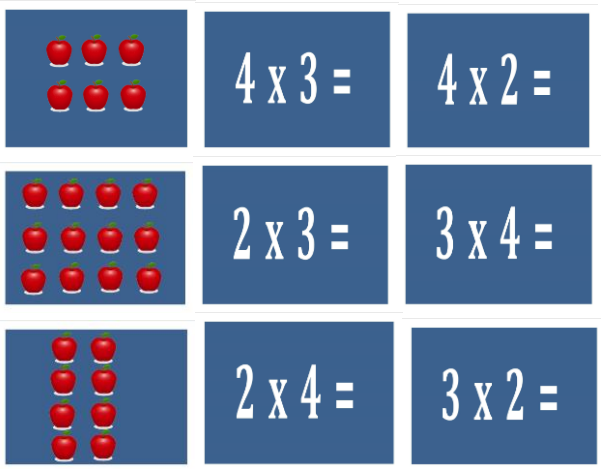
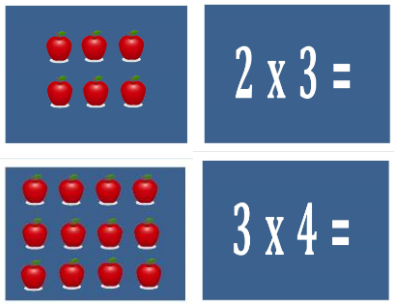
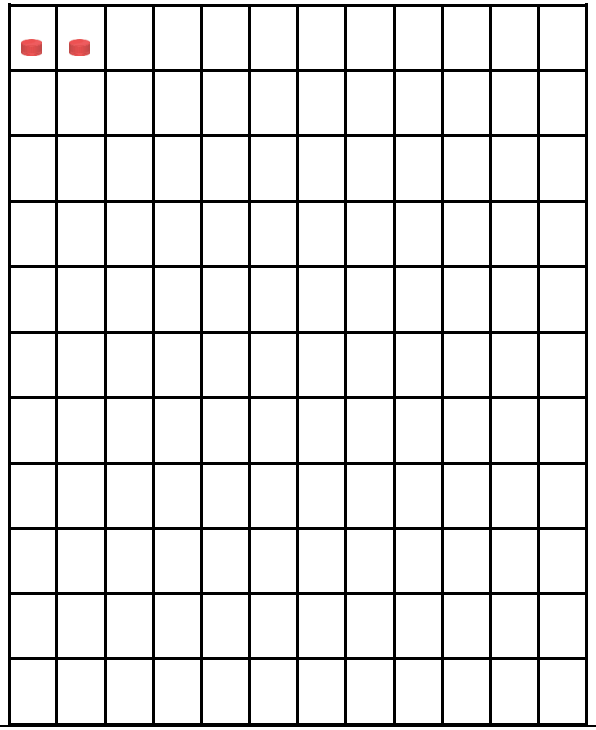
Strand (Topic): Pattern and Relationship

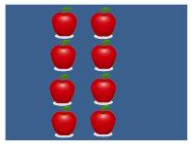
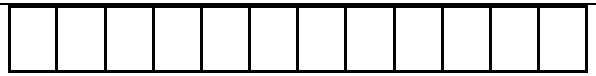
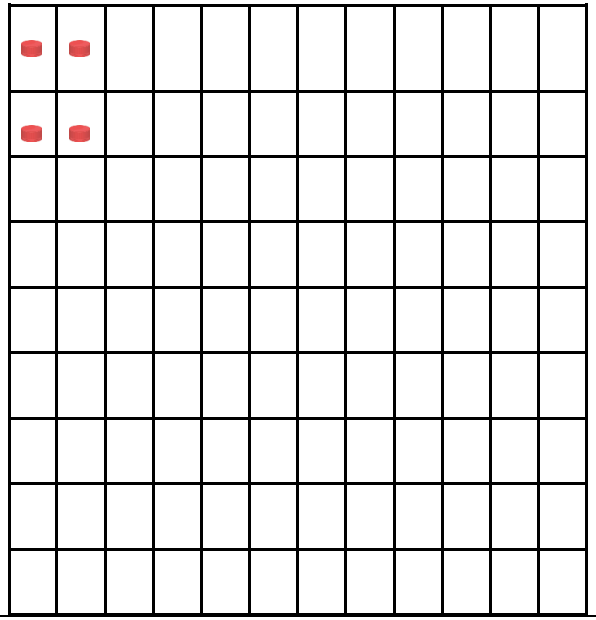
Essential Learning Outcomes:

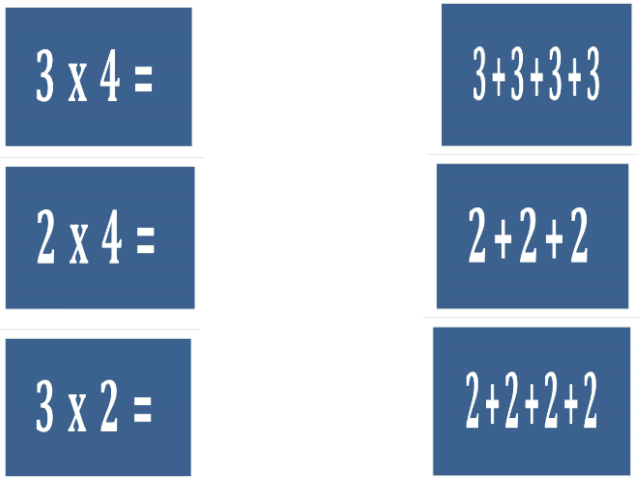
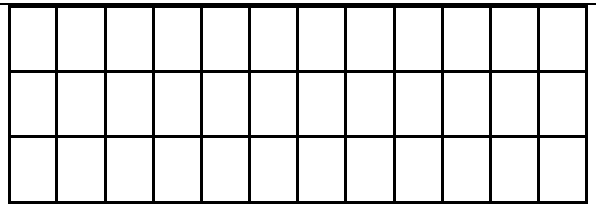
- **Essential Learning Outcome P1.1: Recognizing, describing and extending patterns – Repeating Patterns**

Grade Level Expectations and/or Focus Questions:

- identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts. Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends; demonstrate an understanding of patterns (repeating, growing, place value)

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
<u>Knowledge</u> - Identify the relationship between repeated addition when multiplying. - Describe the pattern in the product of numbers multiplied by 2-12 **<u>Skill</u>** - Discover patterns in multiplication fact families. - Justify your solution of the missing number in an addition or multiplication pattern. **<u>Values</u>** - Volunteer to solve authentic problems by discovering the patterns.	**Games** Pupils match arrays to multiplication number sentences. They find the corresponding number sentence for the array represented.  Responses: 	**Use of authentic materials or hands-on manipulatives/use of everyday objects** The learners will discover the relationship between multiplication and repeated addition. The 2 multiplication tables will be used to demonstrate. Other multiplication tables can be done in the same manner. Firstly, **the** learners make a set of two bottle caps on the grid. 

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 4 x 2 = Pupils match multiplication number sentences to repeated addition number sentences. 4 x 3 = 3 + 3 4 x 2 = 4+4+4 2 x 3 = 4 + 4	 Then the learners are asked: How many sets of two did you make? Answer: 1 set Here is how we represent 1 set of two using a multiplication number sentence. **1 x 2 = 2 means 1 set of 2 or 1 row of 2** To gain a greater understanding, especially to discover the relationship between multiplication and repeated addition, the learners represent 2 sets of two bottle caps on the same grid. 

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 **Group Work/Presentations** The learners are placed in groups. They use repeated addition to complete different multiplication tables. They then study the products found to discover patterns. ***5 Multiplication Table*** A. Complete the 5 multiplication table. 1 x 5 = 5 2 x5 = 10 3 x 5 = 4 x 5 =	 The learners are then guided to write a multiplication number sentence. They are asked: How many sets of two did you make? Answer: 2 sets of two.  **2 x 2 = 4 means 2 sets of 2** They are also asked: What did you do to one set of two to get two sets of two? Answer: Add one row of two/ The learners then represent two sets of 2 in an addition number sentence. **2 + 2 = 4** They are aided in seeing the pattern being developed.  **1 x 2 = 2 means 1 set of 2** **2**  **2 x 2 = 4 means 2 sets of 2** **2 +2 = 4** The learners are encouraged to follow the same pattern using bottle caps up to 12 sets of 2.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	5 x 5 = 6 x 5 = 7 x 5 = 8 x 5 = 9 x 5 = 10 x 5 = 11 x 5 = 12 x 5 = A. Answer the following questions: 1. What pattern do you see in the products of the 5-multiplication table? **Answer:** 5, 0, pattern in the ones place of the values. Also, the products are the numbers you say when counting by 5, starting with 5. 2. Study the numbers multiplied by 5 to get a product with 0 in the ones place. When is there a product with 0 in the ones place in the 5-multiplication table?	The same pattern is continued with three sets of 2. The learners are asked what must be done to two sets of 2 to get three sets of two. **Example:**  **3 x 2 = 6** **2 + 2 + 2 = 6** The learners are aided to come up with the conclusion: To find the next number in the two-multiplication table, you add 2. They are also guided with discovering the pattern for the repeated addition, for example: 1 set of 2 is represented in the following way using the multiplication sign. 1 x 2= 2 we cannot add 2 to anything to get 2, so we have one 2. 2 x 2 = 4 This means we have 2 sets of 2. There are two sets of 2, so we add 2 to itself. 3 x 2 = 6 It tells us we have 3 sets of 2. This tells us that we add 2 to itself 3 times. 2 + 2 + 2 = 6

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr>
<td></td>
<td>
Answer: When 5 is multiplied by an even number, the product has 0 at the end.

3. When does the product end with 5 in the ones place in the 5 multiplication table?
Answer: When 5 is multiplied by an odd number.

6 Multiplication Table
A. Complete the 5 multiplication table.

<table>
<tr><td>1 x 6 =</td><td>6</td></tr>
<tr><td>2 x 6 =</td><td>12</td></tr>
<tr><td>3 x 6 =</td><td></td></tr>
<tr><td>4 x 6 =</td><td></td></tr>
<tr><td>5 x 6 =</td><td></td></tr>
<tr><td>6 x 6 =</td><td></td></tr>
<tr><td>7 x 6 =</td><td></td></tr>
<tr><td>8 x 6 =</td><td></td></tr>
<tr><td>9 x 8 =</td><td></td></tr>
<tr><td>10 x 6 =</td><td></td></tr>
<tr><td>11 x 6 =</td><td></td></tr>
</table>
</td>
<td>
Now, the learners will complete the table below using the same pattern.

<table>
<tr><td>1 x 2 = 2</td><td>2</td></tr>
<tr><td>2 x 2 = 4</td><td>2 + 2 = 4</td></tr>
<tr><td>3 x 2 = 6</td><td>2 + 2 + 2 = 6</td></tr>
<tr><td>4 x 2 =</td><td></td></tr>
<tr><td>5 x 2 =</td><td></td></tr>
<tr><td>6 x 2 =</td><td></td></tr>
<tr><td>7 x 2 =</td><td></td></tr>
<tr><td>8 x 2 =</td><td></td></tr>
<tr><td>9 x 2 =</td><td></td></tr>
<tr><td>10 x 2 =</td><td></td></tr>
<tr><td>11 x 2 =</td><td></td></tr>
<tr><td>12 x 2 =</td><td></td></tr>
</table>
The slower learners are encouraged to use the grid to assist.

Response
<table>
<tr><td>1 x 2 = 2</td><td>2</td></tr>
<tr><td>2 x 2 = 4</td><td>2 + 2 = 4</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr>
<td></td>
<td>
<table>
<tr><td>12 x 6 =</td><td></td></tr>
</table>

B. Answer the following questions:
1. What patterns are the patterns found in the 6-multiplication table?
Answers: All the products are even.
There is a visible pattern in the ones column where the digits end with numbers in this pattern:
6, 2, 8, 4, 0.

2. Following the pattern 35, 42, 48, 54, 60, and 72, what number will come next?
Answer: 78

Checklist

A checklist is used to assess the learners understanding of multiplication fact families. The following activity will be given to the learners to complete. The learners will then use the assessment checklist to assess their understanding.

A. The learners are given numbers to create multiplication fact families.

1. 4. 20, 5
2. 42, 6, 7
3. 3,12,4
</td>
<td>
<table>
<tr><td>3 x 2 = 6</td><td>2 + 2 + 2 = 6</td></tr>
<tr><td>4 x 2 = 8</td><td>2 + 2 + 2 + 2 = 8</td></tr>
<tr><td>5 x 2 = 10</td><td>2 + 2 + 2 + 2 + 2 = 10</td></tr>
<tr><td>6 x 2 = 12</td><td>2 + 2 + 2 + 2 + 2 + 2 = 12</td></tr>
<tr><td>7 x 2 = 14</td><td>2 + 2 + 2 + 2 + 2 + 2 + 2 = 14</td></tr>
<tr><td>8 x 2 = 16</td><td>2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 = 16</td></tr>
<tr><td>9 x 2 = 18</td><td>2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 = 18</td></tr>
<tr><td>10 x 2 = 20</td><td>2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 = 20</td></tr>
<tr><td>11 x 2 = 22</td><td>2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 = 22</td></tr>
<tr><td>12 x 2 = 24</td><td>2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 + 2 = 24</td></tr>
</table>
What do you notice about the products of multiplying by 2?
Possible answers: add two each time to get to the following number.
- The products of multiplying by 2 are even numbers.
- The products are the numbers you say when you’re counting by 2 starting with 2.
</td>
</tr>
</table>

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr>
<td></td>
<td>
C. Write two multiplication fact families with a product of 18.
<table>
<tr><th colspan="3">Fact Families Assessment Checklist</th></tr>
<tr><td colspan="2">Create Fact, families,</td><td>Yes</td><td>No</td></tr>
<tr><td rowspan="2">1. 4, 20,5</td><td>4 x 5 = 20</td><td></td><td></td></tr>
<tr><td>5 x 4 = 20</td><td></td><td></td></tr>
<tr><td rowspan="2">2. 42, 6, 7</td><td>6 x 7 = 42</td><td></td><td></td></tr>
<tr><td>7 x 6 = 42</td><td></td><td></td></tr>
<tr><td rowspan="2">3. 3, 12, 4</td><td>3 x 4 = 12</td><td></td><td></td></tr>
<tr><td>4 x 3 = 12</td><td></td><td></td></tr>
<tr><td colspan="2">2 Fact Families with a product of 12</td><td></td><td></td></tr>
<tr><td colspan="2">3 x 6 = 18
6 x 3 = 18</td><td></td><td></td></tr>
<tr><td colspan="2">2 x 9 = 18
9 x 2 = 18</td><td></td><td></td></tr>
<tr><td colspan="2">1 x 18 = 18
18 x 1 = 18</td><td></td><td></td></tr>
</table>
</td>
<td>
The learners are asked to represent the following multiplication number sentences using repeated addition. Remember what the multiplication number sentence means.

Example: 6 x 7 =
Remember: 6 x 7 means 6 sets of 7 so
6 x 7 = 7 + 7 + 7 + 7 + 7 + 7 = 42
Complete the following using the same pattern.

a. 3 x 7 =
b. 5 x 4 =
c. 4 x 5 =

Responses:
a. 3 x 7 = 7 + 7 + 7
b. 5 x 4 = 4 + 4 + 4 + 4 + 4
c. 4 x 5 = 5 + 5 + 5 +5

Use of manipulatives
The learners study the 3 multiplication table. The learners use their understanding of the 2 multiplication tables to answer the following questions:
</td>
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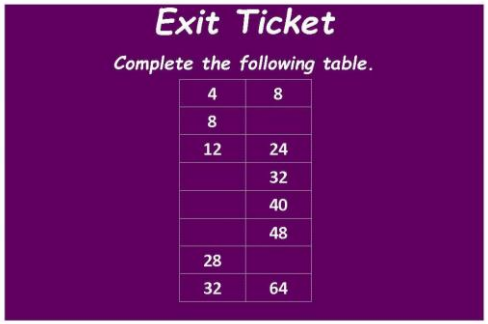
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies



Think, Pair, Share

The learners are presented with the information presented in a table. They study the relationship found in the information presented and then solve a problem. Guided questions are given to guide the process.

Study the table below to answer the following question.

a. How many eggs were laid in 12 days?
b. How long will it take the hens to lay 36 eggs?

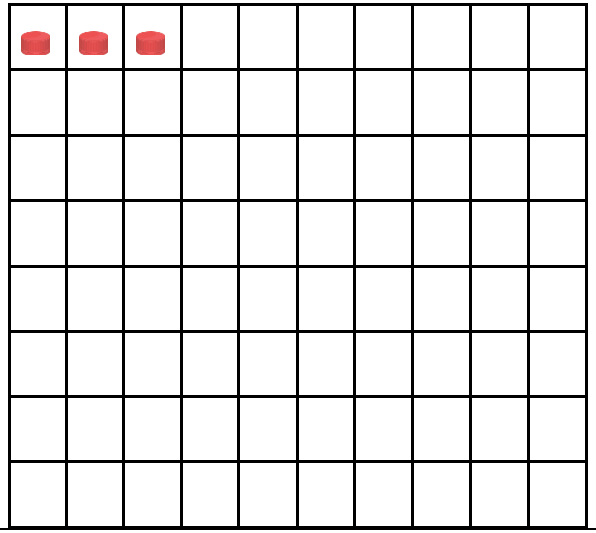
Table showing the number of eggs laid in a given number of days.

Number of days	Number of eggs laid
5	20

Multiplication Chart 1-12

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

1. What is the product of 1 x 3?
Answer: 3
2. How do we represent 1 x 3 using the bottle caps on the following grid?



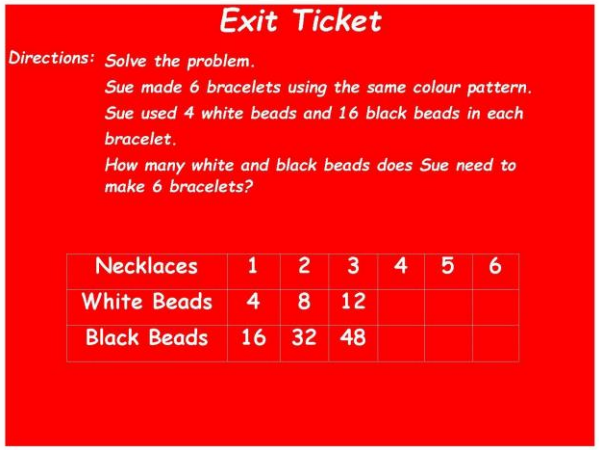
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies

10	**40**
15	**60**

Guiding questions

1. What is the common number that connects 5 and 20, 10 and 40 and 15 and 60?
2. How will you use this number with 12 to find the number of eggs laid in 12 days?

The learners shared how they arrived at their solutions.



3. What do we do to 1 x 3 to get 2 x 3?
Answer: add 3

4. 1 x 3 = 3
   2 x 3 = 6
What is three times 3 equal to?
What can we do to 6 to get the product of 3 x 3?

Answer: Add 3

5. What is the product of 4 x 3?
   1 x 3 = 3
   2 x 3 = 6
   3 x 3 = 9
   4 x 3 = _____
How will we get the product of 4 x 3?
Do you notice a pattern?

Answer: Every time one more set is added to the 3 multiplication table, we add three.
Starting from 3, we add three each time to get the products of the 3 multiplication tables.

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
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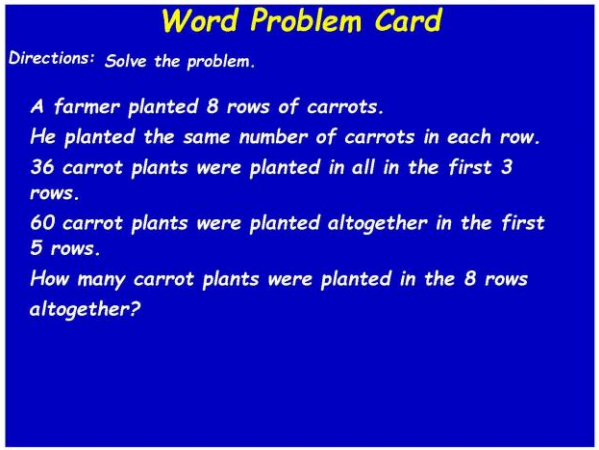
Think Pair Share
The learners are placed in pairs. They read the problem, pair up to solve it, then present their solution to the class.


</td>
<td>
The learners use the skip counting by three to complete the following table:
<table>
<tr><td>1 x 3</td><td>3</td></tr>
<tr><td>2 x 3</td><td>6</td></tr>
<tr><td>3 x 3</td><td>9</td></tr>
<tr><td>4 x 3</td><td>12</td></tr>
<tr><td>5 x 3</td><td></td></tr>
<tr><td>6 x 3</td><td></td></tr>
<tr><td>7 x 3</td><td></td></tr>
<tr><td>8 x 3</td><td></td></tr>
<tr><td>9 x 3</td><td></td></tr>
<tr><td>10 x 3</td><td></td></tr>
<tr><td>11 x 3</td><td></td></tr>
<tr><td>12 x 3</td><td></td></tr>
<tr><td>13 x 3</td><td></td></tr>
<tr><td>14 x 3</td><td></td></tr>
<tr><td>15 x 3</td><td></td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr><td></td><td></td><td>The learners are asked: Do you see a pattern in the 2 and 3 multiplication tables?

Answer: They both require skip counting. When we multiply by two, we add 2 each time, and when we multiply by 3, we add three each time.
The products of the 2 multiplication tables are all even numbers.
There is a pattern in one's column where the digits end with 2, 4, 6, 8, and 0, and the pattern repeats.
When a number is multiplied by one, we get the same number.

The learners are asked to use skip counting to complete the 4-multiplication table.

<table>
<tr><td>1 x 4 =</td><td>4 =</td><td>4</td></tr>
<tr><td>2 x 4 =</td><td>4 + 4 =</td><td>8</td></tr>
<tr><td>3 x 4 =</td><td></td><td></td></tr>
<tr><td>4 x 4 =</td><td></td><td></td></tr>
<tr><td>5 x 4 =</td><td></td><td></td></tr>
<tr><td>6 x 4 =</td><td></td><td></td></tr>
<tr><td>7 x 4 =</td><td></td><td></td></tr>
<tr><td>8 x 4 =</td><td></td><td></td></tr>
<tr><td>9 x 4 =</td><td></td><td></td></tr>
</table>
</td></tr>
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies

10 x 4 =		
11 x 4 =		
12 x 4 =		

Student responses:

1 x 4 =	4 =	4
2 x 4 =	4 + 4 =	8
3 x 4 =	4 + 4 + 4 =	12
4 x 4 =	4 + 4 + 4 + 4 =	16
5 x 4 =	4 + 4 + 4 + 4 + 4 =	20
6 x 4 =	4 + 4 + 4 + 4 + 4 + 4 =	24
7 x 4 =	4 + 4 + 4 + 4 + 4 + 4 + 4 =	28
8 x 4 =	4 + 4 + 4 + 4 + 4 + 4 +4 + 4 =	32
9 x 4 =	4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 =	36
10 x 4 =	4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 =	40

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		<table><tr><td>11 x 4 =</td><td>4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 =</td><td>44</td></tr><tr><td>12 x 4 =</td><td>4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 =</td><td>48</td></tr></table> Is there a visible pattern in the product of the 4-multiplication table? Response: All the products are even numbers. The values in the ones place follow a pattern of 4, 8, 2., 6, 0. **Discussions** The learners learn about multiplication fact families. The two multiplication number sentences make a multiplication fact family. **3 x 2 = 6** **2 x 3 = 6** What do we notice about the numbers used? **Answer:** The same numbers are used. Even when the two multiplier and multiplicand positions are exchanged, the product is the same. This tells us the commutative property of the multiplier, and multiplicand allows for the positions of these numbers to be swapped without changing the product.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		The learners are asked to find a fact family from the multiplication chart in pairs. The learners are asked: Why do you think it is important to know about the commutative properties of numbers when multiplying them? The learners discuss the importance of this information and how this knowledge can be used when multiplying. **Multiplication Chart 1-12** The learners study the multiplication tables and answer the following questions? 1. What kind of number is the product of multiplying any number by an even number? a. odd b. even 2. What kind of number is the product of multiplying any odd number by an even number?

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		a. odd b. even 3. What kind of number is the product of multiplying any odd number by an odd number? a. odd b. even **Group or Pair Work** The learners are engaged in looking for relationships between the 2 and 4, 3 and 6, 4 and 8, and 5 and 10 multiplication tables using a multiplication chart. **2 and 4 multiplication tables** Questions 1 x 2 = 2 1 x 4 = 4 2 x 2 = 4 2 x 4 = 8 3 x 2 = 6 3 x 4 = 12 Are you seeing a pattern? We multiply 1 x 2, and we get to and 1 x 4 and we get 4. What is multiplied by 2 to get 4? 2 x 2 = 4 and 2 x 4 = 8. What do we multiply by 4 to get 8? Through discussions the learners should discover a pattern of doubling. Manipulatives can be used to assist the slower learners in discovering the pattern.

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr><td></td><td></td><td>

3 and 6 multiplication tables

The learners vertically list the products of the 3 times tables and then the 6 times tables in a table like the one shown below.

<table>
<tr><td>3</td><td>6</td></tr>
<tr><td>6</td><td>12</td></tr>
<tr><td>9</td><td>18</td></tr>
<tr><td>12</td><td>24</td></tr>
<tr><td>15</td><td>30</td></tr>
<tr><td>18</td><td>36</td></tr>
<tr><td>21</td><td>42</td></tr>
<tr><td>24</td><td>48</td></tr>
<tr><td>27</td><td>54</td></tr>
<tr><td>30</td><td>60</td></tr>
<tr><td>33</td><td>66</td></tr>
<tr><td>36</td><td>72</td></tr>
</table>

They are encouraged to double the answers in the same row as the 3 times tables to find the products for the 6 times tables. They then verify their responses using the multiplication chart.

</td></tr>
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		The learners are asked if there is a pattern of doubling. They discuss the ways this can be useful. They investigate whether there is a pattern of doubling between 4 and 8, 5 and 10 and 6 and 12 times tables. The students should conclude the following: All products of 4 are double the products of 2. The products of 6 are double the products of 3. Also, all products of 8 are twice the products of 4, and all products of 10 are twice those of 5.

Additional Resources and Materials *(Additional material and resources that are not included in the Inclusive Learning and/or Inclusive Assessment Strategies that may be useful for lesson planning)*
Additional Useful Content Knowledge for the Teacher: (*any additional knowledge that the writers believe would be helpful for the teacher, such as reading material at a lower or higher grade level, links to curriculum documents for other grades)*
Opportunities for Subject Integration: *(Additional ideas about how the inclusive learning strategies might be adapted and/or applied to include other subjects in the curriculum)*

Strategies that Support the Curriculum and Assessment Framework

This section is optional and intended to assist writers as they check the curriculum to the Curriculum and Assessment Framework. It can be used at the discretion of the Team Leads and PICT Subject Specialists. It will be used to guide the writing but will not appear in the curriculum guides.

Elements that are integrated across subjects:

Elements from Local Culture, Technology, TVET, and Environment that are integrated:

Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

Introduction to the Subject: *Identifies the purpose and goals of the subject area with links to the Vision and the Essential Education Competencies.*
Strand (Topic): Pattern and Relationship
Essential Learning Outcomes: P1.2 Recognizing, describing and extending patterns – Increasing and Decreasing Patterns
Grade Level Expectations and/or Focus Questions: - Demonstrate understanding patterns (repeating, increasing, decreasing, place value) by identifying, describing, reproducing, extending, creating, translating from one representation to another and sorting. - Can describe a pattern rule. - Create and describe patterns to illustrate relationships among whole numbers up to 1000.

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies:</th><th>Inclusive Learning Strategies:</th></tr>
<tr>
<td>.

<u>Knowledge</u>
1. Identify and copy repeating elements in a repeating pattern.

2. Explain the rule used to create a repeating nonnumerical pattern.
3. Identify the rule in an increasing and decreasing pattern.
4. Identify errors in an increasing and decreasing pattern.</td>
<td>SCO 1, 2, 5

Observe students as they work.
Observation Checklist
<table>
<tr><th>Behavioural Criteria</th><th>E</th><th>S</th><th>NI</th></tr>
<tr><td>1. Make a repeating pattern.

2. Students identify the pattern core/element.</td><td></td><td></td><td></td></tr>
</table>
</td>
<td>SCO 1, 2, 5

Distribute Pattern blocks to students. Model the following pattern below for students and have them copy the pattern with their blocks.

Figure 1
 

Have students identify the shapes represented in the pattern. Have students observe the shapes</td>
</tr>
</table>

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies:</th><th>Inclusive Learning Strategies:</th></tr>
<tr>
<td><u>Skills</u>
5. Translate a pattern to a different medium (e.g., clap, jump, clap, jump instead of triangle, circle, triangle, circle).
6. Represent an increasing and decreasing pattern concretely and pictorially and explain the rule.
7. Extend the element in an increasing and decreasing pattern.
Identify and describe increasing and decreasing patterns in various contexts (e.g., a hundred chart, number line, addition tables, a calendar, a tiling pattern, or drawings).
8. Solve a problem using increasing and decreasing patterns.

<u>Values</u>
9. Create problems with repeating and increasing environmental patterns (e.g., house/room numbers, flower petals, book pages, calendar, pine cones, leap years).

This section may also include relevant content related to each outcome.</td>
<td>
<table>
<tr><td>3. translate the pattern using different mediums</td><td></td><td></td><td></td></tr>
</table>
E -Excellent, S- Satisfactory, NI- Needs Improving

SCO 3, 6, 7

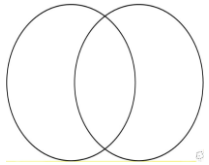
Think Pair Share

Allow learners to work in small mixed-ability groups. Observe them as they generate ideas for finding the pattern rules. Listen as they discuss with peers. Allow them to explain how they derive their answer and reasons for selected pattern rules. Encourage discussion on basic addition or subtraction.

SCO 3, 6, 7

<table>
<tr><td>Behavioural Criteria</td><td>E</td><td>S</td><td>NI</td></tr>
</table>
</td>
<td>and identify similarities and differences between the shapes.

Comparisons will be represented on a Venn Diagram.

Guided Questions

What shapes are in the pattern? (square and Triangle)
How can we compare and contrast the attributes of the shapes?

Have students then identify the shapes and name them as they are represented, naming the repeating pattern (triangle, square, square, triangle square, square...)

Guided Questions
1. What is a pattern element/core? (what is being repeated)?
2. What type of pattern is being represented?
3. Other than the shapes, is there another core that can be represented in the pattern? (green, orange, orange)
4. Can you continue the pattern?
5. What if I added triangle and triangle squares to the pattern? (Have students</td>
</tr>
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:

1. Represent the pattern using manipulatives. 2. Students identify pattern rules. 3. Extend the pattern using the pattern rule.			

E -Excellent, S- Satisfactory, NI- Needs Improving

Specifically consider how these:
Support learner-centred assessment.
Inform teaching and learning
Affirms identity
Support differences in learners

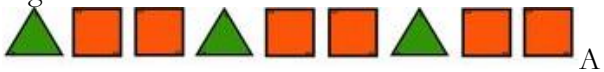
Each assessment included in this section should outline the purpose of the assessment and the type of assessment (conversation, observation, product, etc.) and provide samples of the assessment tools (rubrics, checklists, etc.)

It will not be necessary to provide an assessment strategy for each SCO; SCOs may be clustered, and some assessment strategies will give overall indications of progress within the ELO.

model it and identify that there is an error in the pattern element.)

Model how to translate a pattern with students using mediums.

Figure 2



B B A B B A B B

3 4 4 3 4 4 3 4 4

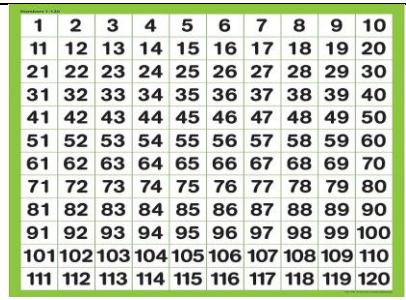
Ask students to think-pair-share to translate the pattern using verbs(actions). For example.: clap, snap, snap or sit, jump, jump)

Group work
In groups of 2-3, students will use any items in the class to create a repeating pattern, identify the pattern element, translate the pattern using different mediums, and continue the pattern.

SCO 3, 6, 7

Next to the previous pattern, have students model the following pattern using the squares. Have students compare and contrast the previous pattern with this new pattern. (This pattern is getting bigger instead of repeating; therefore, it is an increasing pattern))
Have students identify the numbers below the pattern.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		Students will identify the pattern rule. One way to find the pattern rule is to subtract two elements next to each other. Example 8-6 = 2; therefore, the rule is adding 2. Figure 3  2 4 6 8 Have students extend the pattern using the rule. Write 3, 6, 9, ____, ____ Have students represent the data using manipulatives, using Figure 3 as a model. Have students Identify the pattern rule and extend the pattern. Repeat with the following: 5, 10, 15, _____, _____ 4, 8, ___, _____, _____ Explain that for bigger 2-digit numbers, a number chart can be used. Another way is to use a number chart to count the number of jumps.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		 83, 86, 89, ____, ____, ____ 26, 28, ____, ____, 34, ____ Challenge 7, 6, 5, ____, ____ Students will identify that this pattern is the inverse/opposite that decreases instead of increases. Guided questions: How is this pattern different from the one pattern before? How would we find the rule? (subtract) **SCO 9** ***MATH TALK*** Students will engage in think-pair-share to name the 3 types of patterns learnt for the day's lesson. They will also give examples of each type of pattern in the real world. 1. repeating pattern

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		2. increasing or growing pattern 3. decreasing pattern *Specifically, consider how this support:* *Equitable learning* *Meaningfully constructed learning* *Deep and comprehensive learning* *Identify affirmation* *Learner difference* *Each learning strategy outlines the materials that will be used for the strategy.*

Additional Resources and Materials

(Additional material and resources that are not included in the Inclusive Learning and/or Inclusive Assessment Strategies that may be useful for lesson planning)

- Pattern blocks
- Unifix blocks
- 2D shapes manipulatives
- Number chart
- Number line

Additional Useful Content Knowledge for the Teacher: (*any additional knowledge that the writers believe would be helpful for the teacher, such as reading material at a lower or higher grade level, links to curriculum documents for other grades)*

A repeating pattern repeats the same pattern element over and over.
The Pattern element is what is repeated in a repeating pattern.
An increasing pattern is a pattern in which one or more elements of the sequence or arrangement increases.
An increasing pattern is a pattern in which one or more elements of the sequence or arrangement decreases.
The pattern rules tell how much a pattern increases or decreases.

Opportunities for Subject Integration: *(Additional ideas about how the inclusive learning strategies might be adapted and/or applied to include other subjects in the curriculum)*

Science:
Repeating patterns in the different life cycles and the water cycle.
Increasing patterns in living things.

Language:
Increasing Pattern in Sequencing.

Arts and Craft
Repeating pattern in Tessellation. A tessellation or tiling is the covering of a surface, often a plane, using one or more geometric shapes called tiles, with no overlaps and no gaps.
Repeated and Increasing patterns can be found in crocheting and basket weaving.

Music
Patterns can be found in Rhythm, melody, harmony, and musical composition.
Increasing pattern in crescendo.

Strategies that Support the Curriculum and Assessment Framework

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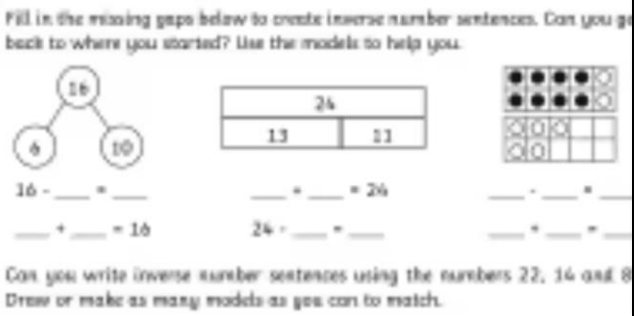
Elements that are integrated across subjects:

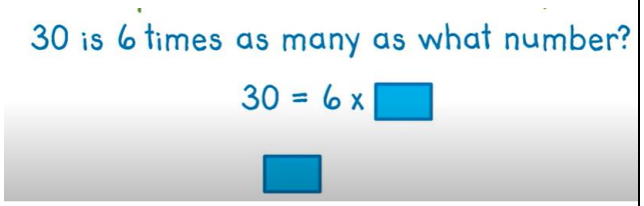
Elements from Local Culture, Technology, TVET, and Environment that are integrated:

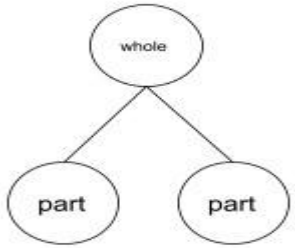
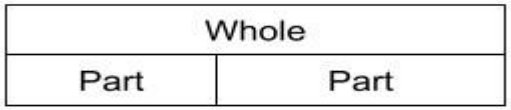
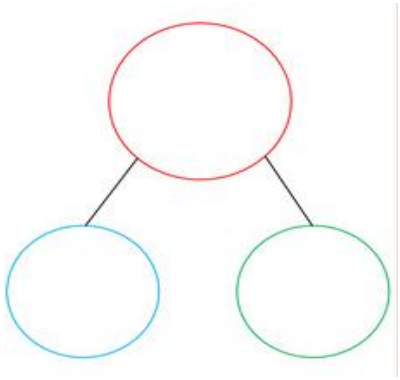
Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

Introduction to the Subject: *Identifies the purpose and goals of the subject area with links to the Vision and the Essential Education Competencies.*
Strand (Topic): Pattern and Relationship
Essential Learning Outcomes: P2.1 Variables and Relationships – Representing Unknowns
Grade Level Expectations and/or Focus Questions: - Represent the idea of a variable as an unknown quantity using a letter or a symbol; - Can solve simple, open sentences with one unknown for addition and subtraction up to two 4-digit numbers and multiplication and division fact families.

Specific Curriculum Outcomes	**Inclusive Assessment Strategies:**	**Inclusive Learning Strategies:**
(Note not all 3 below need to be explicitly identified for each SCO, but the presence of all three should be apparent. **<u>Knowledge</u>** 1. Identify the inverse function of operations. (Example: 4 + 5 = 9, 9-5=4) 2. Represent an unknown quantity. with a letter or symbol can be used to represent **<u>Skill</u>** 3. Use the part-part-whole model to demonstrate the inverse function of	**Conversation (peer assessment**) Student will work with a peer. One student will write a question using a different operation, and the other student write the inverse of the problem. For example One student may write: **15 - 6 = 9** Another student is asked to figure out what they could add to 6 to get the answer 15. Hence, this changes the sum from subtraction to an addition to find the answer. **6 + 9 = 15** **Using Multiplication and Division**	*SCO# 1, 2* 

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
operations. 4. Use the part-part-whole model to solve open sentences in addition/ subtraction and multiplication and division fact families. **<u>Value</u>** 5. Demonstrate a positive attitude when solving problems with one unknown.	For example, one students will write the problem 12÷ 3 = **4 and another student must** recognize that the inverse of division is multiplication and that this sum can also be solved by expressing it as **4** x 3 = 12. Students will justify their answers. Word problems *One student may say, I'm thinking of a number. I added 4 to it. I divide it by 2. I ended up with 17. What number was I thinking of?* Another student solves the problem and justifies the solution. **SCO 3 &4 Product (self-assessment)** **Students will complete the worksheet and be given a mark scheme to provide feedback on their work. For example,**  Fill in the missing gaps below to create inverse number sentences. Can you g back to where you started? Use the models to help you. 16 6 10 24 13 11 16 - ___ = ___ ___ + ___ = 16 ___ + ___ = 24 24 - ___ = ___ ___ - ___ = ___ ___ + ___ = ___ Can you write inverse number sentences using the numbers 22, 14 and 8 Draw or make as many models as you can to match.	Display the picture above to students. Have them describe what they see. Explain that people used symbols or letters in ancient times to represent unknown or hidden things in real life (e.g., secret codes, ancient hieroglyphs). Create a code that students must decipher using the hieroglyphics key as the clue. Code 1  (33) Code 2  (325) Introduce the concept of using letters or symbols in math to represent unknown quantities, such as A, B, X, Y, OR, and explain that these are called variables. Display the following for students to see. __ + 5 = 12. Explain that a letter can be used to represent the missing value.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Retrieved from https://www.twinkl.co.uk/resource/wl-inverses-differentiated-activity-sheets. **SCO 2 & 5:** Solving problems involving equations orally and giving reasons for solutions. For example:  .	Example: a + 5 = 12 or x + 5 = 12 Explain that to solve the equation, the inverse/opposite operation can be used. Guided questions What operation is being used in the number sentence/equation? What is the inverse of the opposite of that operation? (addition's inverse is subtraction) Is an addend or sum missing from the equation? Challenge students to use the numbers in the equation to create the inverse number sentence in the equation. (Hint: Read the equation from right to left) a + 5 = 12 12 - 5 =a **SCO 3 & 4** After monitoring student discussion and solutions. Introduce the following models as solutions to simplify.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		 cherry diagram  Bar model For addition and multiplication: part + part = Whole (Small + Small = Big) For subtraction and division: Whole - part = part (bigger - small = smaller) Have students input the digits into the model. 

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		Guided questions: What is the operation represented in the number sentence? Which pattern does addition follow: part + part = whole or Whole - part = part? Which number represents the whole in the equation? (12) Which number represents the parts in the equation? (5 & a) What number sentence will be represented? . Represent 12-7=a a= 5 therefore 7 + 5 = 12 Show 25 - x = 10 In groups, have students think-pair and share how they would use the part-whole model to solve the following equation. The guided questions below to guide students to the solution. **Guided questions** What is the whole? (21) What are the parts? (10 and X) The Teacher will explain that using the inverse is unnecessary for this equation. Subtraction can be

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		used instead, where the 2 parts are switched in the equation/. 25-x =10 25-10=x x=15 Repeat the process with the multiplication sentence below. 4 x b= 20 Ask students to name the inverse of multiplication. (division). Students will represent the information on the part-whole chart. 4 x b = 20 20 / 4 = b b = 5 The teacher will play; I'm thinking of a number game with students. Students will write the equation and use the inverse and part-whole method to solve. 6. I'm thinking of a number when added to 15, gives a sum of 36. (b + 15 =36, part = b, 15 whole = 36 36 -15 = b, b = 21

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		7. I'm thinking of numbers when divided into 45, which gives a quotient of 9. (45 / x =9) 8. Switch the parts to 45 /9= x, x=5) • Give students word problems involving unknown quantities and ask them to write and solve equations using variables. • Provide different levels of difficulty to cater to students' varying abilities. • Encourage students to explain their thinking and reasoning behind their equation choices. • Allow time for students to work individually or in pairs and provide support as needed.

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies:</th><th>Inclusive Learning Strategies:</th></tr>
<tr><td></td><td>

<u>SCO 3 & 4</u>

Observation:

Use the following observational checklist below to monitor learners as they engage in variables and sharing activity.

<table>
<tr><th>Behavioural Criteria</th><th>E</th><th>S</th><th>NI</th></tr>
<tr><td>1. Identifies the whole.
2. Identifies the parts.
3. Identifies inverse operation.
4. Completed the part-whole model
5. finds the number that the variable represents.</td><td></td><td></td><td></td></tr>
</table>

E -Excellent, S- Satisfactory, NI- Needs Improving

</td><td></td></tr>
</table>

Additional Resources and Materials

(Additional material and resources that are not included in the Inclusive Learning and/or Inclusive Assessment Strategies that may be useful for lesson planning)

Additional Useful Content Knowledge for the Teacher: (*any additional knowledge that the writers believe would be helpful for the teacher, such as reading material at a lower or higher grade level, links to curriculum documents for other grades)*

Key Vocabulary

Variable Unknown Symbol Equation

A **variable** is an alphabet or term representing an unknown number, value, or quantity.

Inverse operations are opposite operations. They are the operation that reverses the effect of another operation.

Opportunities for Subject Integration: *(Additional ideas about how the inclusive learning strategies might be adapted and/or applied to include other subjects in the curriculum)*

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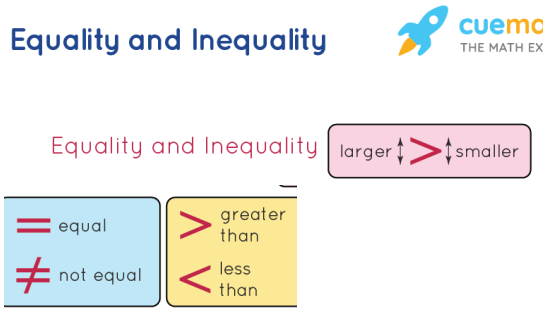
Elements that are integrated across subjects:

Elements from Local Culture, Technology, TVET, and Environment that are integrated:

Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

Introduction to the Subject: *Identifies the purpose and goals of the subject area with links to the Vision and the Essential Education Competencies.*
Strand (Topic): Pattern and Relationship
Essential Learning Outcomes: Variables and Relationships – Understanding and Representing Equivalence
Grade Level Expectations and/or Focus Questions: - Can determine if and explain why two given quantities are equal or unequal; - Apply properties to determine equality and inequality (quantities over 100, distance, area, arithmetic expressions)

Specific Curriculum Outcomes	**Inclusive Assessment Strategies:**	**Inclusive Learning Strategies:**
<u>Knowledge</u> 1. State the definition of the following vocabulary words:" equal, unequal, quantity, and compare. 2. Use equal and unequal symbols correctly when comparing. **<u>Skill</u>** 3. Demonstrate how to compare two quantities using symbols such as = for equal and ≠ not equal, > for greater than and < for lesser than. **<u>Value</u>**	<u>SCO 1 & 2</u> Students will use prior knowledge on what they know about the different terms listed in the objectives. <u>SCO 9</u> **Pop Quiz** Students will be given a sheet of paper with a series of number comparisons using equal and unequal symbols. Have students circle the correct symbol for each comparison within a time limit of 2 minutes. Collect the papers and review the answers together.	**SCO 1 & 2**  • Each student will be given a card with a word, symbol or definition. They will be given a certain amount of time to find the person that matches their symbol, word or definition. They will then present to the class what their word or symbol means.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
4. Recognize the importance of equality in solving problems.	**Compare using the Symbols** Using a set of visual representations, such as number lines or bar models, the student will accurately compare numerical expressions using the equal and unequal symbols, showing an understanding of their meaning and application.	**SCO 3** **Symbol Relay Race** Divide the class into teams. Give each team a whiteboard and marker. Call out a number comparison or number sentence comparison using equal or unequal symbols, and the first student from each team must correctly write the symbol on their team's whiteboard. The first team to hold up the correct symbol gets a point. Repeat with different comparisons for a few rounds and declare the winning team at the end. **<u>Guided Question</u>** Why is it important to correctly use equal and unequal symbols when comparing numbers?

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Opportunities for Subject Integration: *(Additional ideas about how the inclusive learning strategies might be adapted and/or applied to include other subjects in the curriculum)*

Arts & Crafts/ Engineering

- *Students can create the equal & inequality symbols using popcicile sticks. They can use what they create to compare different objects in sets or number sentences.*
- *Students can draw and design floor plans using rectangles and squares and then find the area of each room or the total area of the room.*

Language Arts

- *Comprehension - Students will listen to stories being read to them and can answer questions based on what they learnt from the story. They can also do a journal entry and write a summary of the book that was read to them.*
- *Students can complete journal entries by answering different questions from their topic or objective.*
- *Compare and contrast Area and Perimeter*

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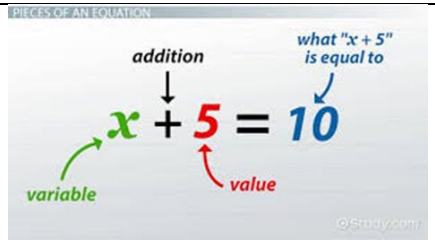
Elements from Local Culture, Technology, TVET, and Environment that are integrated:

Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

Introduction to Topic:
Strand (Topic): Pattern and Relation ELO O2.3
Essential Learning Outcomes: ***Essential Learning Outcome 2.3 Variables and Relationships – Writing Expressions and Equations*** ***Can represent and explain, concretely and in writing, the preservation of equality in addition and subtraction using simple, open sentences.***
Grade Level Expectations and/or Focus Questions: Can represent and explain, concretely and in writing,

Specific Curriculum Outcomes	***Inclusive Assessment Strategies***	**Inclusive Learning Strategies**
<u>Knowledge</u> 1. Identify variables (represented as letters or symbols) within mathematical expressions or equations. 2. Write simple mathematical expressions using variables to represent unknown quantities (e.g., 3 + x = 7). 3. Write basic equations using variables, demonstrating the concept of equality (e.g., x + 5 = 12). **<u>Skills</u>** 4. Recognize relationships between numbers and variables in simple mathematical contexts.	**SCO 1, 2 &3** **Story Problems** ***The Farmer's Field*** *A farmer has n apples in one basket and 4 apples in another basket. If he combines both baskets, he will have 15 apples in total. Write an equation to show how many apples the farmer initially had.* ***Example Response:*** $n+4=15$ ***The Pizza Party:*** *Emily ordered p pizzas for her party. After everyone had their share, there were 3 pizzas left. If she started with 10 pizzas, write an equation representing the situation.* *Example Response:* $p-3=10$	**SCO 1,2 &3** **Manipulatives:** Use concrete materials that students can relate to in their daily lives. Use objects like mangoes, blocks, candies, or toys to demonstrate the concept of equality. Engage students in hands-on activities that involve sorting and grouping objects to explore equality. Have them sort objects into equal groups and discuss why they are equal. additionally, allow students to create a blank group to represent the unknown.

Specific Curriculum Outcomes	*Inclusive Assessment Strategies*	Inclusive Learning Strategies
5. Solve basic addition and subtraction equations to find the variable's value (e.g., x - 3 = 8, x = 11). **<u>Value</u>** 6. Create word problems involving variables, requiring classmates to write equations to solve them.	**SCO4 and 5** **Varied Representation:** Provide problems in various formats. Some students might excel with equations, while others may benefit from visual representations or word problems. **Equation-Based Problem** ***Problem 1:*** *Solve for x: 4+x=9* **Visual Representation:** **Problem 2:** *Use the number line to show the relationship between 3 and 8. Place a mark where the variable x would be.* 0 1 2 3 4 5 6 7 8 9 10 |__|__|__|__|__|__|__|__|__|__|__| x 3 =8 ***Word Problem:*** **Problem 3:** *Jenny had some apples. She ate 3 apples, and now she has 7 apples. How many apples did she have at the beginning? Write an equation to represent this.* **SCO 6** **Math Journals:** ***Strategy:*** *Assign students to keep math journals where they create word problems involving variables. They can illustrate the scenarios to aid understanding.*	 <u>https://study.com/academy/lesson/how-to-write-equations-formulas.html</u> **SCO4 and 5** **Games** **Number Line Hopscotch:** ***How to Play:*** *Use masking tape to create a number line on the floor. Assign different mathematical operations (e.g., +2, -3) to specific numbers. Students take turns hopping on the number line, following the operations to determine their next hop.* **SCO 6** **Guided Examples:** ***Strategy:*** *Begin with guided examples where the teacher models creating a word problem with a variable and writing the corresponding equation.* ***Implementation:*** *Collaboratively create a sample word problem as a class, discussing the thought process and the steps involved.*

Specific Curriculum Outcomes	*Inclusive Assessment Strategies*	**Inclusive Learning Strategies**
	Implementation: *Periodically, students swap journals and solve each other's problems, reinforcing the concept of writing equations for word problems.*	

Additional Resources and Materials

Spinner wheel, bingo cards, ten patterns, local fruits, ludo sheet, playing cards, dice, number lines, number cards, balance scales, addition and subtraction wheel

Additional Useful Content Knowledge for the Teacher

The preservation of equality in addition and subtraction using simple, open sentences is a fundamental concept in mathematics, particularly in algebra. It refers to the principle that when you perform the same operation (either addition or subtraction) on both sides of an equation, the equation remains balanced and true.

An open sentence is a mathematical statement containing an unknown value, e.g. 3 + x = 7
Closed sentence is a mathematical sentence where all the values are known, e.g. 3+4 =7
Equality means that both sides of the equation have the same value, e.g. 7+8 =15 0R 7+8 = 10+5

A variable is a mathematical symbol that can represent an unknown value.

Preservation of Equality: When you have an equation with an open sentence and perform the same operation (either addition or subtraction) on both sides of the equation, you ensure that the equation remains true. Here's how it works:

Addition: The equality is preserved if you add the same number to both sides of an equation. For example:
If you have "x + 4 = 9," you can add 4 to both sides to get "x + 4 + 4 = 9 + 4," which simplifies to "x + 8 = 13."

Subtraction: Similarly, the equality is preserved if you subtract the same number from both sides of an equation. For example:
If you have "x + 8 = 13," you can subtract 8 from both sides to get "x + 8 - 8 = 13 - 8," which simplifies to "x = 5."

The open sentence remains true in both cases because the operation was performed equally on both sides of the equation. This concept is crucial in algebra and problem-solving, as it allows you to find the value of the variable (in this case, "x") by isolating it on one side of the equation while keeping the equation balanced and accurate.

Opportunities for Subject Integration:

Language Activities:

Creation of riddles / sentences with singular and plural of nouns to show understanding of addition and subtraction.
For example, If Tommy has five red cars, Micah has six, and Noah has fifteen.
How many cars do Tommy and Micah need to get to have the same number of cars as Noah?

Presentations: Students show two boxes with the same number of objects in each box and discuss how they are equal.

Math Storytelling:

Students create short stories incorporating math problems involving addition and subtraction. They write open sentences to represent the problems and explain the steps to preserve equality.

Students maintain math journals where they write about real-life situations involving addition and subtraction. They use open sentences to represent the problems and explain their solutions in writing.

Strategies that Support the Curriculum and Assessment Framework

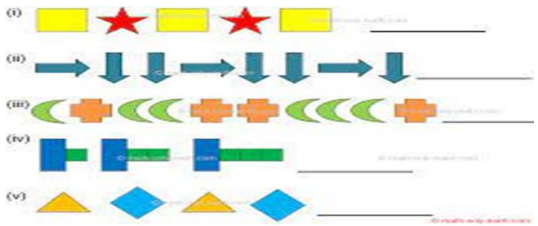
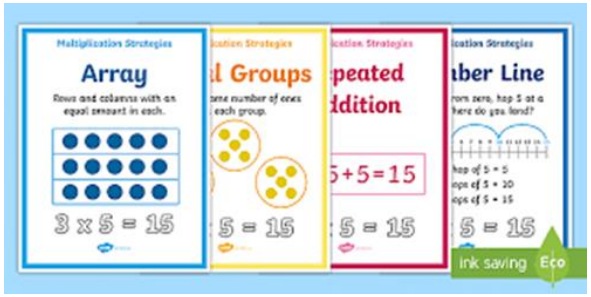
Elements that are integrated across subjects:
Literacy: Creation of word problems, reading and understanding story problems
Civics:
Science

Elements from Local Culture, Technology, TVET, and Environment that are integrated:
Local fruits and materials
Games
Caribbean folktales

Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

Introduction to the Subject:
Strand (Topic): Pattern and Relationships
Essential Learning Outcomes: P3.1 ***Modelling Quantitative Relationships and Analyzing Change – Modelling Patterns and Relationships with Equations and Functions***
Grade Level Expectations and/or Focus Questions: Use models to represent and solve problems (tallies, drawings, concrete materials, etc.); model problem situations with objects and use representations such as graphs, tables, and equations to draw a conclusion.

Specific Curriculum Outcomes	**Inclusive Assessment Strategies**	**Inclusive Learning Strategies**
<u>Knowledge</u> **<u>Skills</u>** **<u>Values</u>** 1. Identify the relationship/pattern by using different representations (tables graphs, and simple equations)	**SCO 1** **Story Problems:** Present real-life scenarios in the form of story problems that require students to identify relationships and patterns. **Toy Sharing Story:** **Scenario:** Three friends, Amy, Ben, and Chloe, have a collection of 15 toys. They want to share the toys equally among themselves. How many toys will each friend get, and are there any toys left over?	**SCO 1** **Visual Aids**: **Drawings:** Encourage students to draw pictures or diagrams to help them visualize and solve problems given patterns and relationships.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
2. Recognize and describe patterns in number sequences and tables 3. Identify the relationship between input and output values. 4. Determine the function between the input and output 5. Explain how the input and output values are related in simple functions, using appropriate language (e.g., "When the input increases by 2, the output also increases by 2") 7. Identify and explain changes in number patterns, recognizing the different operations involved in the relationship (additions, subtractions, or multiplications)	**SCO2** **Pattern Puzzles:** Create pattern puzzles where students must match a sequence of numbers or symbols to a given pattern. This adds a problem-solving element to the assessment.  https://www.math-only-math.com/3rd-grade-patterns.html **SCO 3,4,5** **Visual Representations:** Create visual representations like tables or charts to illustrate the relationship between input and output values. Visual learners can benefit from seeing the patterns and connections. **Observational Checklist**: Integrate the checklist into classroom activities that involve working with numbers.	 https://www.twinkl.com/resource/us2-m-363-multiplication-strategies-display-posters ***SCO2*** ***Collaborative Learning:*** Foster collaborative learning environments where students work together to identify and describe patterns. This allows for peer support and the sharing of different perspectives.  https://www.pinterest.com/pin/392798398733593456/ **SCO3, 4, 5**

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr>
<td></td>
<td>
Place a tick by the appropriate response.
<table>
<tr><th>ITEMS</th><th>YES</th><th>NO</th></tr>
<tr><td>Can the student explain the relationship between input and output clearly and concisely, using appropriate terminology?</td><td></td><td></td></tr>
<tr><td>Can the student identify the numbers that represent the output?</td><td></td><td></td></tr>
<tr><td>What strategy does the student use to identify the relationship between the numbers?</td><td></td><td></td></tr>
<tr><td>Can the student identify patterns in input-output tables or sequences?</td><td></td><td></td></tr>
<tr><td>Can the student predict the output for a given input using the provided equation or pattern?</td><td></td><td></td></tr>
<tr><td>Can the student explain the relationship between input and output clearly and concisely, using appropriate terminology?</td><td></td><td></td></tr>
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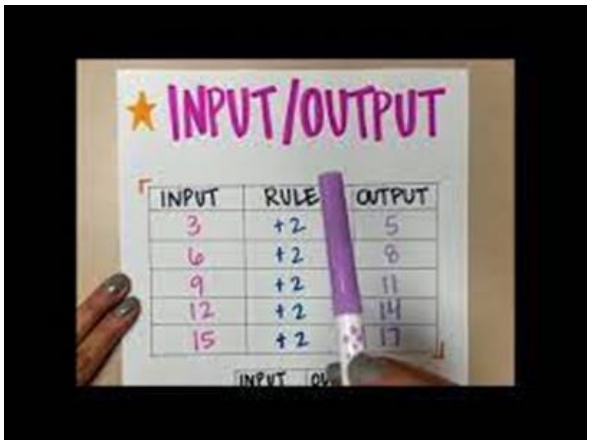


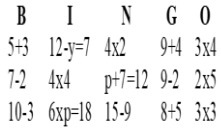
https://www.youtube.com/watch?app=desktop&v=1486kIXmoU8

Tables: *Teach students to organize data in tables. If you're working on a word problem that involves keeping track of time or quantities, create a table to help them see the information clearly.*

For example, *if they are tracking the number of books read in a week, they can use a table with days of the week in one column and the number of books read in another column.*

SCO 6
</td>
</tr>
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	<table><tr><td>Can the student use visual aids or diagrams to illustrate the input-output relationship effectively?</td><td></td><td></td></tr><tr><td>Can the student adapt their understanding to different types of input-output problems?</td><td></td><td></td></tr></table> **SCO 6** **Journal** Students make entries about their methods to identify the pattern or relationship. Also, they can include generalizations formulated and equations as well as the strategies they use to ensure that the function is correct. Further, they can indicate their feelings about the mathematics they are learning and their preferred methods. **Interactive Games:** educational games that involve identifying changes in number patterns to understand how additions, subtractions, or multiplications affect number patterns. **Number Pattern Bingo** Create bingo cards with number patterns on them.	**Real-World Context** Connect the use of models to real-world situations. *For example, the number of sweets in a jar change as it is eaten or how a plant grows taller each day.* Engage students in hands-on activities that involve change. *Measure the height of a plant each day and record the data using a table.* This can be a fun way to introduce the concept of functions and how one variable changes with another. **Concrete Materials:** Use physical objects like counters, cubes, or coins to model problems. If you have a problem with addition, give students physical objects to represent the numbers and then physically combine them. *For example,* if they need to add 3 and 4, they can use three counters and four counters, physically combine them, and count the total.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Call out equations that represent additions, subtractions, or multiplications. Students mark the corresponding numbers on their bingo cards.  B I N G O 5+3 12-y=7 4x2 9+4 3x4 7-2 4x4 p+7=12 9-2 2x5 10-3 6xp=18 15-9 8+5 3x3 **Math Bingo:** Create bingo cards with equations instead of numbers. Call out the result, and students mark the correct equation on their cards.	Utilize concrete objects like blocks, coins, or counters to model different situations. This helps students visualize and understand the concept of change. *Use blocks to represent the growth of a plant over several days.* Equations: Introduce simple equations to represent mathematical relationships. *For instance,* if you have a problem where students need to find the total cost of buying 5 candies at $1 each, they can write the equation: Total Cost = 5 x 1. **Interactive Apps and Games** Students can be engaged in online games involving functions. https://www.mathplayground.com/functionmachine.html https://www.mathgames.com/skill/3.31-increasing-addition-patterns https://www.mathgames.com/skill/3.57-multiplication-input-output-tables-find-the-rule

Additional Resources and Materials

(Additional material and resources that are not included in the Inclusive Learning and/or Inclusive Assessment Strategies that may be useful for lesson planning)
Understand basic arithmetic operations such as addition, subtraction, multiplication, and division.

Additional Useful Content Knowledge for the Teacher:

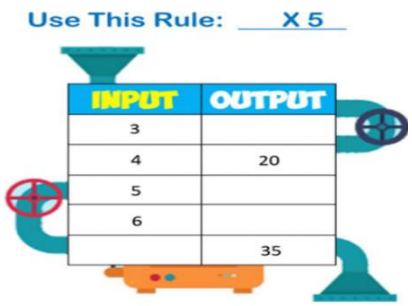
EQUATION: a mathematical statement that shows the equality of two expressions.

An EQUATION typically consists of two sides separated by an equal sign (=). The expressions on the left and right sides of the equal sign are called the left-hand side (LHS) and right-hand side (RHS) of the equation, respectively.
EXAMPLE: 5 + ___ =8
(e.g. 3 + ___ = 8) and express them in mathematical notation.

Function: A function relates an input to an output. It shows the relationship between two numbers.
A function is defined as a relation between a set of inputs having one output each.

- Function: "Double the Number"
  - Rule: Multiply the input number by 2.
  - Example: If the input is 3, the output is
  - 2×3=6
  - 2×3=6.
- Function: "Add 5"
  - Rule: Add 5 to the input number.
  - Example: If the input is 7, the output is
  - 7+5=12
  - 7+5=12.

Example:



https://mathstory.com/input-output-machine-3rd-grade-3/

Opportunities for Subject Integration: *(Additional ideas about how the inclusive learning strategies might be adapted and/or applied to include other subjects in the curriculum)*

Science:
Study the growth patterns of plants (height vs. time) or populations of animals (population size vs. years) in a science class. Collect data, create graphs, and analyze the patterns. Translate the patterns into equations or functions. Discuss the relationship between the scientific observations and the mathematical representations.

Use a thermometer to measure the temperature.

Technology: Interactive Simulation
Utilize interactive simulations or educational apps that allow students to create and manipulate mathematical patterns. Students explore the patterns, modify variables, and observe the changes in real time.

Music: Exploring Rhythmic Patterns
Activity: Analyze rhythmic patterns in music, including beats, tempo changes, and time signatures. Students identify and represent mathematical patterns in musical compositions using equations or functions. They create their own musical patterns and translate them into mathematical expressions.

Social Studies:
Record and create a table to show the number of members for each group in the school.
Identify a pattern.
Identify relationships created

Language

Students will effectively communicate their predictions based on identified relationships, using appropriate language and supporting their assertions with evidence from patterns.

Students will explain their reasoning when making predictions or generalizations in patterns, demonstrating a clear understanding of their identified relationships.

Strategies that Support the Curriculum and Assessment Framework

This section is optional and intended to assist writers as they check the curriculum to the Curriculum and Assessment Framework. It can be used at the discretion of the Team Leads and PICT Subject Specialists. It will be used to guide the writing but will not appear in the curriculum guides.

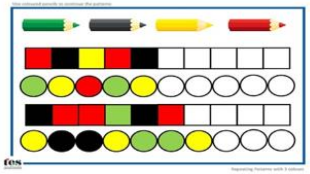
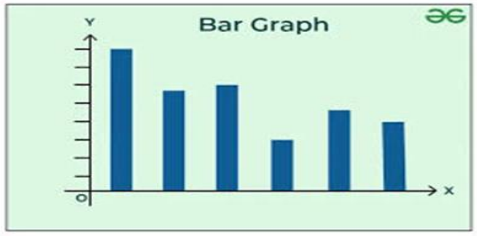
Elements that are integrated across subjects:

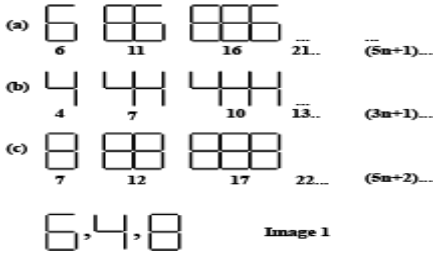
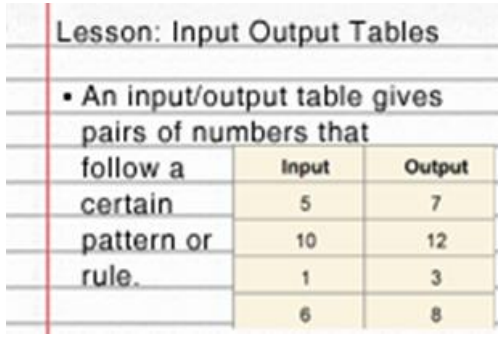
Elements from Local Culture, Technology, TVET, and Environment that are integrated:

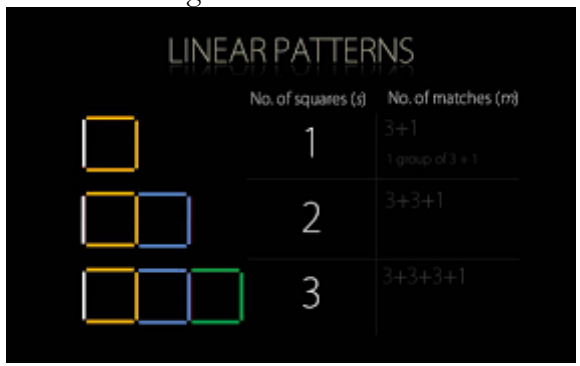
Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

Introduction to the Subject:
Strand (Topic): Pattern and Relationships
Essential Learning Outcomes:P***3.2: Modelling Quantitative Relationships and Analyzing Change – Representing Functions and Relationships***
Grade Level Expectations and/or Focus Questions: Can look for and apply relationships between varying quantities to make predictions; make and explain generalizations in patterns.

Specific Curriculum Outcomes	**Inclusive Assessment Strategies**	**Inclusive Learning Strategies**
<u>Knowledge</u> 1. Identify relationships to make accurate predictions about future data points or outcomes, 2. Use patterns and trends to identify relationships 3. Make predictions based on identified relationships 4. using appropriate language and supporting assertions with evidence from patterns. 5. Explain reasoning when making predictions or generalizations in patterns, 6. Justify the relationships identified. **<u>Values</u>** 7. Collaborate in analyzing data sets and identifying relationships,	**SCO 1** **Predictive Games:** Create games that involve predicting outcomes based on patterns. For example, a game where students predict the next number in a sequence or the colour of the next item in a pattern. **Number Sequences:** If a player draws a number card, they must look at the sequence on the card (e.g., 2, 4, 6, __) and predict the following number. Players move their game piece forward the number of spaces they predicted. **Colour Patterns:** If a player draws a colour card, they must examine the colour pattern on the card (e.g., red, blue, red, __) and predict the colour of the next item. Players	**SCO 1** **Story-Based Prediction Activity**: Develop a story that involves patterns or trends. Ask students to identify the relationships within the story and make predictions about future events. For example: **Title: The Friendly Forest Parade**

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
8. Discuss patterns and predictions as a group and share insights and interpretations. **Skills** 9. Create tables, listing input and output pairs for simple functions (e.g., 2 times the input number). 10. Students will represent relationships such as addition or subtraction pattern.	move their game piece forward to the next space with the predicted colour. **SCO 2, 3 and 4** Structured Sentence Starters: Offer structured sentence starters or sentence frames that guide students in expressing their predictions**. For example**, "I predict that the next number/colour will be ___ because ___." This provides support for students in organizing their thoughts and expressing predictions verbally or in writing.  http://maxwellsmunchkinsattes.weebly.com/patterns.html  https://www.geeksforgeeks.org/bar-graph-meaning-types-and-examples/ **SCO5** **Problem-solving and rule generation**	 In the heart of Whispering Woods, a magical forest housed animals of all sizes living harmoniously. Annually, they organized the Friendly Forest Parade, led by the Grand Gecko, with a captivating colour-changing pattern—green, blue, and red. Animal friends Rosie, Timmy, and Oliver cracked the code, predicting and celebrating the Grand Gecko's colours. Inspired, they explored patterns of other forest creatures, turning the Friendly Forest Parade into a magical adventure in Whispering Woods. **SCO 2,3 and 4** **Role-Playing Scenarios:** Develop role-playing scenarios where students assume different roles and predict outcomes based on patterns. This adds a creative and interactive element to learning and provides a platform for expressing predictions.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Find the rule and complete the table. | In	Out
---	---
9	5
19	15
	29
62	
95	91
96	92 | https://www.ixl.com/math/grade-4/input-output-tables-with-addition-subtraction-multiplication-and-division **Real-World Application Project:** Identify a function and create a table of input and output pairs. For example, explore doubling the ingredients in a recipe. **SCO 6** **Pattern Representation**  Image 1 https://www.toppr.com/ask/question/observe-the-patterns-of-digits-made-from-line-segments-of/	Students can apply their understanding of patterns and relationships to real-world scenarios, such as predicting trends in sales, analyzing weather patterns, understanding population growth, and making connections between classroom learning and everyday situations. **SCO 5** **Visual Aids:** Visual aids like drawings, charts, graphs, and manipulatives can make abstract concepts more concrete. For representing functions and relationships, you can use bar models, number lines, and simple graphs to illustrate the connections between different variables.  https://www.turtlediary.com/lesson/input-output-tables.html **SCO6** **Manipulatives:** Provide students with hands-on manipulatives such as counters, blocks, or shapes to explore and create their own functions and relationships. This

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		can help kinesthetic learners and students with diverse learning needs.  https://the-world-is-my-classroom.weebly.com/unit-14-relationships-in-patterns.html **Technology:** Utilize educational technology, such as interactive math software or apps, to engage students and provide additional support. https://www.mathgames.com/skill/3.31-increasing-addition-patterns https://www.mathgames.com/skill/3.60-select-the-rule-with-input-output-tables **Interactive Apps and Games** Students can be engaged in online games involving functions. https://www.mathplayground.com/functionmachine.html

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		https://www.mathgames.com/skill/3.31-increasing-addition-patterns https://www.mathgames.com/skill/3.57-multiplication-input-output-tables-find-the-rule

Additional Resources and Materials:

IN	OUT
3	
4	
6	

RULE: Add 3

Create a rule for the function below:

IN	OUT
10	7
8	5
7	4
6	

RULE:

Complete the sequence: 3, 7, 11, ____, _____
Find the pattern rule in the sequence above.

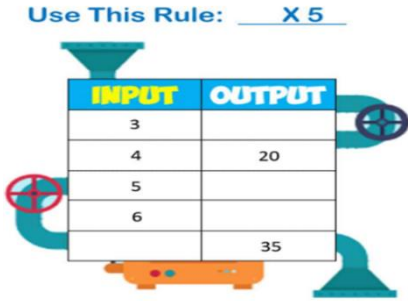
Create a pattern containing five (5) numbers that begin with an odd number.

Additional Useful Content Knowledge for the Teacher: (*any additional knowledge that the writers believe would be helpful for the teacher, such as reading material at a lower or higher grade level, links to curriculum documents for other grades)*

EQUATION: a mathematical statement that shows the equality of two expressions.

An EQUATION typically consists of two sides separated by an equal sign (=). The expressions on the left and right sides of the equal sign are called the left-hand side (LHS) and right-hand side (RHS) of the equation, respectively.
EXAMPLE: 5 + ___ =8
(e.g. 3 + ___ = 8) and express them in mathematical notation.

Example:



https://mathstory.com/input-output-machine-3rd-grade-3/

Opportunities for Subject Integration: ***(Additional ideas about how the inclusive learning strategies might be adapted and/or applied to include other subjects in the curriculum)***

Science:
Study the growth patterns of plants (height vs. time) or populations of animals (population size vs. years) in a science class. Collect data, create graphs, and analyze the patterns. Translate the patterns into equations or functions. Discuss the relationship between the scientific observations and the mathematical representations and develop generalizations.

- Study an anemometer and thermometer, identify a pattern between the two readings, analyze data and represent data on a bar graph.

Literacy:
- Use a diary/journal to write about feelings and experiences while looking for and applying relationships between varying quantities to make predictions; make and explain generalizations in patterns
- Explain their own ideas and understanding in light of the discussion. Share ideas relevant to class activities and discussions.
- Use stated and implied information and ideas in texts to make simple inferences and reasonable predictions about them.
- Explain meanings conveyed by charts and graphs.

Social Studies:
- Record and create a table to show the number of members for each group in the school.
- Identify a pattern.
- Identify relationships created.
- Construct a generalization.

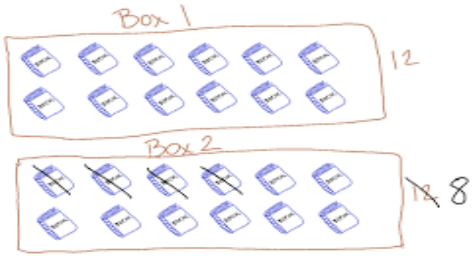
Strategies that Support the Curriculum and Assessment Framework

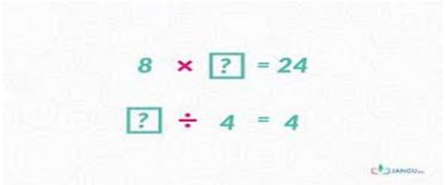
Elements that are integrated across subjects:

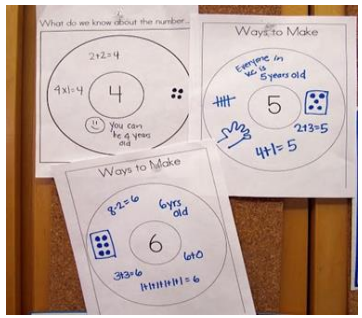
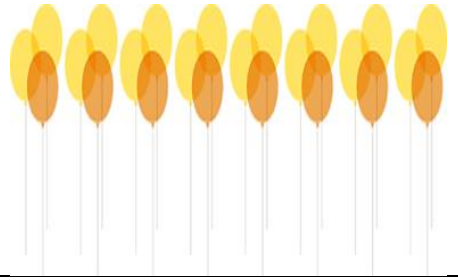
Elements from Local Culture, Technology, TVET, and Environment that are integrated:
Local fruits and materials: Marbles, beads, tamarind seeds, plants.

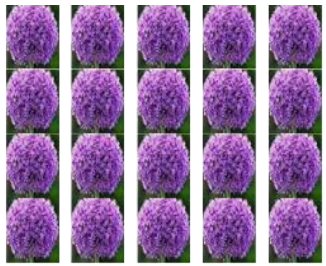
Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

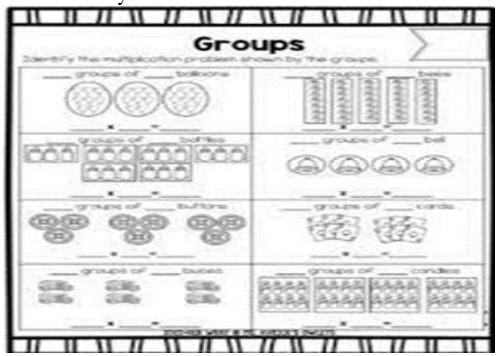
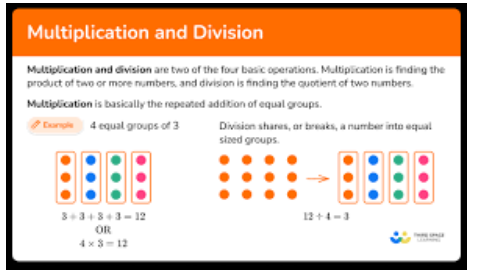
Introduction to the Subject: *Identifies the purpose and goals of the subject area with links to the Vision and the Essential Education Competencies.*
Strand (Topic): *Identify a Strand which may have a sub-component that will be reflected in the Specific Curriculum Outcomes.*
Essential Learning Outcomes: *P3.3: Modelling Quantitative Relationships and Analyzing Change – Solving Problems with Functions and Relationships*
Grade Level Expectations and/or Focus Questions: *Create and solve story problems involving simple functions and relationships in open sentences*

Specific Curriculum Outcomes	**Inclusive Assessment Strategies**	**Inclusive Learning Strategies**
<u>Knowledge</u> **<u>Skills</u>** **<u>Values</u>** 1. Describe simple mathematical functions, such as addition, subtraction, multiplication, and division. 2. Write open sentences (equations or expressions with blanks) to represent mathematical relationships in real-world situations. 3. Solve open sentences to find the missing values or variables using appropriate operations and strategies.	**SCO1** **Story-Based Problems** Present mathematical functions in the context of real-life scenarios or stories. Craft word problems that involve addition, subtraction, multiplication, or division, allowing students to apply mathematical functions in meaningful contexts. Addition: Sarah is baking cookies. She already has 5 chocolate chips on one tray and 3 on another. How many chocolate chips does she have in total? Mathematical Function: 5+3=?	**SCO 1** **Visual Aids and Graphics to create story problems:** Use visual aids like charts, diagrams, or drawings to represent mathematical functions visually. 

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
4. Translate verbal descriptions of real-life scenarios into open sentences, focusing on identifying key information and variables. 5. Create story or word problems involving simple functions and relationships represented by open sentences. 6. Apply addition and subtraction operations to situations involving combining or taking away quantities, such as money, objects, or time. 7. Apply multiplication and division operations to situations involving equal groups, sharing, or repeated addition. 8. Check and validate solutions to story problems by using inverse operations or estimating to see if the answer makes sense in the context of the problem.	Subtraction: Johnny had 8 marbles, but he lost 3 of them while playing. How many marbles does Johnny have now? Mathematical Function: 8−3=? Multiplication: Emma has 4 boxes, and each box has 6 chocolates. How many chocolates does she have in total? Mathematical Function: 4×6=? Division: There are 15 candies, and Lily wants to share them equally among her 3 friends. How many candies will each friend get? Mathematical Function: 15÷3=? **SCO2 and 3** **Role-Playing Scenarios:** Introduce role-playing scenarios where students can act out real-world situations. Afterward, they can create open sentences to represent the mathematical relationships involved (addition, subtraction, multiplication, division). *e.g. Students act as gardeners planting rows of flowers. Each row contains a certain number of flowers. Open Sentence: Total number of flowers=_____×_____*	 *https://www.weareteachers.com/word-problems-with-pictures/* **SCO2 and 3** Role-Playing and Simulations: Engage students in role-playing activities where they act out real-world situations. After the role-play, prompt them to create open sentences based on the mathematical relationships they encountered during the simulation. *Cooking Challenge: Students participate in a cooking challenge where they must double or triple a recipe based on the number of people they serve.* Open Sentence: Total servings=_____×_____  *https://www.youtube.com/watch?app=desktop&v=0e4GC2qMnJk*

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 Let Total number of rows = 3 And Total number of columns = 3 https://www.teachoo.com/8483/2101/Ex-6.4--8/category/Ex-6.4/ **SCO4** ***Visual Organizers*** Provide visual organizers or graphic organizers: students structure the information from verbal descriptions. Planting Flowers in a Garden ***Verbal Description*** In the garden, there are 4 rows of flowers, and each row has 5 flowers. Sarah wants to find out how many flowers there are in total. Open Sentence Using Visual Organizer: Total number of flowers = 4 × 5 or 4+4+4+4+4	**SCO4**  https://www.weareteachers.com/graphic-organizers/ **SCO5** Scenario: Distributing Candies *Problem: Alex has 24 balloons, and he wants to distribute them equally among 8 friends. How many balloons will each friend get? Open Sentence: Each friend gets:24÷8=3* 

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Visual Organizer:  ***SCO5*** **Real-life Scenario:** Using real-life scenarios ensures that the problems posed are relevant to students' experiences and interests. This relevance fosters engagement and makes the learning experience more relatable. For example ***haring Stickers*** Problem: Sarah has 15 stickers, and she wants to share them equally with her 5 friends. How many stickers will each friend get?	*http://asmsi.org.au/teacher_modules/multiplication_and_division.html* **SCO6** **Games** *Math Relay Race:* Organize relay races where teams solve addition and subtraction problems at each station before passing the baton to the next teammate. The team that completes the race first wins. *Shopping Spree:* Role-play a shopping scenario where students "buy" items with play money. They practice adding the cost of items and subtracting the amount they've spent from a set budget. **SCO 7** **Multiplication and Division Arrays:** Introduce the concept of arrays for multiplication and division. Have students create arrays with objects or draw them on paper to visualize equal groups and repeated addition.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	SCO 6 Assessment through Games: Incorporate educational games that involve addition and subtraction. Games make learning enjoyable, and they provide an opportunity for continuous evaluation as students engage in the activities. For example: Math Puzzles: Create jigsaw puzzles with math problems on one piece and the answer on another. Students must match the problem with the correct answer to complete the puzzle. **SCO 7** Multiplication/Division Models: Ask students to create visual models to represent multiplication and division problems. This could include arrays, equal grouping diagrams, or number lines. Visual representations help students grasp the concepts concretely.  *https://www.teacherspayteachers.com/Product/Multiplication-Equal-Groups-Arrays-and-Number-Lines-7694421*	 *https://thirdspacelearning.com/us/math-resources/topic-guides/number-and-quantity/multiplication-and-division/* **SCO 8** **Think-Pair-Share:** Implement the "Think-Pair-Share" strategy where students first individually consider the reasonableness of their solutions, then discuss their thoughts with a partner, and finally share their findings with the whole class. For example **Think (Individual Consideration):** Each student thinks independently about the problem and solves it using addition to find the answer. For this problem, they would add 15 (initial candies) and subtract 7 (candies given away). Student's Thought Process: "I have to add 15 candies and then subtract 7 because Sarah gave some away. So, I think the answer is 15 + 7 = 22 candies."

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	SCO 8 **Inverse Operation Checks:** *Present story problems that require either addition and subtraction or multiplication and division. After solving the problem, ask students to use the inverse operation to check their solution. For example, if they added to find the solution, they should subtract to verify, and vice versa.* **Addition and Subtraction Story Problems:** Problem: Sarah has 15 apples. She gave 7 apples to her friend. How many apples does she have now? Inverse Operation Check: After adding to find the solution, students should subtract to verify. Problem: There are 24 students in a class. If 9 students are absent today, how many students are present? Inverse Operation Check: After subtracting to find the solution, students should add to verify. **Multiplication and Division Story Problems:** Problem: There are 4 shelves, and each shelf has 8 books. How many books are there in total on all the shelves?	**Pair (Discuss with a Partner):** Students pair up with a partner to share their individual solutions. They explain their reasoning to each other, discuss the steps they took, and compare answers. Peer Discussion: "I added 15 and then subtracted 7 to get 22. Did you get the same answer? How did you solve it?" **Share (Whole Class Discussion):** After discussing with their partners, students participate in a whole-class discussion. Some pairs share their solutions, and the teacher facilitates a discussion by asking questions like, "How did you arrive at your answer?" or "Does the solution make sense in the context of the problem?" **Class Discussion:** "Let's hear from a few pairs. How did you solve the problem, and does your answer make sense? Why or why not?"

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Inverse Operation Check: After multiplying to find the solution, students should divide to verify. Problem: Julia has 20 stickers, and she wants to share them equally among 5 friends. How many stickers will each friend get? Inverse Operation Check: After dividing to find the solution, students should multiply to verify.	

Additional Resources and Materials

(Additional material and resources that are not included in the Inclusive Learning and/or Inclusive Assessment Strategies that may be useful for lesson planning)

Additional Useful Content Knowledge for the Teacher: (*any additional knowledge that the writers believe would be helpful for the teacher, such as reading material at a lower or higher grade level, links to curriculum documents for other grades)*

Opportunities for Subject Integration: *(Additional ideas about how the inclusive learning strategies might be adapted and/or applied to include other subjects in the curriculum)*

Strategies that Support the Curriculum and Assessment Framework

This section is optional and intended to assist writers as they check the curriculum to the Curriculum and Assessment Framework. It can be used at the discretion of the Team Leads and PICT Subject Specialists. It will be used to guide the writing but will not appear in the curriculum guides.

Elements that are integrated across subjects:

Elements from Local Culture, Technology, TVET, and Environment that are integrated:

Items of Inspiration (teaching tips, inspirational passages, connections to educational research):