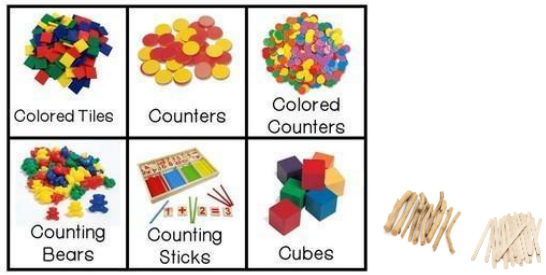
May 2023

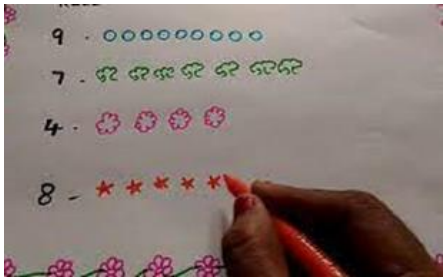
Organisation of
Eastern Caribbean States

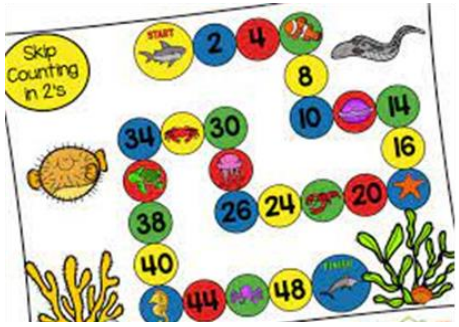
OHPC Grade Mathematics Curriculum

Number Sense

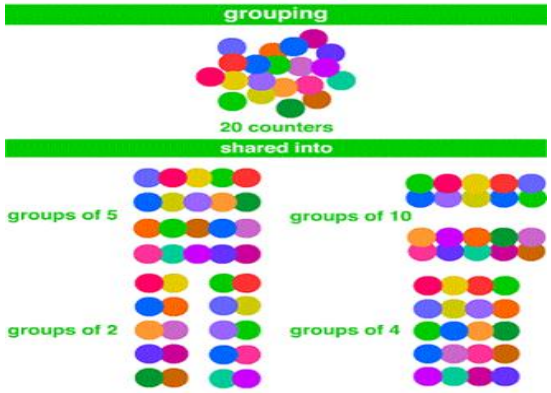
Introduction to the Subject: *Whole numbers are numbers exclusive of any fractions, negatives or decimals. Whole numbers can be created from a combination of basic numbers and zero (basic numbers are 1,2,3,4,5,6,7,8,9). The need for students to be able to use counting and grouping strategies is important as it helps to develop confidence in students and encourages the flexible thinking needed for comprehending and creating relationships between numerals and quantities.*
Strand (Topic): Number Sense
Essential Learning Outcomes: 1.1: *Using whole numbers - learners will meaningfully sequence and use a range of counting and grouping strategies.*
Grade One Level Expectations: *Whole numbers up to 20 with exploration to 100*

Specific Curriculum Outcomes	**Inclusive Assessment Strategies:**	**Inclusive Learning Strategies:**
Learners will be expected to: • Count with meaning to 20 by building quantities; and matching quantity with numeral. • Orally sequence numbers to 100 by 1s, 2s, 5s and 10s. • Count backwards from 20 by 1s, 2s, 5s and 10s. • Count backwards from 100 by 5s and 10s.	**Observation** • *Concrete:* Check to see whether learners can use manipulatives to count and build quantities up to 20. • *Pictorial:* Observe learners as they match pictorial representation of quantities with the correct number up to 20. • *Symbolic:* Listen to learners as they call out numerals based on a representation shown of a particular quantity up to 20. Observe learners write the numeral in figures and words after being shown a	Students should begin counting initially from 1-20 and engage in one-to-one counting using manipulatives. Give students opportunities to represent any single number from 1-20 using concrete manipulatives (coloured tiles, counters, counting sticks, cubes, marbles, toothpicks, buttons, corks, square tiles etc.) to count and build quantities to 20 and by pictorial representation. For example, have students fill small containers with a specified number of objects.  Use stories to enable students to demonstrate spatial comparison using ordinals. e.g. Which boy came first in the race?

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• Identify error/s in a counting sequence up to 20. • Use Number lines (vertical and horizontal) and number charts to support counting and skip counting. • Counts by 2s, and 5 to find a total in multiplicative contexts (repetitive addition). • Quantify sets up to 20 and state that the last number said is the amount counted. • Identify numeral for quantities and vice versa.	representation of a particular quantity up to 20. **Think, pair, share** • Have learners select a card of their choice then pair with each other to match the symbolic representation of the quantity shown on their card. **Observation** • Allow learners to draw quantities to represent a given amount up to 20. • Listen to learners as they count in sequence to 100. **Talking circles** • Learners form a circle and take turns to skip count. Allow learners to come up with their own sequence up to 20 and explain to the class how they formed that sequence. • Allow learners to use manipulatives, interactive games and number lines to identify errors in a counting sequence up to 20.	Give students opportunities to build numbers using blocks through play. For example, identify and say the number name that is presented to them.  • Identify the learner who has the identical quantity in relation to their number then pair up and present their findings to the class. • Draw the given quantity to the given number.  • Counting to 100 https://www.youtube.com/watch?app=desktop&v=JxaXmTokjqI Play games to enable students to count backwards and forwards e.g. Snake and the Ladder.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	• *Pictorial:* Check as learners use vertical and horizontal number lines to count forward to 100 by 1s, 2s, 5s and 10s and forward and backwards from 20 by 1s, 2s, 5s and 10. **Product-Group work** • In groups, allow learners to form sets of 2s and 5s with objects given (up to 20). Learners will then count the number of groups made in each case. **Product-Exit ticket** • Ask learners to draw a picture showing the number of cupcakes in 4 packages if there are three cupcakes in each package. • Using given sets of manipulatives, allow learners to count and state the final number for each set. • Using manipulatives, allow learners to form sets up to 20 and match numerals for each set.	• Allow students to sing and dance along to a song that counts to 100. https://youtu.be/Rj95a48yn4Y • Teacher introduces Counting up to 20 and backwards with the aid of videos and sing along. https://youtu.be/By2hmo323xM Allow students to demonstrate skip counting by making jumps in 2's, 5's and 10's on a number line (starting at zero) as well as when playing games like hopscotch. • Skip count numbers using a number chart and other interactive games https://youtu.be/Eer3bFhN5HA   • Use manipulatives and number lines to identify and correct errors on number strips.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	• As groups, learners fish for numerals up to 20 and draw quantities to represent the numeral. Are students able to recite number sequences beginning with 1, 2, 3, 4, 5, 6, 7… etc.? Are students able to count using one to one correspondence? Can students identify the number that comes after or before a number from 1-20? Are students able to skip count in 2's, 5's and 10's on a number line? Can students recognize 0 as the absence of items in a set? As a starting point for counting on the number line?	 • Circle the number that is in the wrong place in each row. a) 5, 6, 7, 8, 4 b) 1, 5, 2, 3, 4 c) 11, 12, 13, 15, 14, 16, 17 d) 10, 9, 8, 7, 6, 4, 5, 3 e) 20, 19, 18, 16, 17, 15 Allow students to participate in activities that demonstrate the 'zero' concept. e.g. Have 8 to 10 containers placed in a straight line with marbles in a few of the containers. Allow pupils to choose the container without any marble. 

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		• Use manipulatives in sets of 20's to formulate groups of 2's, 5's and10's  • Fish a number from a bag and draw the quantity (vice versa) 

Useful Content Knowledge for the Teacher about the Outcome: Quantifying is counting or expressing something in numbers. A numeral is a symbol or name that stands for a number.
When children are able to count, they can then begin to build meaning around counting. This involves an understanding of the following principles:
1. One number is said for each item in the group and is counted once and only once. (one-to-one correspondence)
2. Counting begins with the number 1, and there is a set number sequence. (stable order)
3. The quantity in the set is the last number said. (cardinality)

4. The starting point and order of counting the objects do not affect the quantity. (order irrelevance)
5. The arrangement or types of objects does not affect the count. (Conservation)
6. It does not matter what is being counted, the resulting count will always be the same. (abstraction)

Learning to count involves associating a number with how many or with how much. Children must learn the first twelve numeral names while thirteen through nineteen follow a definite "teen" pattern. The pattern shifts again when working with numbers between twenty and ninety-nine. When students count beyond 20, they begin to see the regularity of the counting patterns, i.e. twenty-one, twenty-two, twenty-three…., thirty-one, thirty-two, and thirty-three… and so on. They can then see that the naming of numbers from 11–19, inclusive, does not follow the same regular pattern as the names of numbers between 21–99. Asking students to discuss patterns in counting and to reflect on how numbers are said, promotes the development of counting skills. The role of the teacher is to support students in developing an understanding of the meaning of counting.

Quantifying is counting or expressing something in numbers.

The multiplicative content of addition relates to being able to represent equal groups using a repeated addition expression and relate multiplication to repeated addition.

$5 + 5 + 5$ can be written as 3×5

Inclusive Resources and Materials from Regional Specialists - *texts, worksheets, videos, bricks, shells, stones, sticks, fruits, fingers*
Concrete materials such as Corks, buttons, square tiles, toothpicks, 10 frames, two-color counters, etc.
Games such as snake and the ladder, hopscotch etc.
Number lines

Additional Resources and Materials

Youtube videos
Site: liveworksheet.com

Opportunities for Subject Integration:

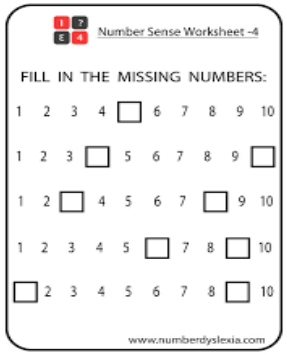
Science: Allow students to count. e.g Let them count the number of living things they observe in their environment.
Take them on nature walks, let them count the banana trees or other organisms seen by 2's,5's,10's.

Language Arts: Use of counting in Poetry

Social Studies: Allow learners to draw the people in their family and write the number of members next to their drawing.

Elements from Local Culture: *Use of seeds, stones, shells, bottle tops, fruits and sticks as manipulatives*

Resources for a learner who is struggling:



Youtube video: koohi kids (counting)

Resources for a learner who needs challenge:

b) Match

column A	column B
2+2+2	3x10
5+5+5+5	4x5
2+2+2+2+2	3x2
10+10+10	5x2
5+5	2x10
10+10	2x5

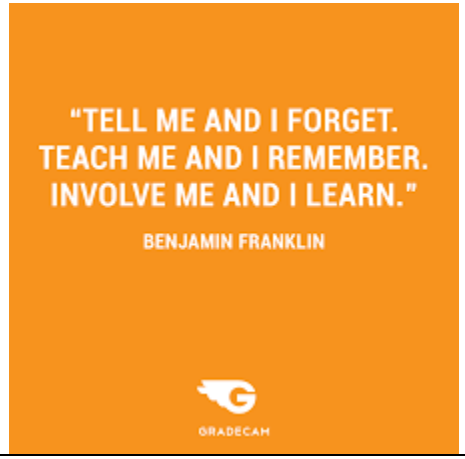
Strategies that Support the Curriculum and Assessment Framework

Elements that are integrated across subjects:
Science : grouping and numbering
number of males /females
Living and nonliving things
Different types of leaves

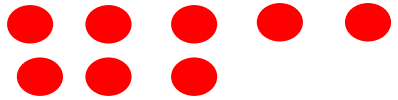
Elements from Local Culture, Technology, TVET, Environment that are integrated:

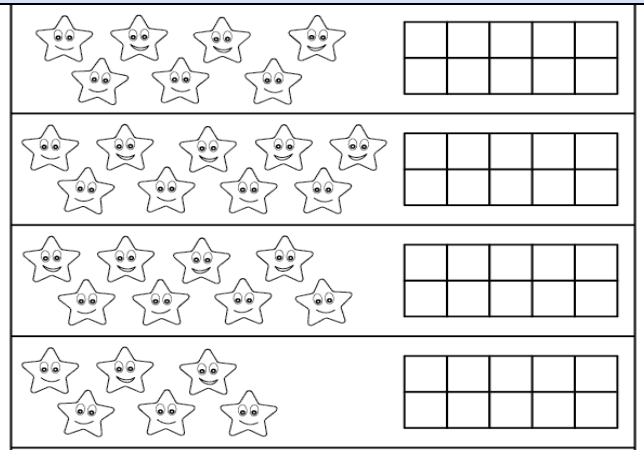
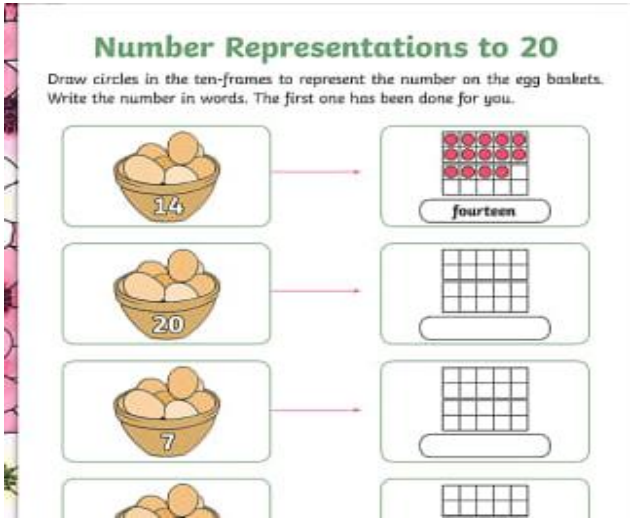
Counting charts, calendars, bottle caps, garden/plants

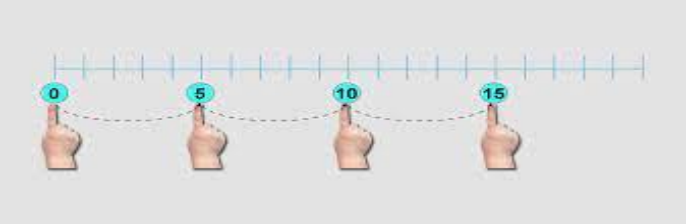
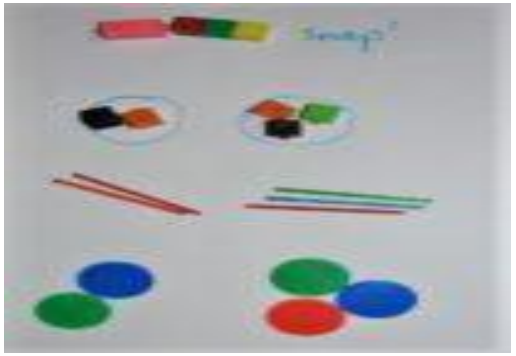
Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

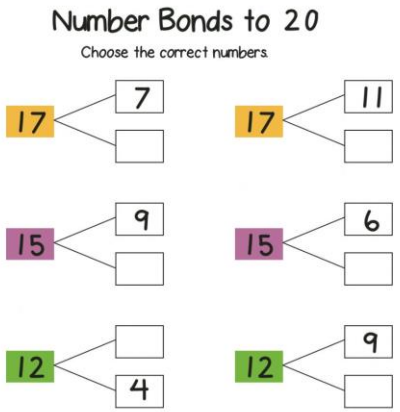
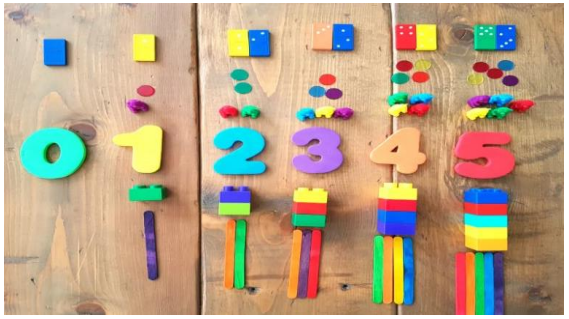


Introduction to the Subject: Number sense is the ability to manipulate numbers with great flexibility. It involves a student's ability to understand and represent quantities as well as, compare and order numbers. These skills are critical for the development of competency in Mathematics. This unit is organised to cater to the needs of all learners.
Strand (Topic): *Number Sense*- Representing and Partitioning Quantities to 20
Essential Learning Outcomes: 1.2 Learners will recognise, represent and partition whole numbers up to 20
Grade Level Expectations: Whole numbers up to 20

Specific Curriculum Outcomes:	**Inclusive Assessment Strategies:**	**Inclusive Learning Strategies:**
Learner will be expected to: • **represent a given number up to 20 using a variety of concrete models, including ten- frames and created materials.** • **Model a given number up to 20 using a variety of pictorial representation.** • **Find examples of a given number in the environment.** • **place given numerals on a number line (vertical and horizontal) with benchmarks 0, 5, 10, 15 and 20.**	**<u>Observation</u>** - **Concrete**: Observe learners as they work with concrete materials. Are they able to represent numbers accurately? - Check to see if learners are making use of resources correctly. • **Pictorial***:* Observe students as they make pictorial representation of numbers. Have them explain representations. **Count the stars, then colour the same amount in the ten frames.**	Students should begin with representing and partitioning quantities to 5, then 10, then 20. Using the 10-frame with two-color counters allows students to build and recognize relationships to 5, 10 and 20. For example, 8 is 2 less than 10.  Have students represent given numbers using bottle caps, counters, sticks, seashells, stones, marbles, dots, magnetic numbers, fingers, blocks or any available material in their environment.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **partition any given quantity up to 20 into two parts and identify the number of objects in each part.** • **model a given number using two different objects.** • **subitize for quantities 1-10.**	  Students will match the number card to the ten-frame representation.	 e.g. Give students multiple opportunities to make and break apart given quantities concretely and pictorially e.g. 2 mangoes and 3 bananas represent the quantity 5 as the total number of fruit.  Have students identify the number of objects when quantities are partitioned into two. Play the 'Number Hunt' game. In groups, students will be given numbers and allowed to find a group of objects in their environment that represent these numbers.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	<u>Product-Group Work</u> Observe as they find examples of given numbers in the environment. Guide students as they label number line or put the numbers in order on a chart. **Think Pair Share** Have students place numbers on a number line with benchmarks. Listen to them as they convince their partner that they have placed the numbers on the line correctly. 	Have students identify numbers on the number line to 20. E.g. Stand at specific points, hop to given numbers, etc. Students will play a number line game. They will order numbers on the number line. Teachers create a giant number line for the class, have students select a number and say where on the number line it should be placed. Let them explain why. **Partitioning number:** Students should have many opportunities to build quantities using a variety of materials and in a variety of contexts.  **"Snap" the blocks into parts:** This game is played individually. Variations include using counters, match sticks or beads.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 **Product- Exit Tickets** Have students use two different objects to create a model for a given number. (Have them create a poster using art material or something of that nature) Subitizing Rings and some wooden clothespins. Write the numerals on each end of the clothespins, and then encourage your students to match the numeral on the pin to the matching amount of dots on each of the Subitizing Rings.	To play: Form a given number of unifix blocks into a stick and "snap" it into two parts. Draw the parts. How many different combinations can you find? Give students the opportunity to model given numbers using pictorial representations. Students will match different objects representing a number e.g five stoppers - five pegs. Show quantities using different types of objects.  **Subitizing Rings (1-20)**

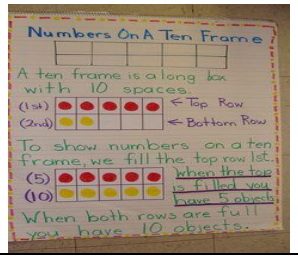
Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Challenge them by timing how fast they can match the pins to their correct spots on the ring.  	Provide students with the opportunity to recognize and name numbers in a group without counting.  Give students dice and pop-it. Ask students to roll the die and pop the corresponding number of buttons on pop - it.

Useful Content Knowledge for the Teacher about the Outcome:

Ten-Frames are two-by-five rectangular frames into which objects like counters can be placed to show numbers less than or equal to ten.

Ten Frames can be used to teach learners the relationship between the numerical number, the word number, and the visual representation of the number. See video 1 for guidance: https://youtu.be/wgXDksV0kyw

Subitise - being able to recognise at a glance familiar arrangement of dots or objects e.g dice patterns and ten frames.



Inclusive Resources and Materials from Regional Specialists - videos, varied manipulatives including the die, worksheets.

Additional Resources and Materials

How to make this counting board?

- Draw 5 ice cream cones on the cardboard. Write number 1 to 5 on the ice cream cones.
- Stick bottle caps (I used glue dots) above the ice cream cones, according to the numbers.

- Set out this counting board with 15 pompoms and invite your child to scoop and count.

- Math tips: What is subitizing?-https://youtu.be/j0ceWNFCuUQ

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

- ***Arts and Crafts*** *:*

Draw and colour shapes to show quantities.
Build teen numbers using ten frames, tallies, place value etc using flower craft activity.
Create a number chart using pictorial representation of numbers 1-20

- ***Language Arts:***

Make connections between numbers and everyday life
Recite Poem …
One, two buckle my shoe
3, 4 shut the door
5,6 Pick up six
7, 8 lay them straight
9,10 a big fat hen.

Dramatise stories, twenty little monkeys jumping on the bed, one fell down and bumped his head. Mother called the doctor and the doctor said, no more monkeys jumping on the bed.
Reading :

- The Icky Bug Counting Book by Jerry Pallotta
- 10 Little Rubber Ducks by Eric Carle
- Centipede's One Hundred Shoes by Tony Ross
- Fall Is Here! Counting 1-10 by Pamela Jane
- Five Little Monkeys Jumping on the Bed by Eileen Christelow
- Five Little Monkeys Sitting in a Tree by Eileen Christelow

- ***Social Science****:*

- Allow students to draw members of their family. In pairs allow students to write the numbers represented in each picture.
- Subitise for number of rooms in house, chairs at dining table

- **Science**:
  - Allow students to identify the number of senses, sense organs, and body parts e.g Ear: 2, Tongue - 1
  - Using numbers to represent number of organisms in a habitat

Elements from Local Culture:
Bottle caps, stones, sticks , doors, windows, desks, stairs, chairs, trees , light bulbs, baskets,

Resources for a learner who is struggling:

- **Allow students to build lego stacks by putting the pieces together in order written on blocks**
- **Allow students to build quantities using playdough**
- **https://www.twinkl.com/resource/roi-n-5189-count-and-colour-activity-sheet**
- **https://www.splashlearn.com/class/grade-2-jbps/grades/kindergarten/math_worksheet**

Resources for a learner who needs challenge:
https://themumeducates.com/wp-content/uploads/2022/05/Number-Bonds-to-10-Ten-Frame_TME.pdf

Activity sheets on Number Representation -https://themumeducates.com/wp-content/uploads/2018/03/I

Software: Prodigy Math; where learners can be challenged to represent quantities at various levels of difficulty

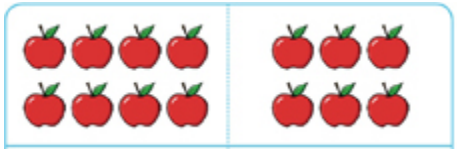
Strategies that Support the Curriculum and Assessment Framework

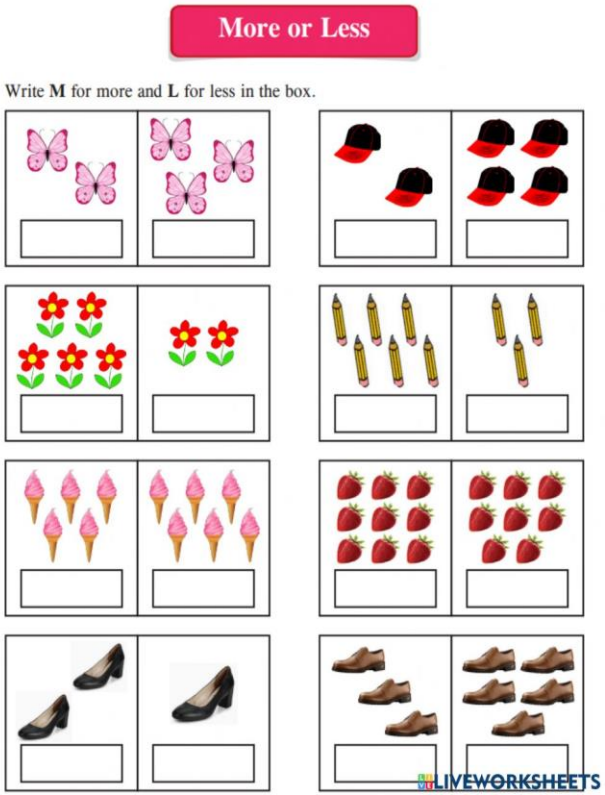
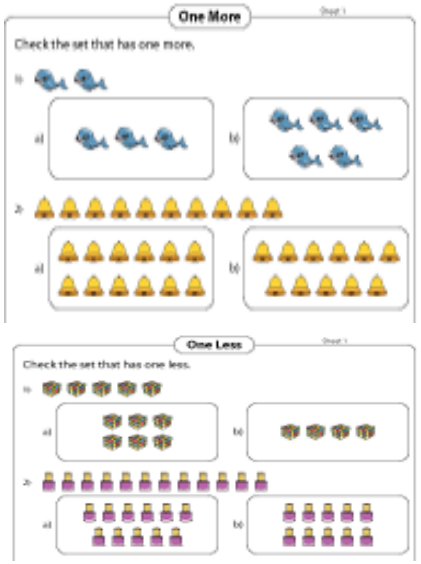
Elements that are integrated across subjects:

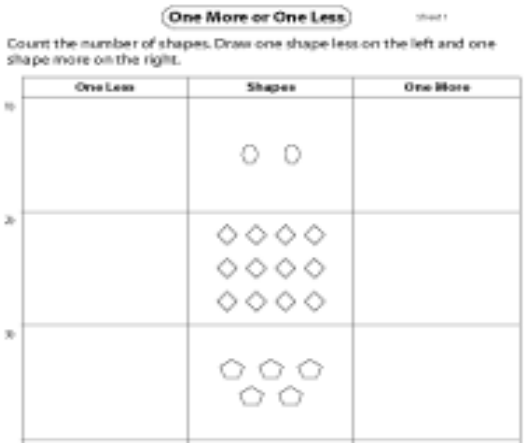
Elements from Local Culture, Technology, TVET, Environment that are integrated:

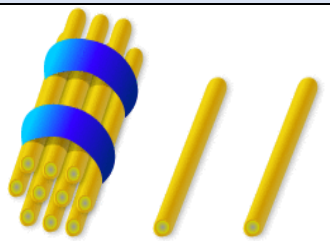
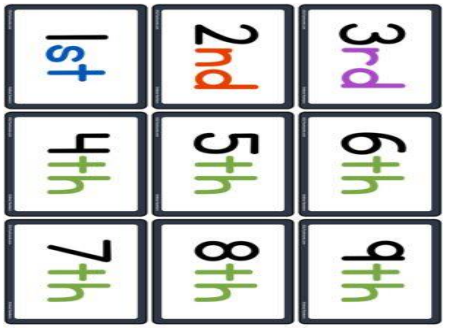
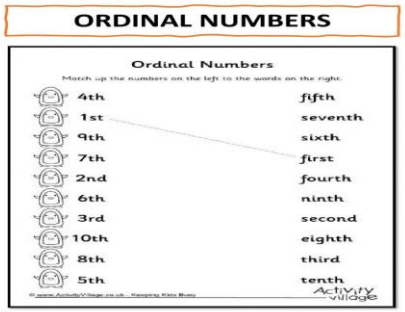
Introduction to the Subject: Number sense refers to the ability to make connections and demonstrate an understanding of how numbers relate to each other. It is important for students to develop an appreciation of the size and scales of numbers and be able to use their knowledge to make comparisons between numbers (more and less) as well as to order objects numbers ordinally.
Strand (Topic): *Number Sense*
Essential Learning Outcome: 1.3 *Students will be able to demonstrate their understanding of numbers and their values by comparing and ordering quantities up to 20*
Grade Level Expectations: *Whole numbers up to 20 with exploration to 100*

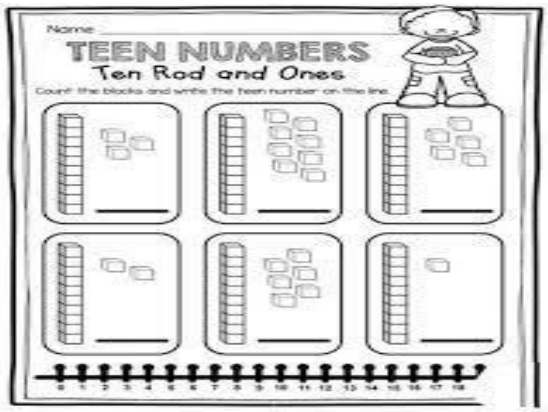
Specific Curriculum Outcomes:	***Inclusive Assessment Strategies:***	***Inclusive Learning Strategies:***
Learners will be expected to: ● ***Build sets and set models to show how numbers compare*** ● ***Explain which set has more and which set has fewer.*** ● ***Build a set that has fewer or more than a given set up to 20*** ● ***Build a set that is between two given sets.*** ● ***Use ordinal language (first, second, third……)***	***Observation*** ● *Concrete: Check to see whether learners can count manipulatives in two given groups and identify the group with more or the one with fewer* *Game:* *Students will be placed into groups of 3. 2 will dip a number and jump on the number line based on their chosen numbers. The distance (number of squares) jumped by each will be observed and recorded by the 3rd group member.*	**The learners will:** ● Build sets to show the comparison with bigger and smaller; more and less. ● Arrange given groups/sets of numbers in either ascending or descending order. ● Uses comparative language to show greater than, few, more, less and same ● Use the three relationships (more/greater than, less/less than, and same/equal to), and construct sets using counters as well as make comparisons or choices between two given sets.

Specific Curriculum Outcomes:	*Inclusive Assessment Strategies:*	*Inclusive Learning Strategies:*
• ***Discuss the importance of the number 10.*** • ***Explain that teens numbers are represented as 10 and more.*** • ***Use models such as ten frames to show numbers up to 20 as 10 and some more.***	 • *Pictorial: Observe students as they count given quantities and identify the larger and smaller group.* • *Symbolic: Have students count and write numerals based on a representation shown for groups to identify the one that has less or more (students may be given groups with less first or more)*	• Provide activities in a spirit of inquiry with requests for children's explanations, such as "Can you show me how you know this group has less?" • count objects placed in groups to identify the larger set  • Use number lines to compare numbers by jumping. • Use worksheets to identify the group with more or less by coloring / shading the box.

Specific Curriculum Outcomes:	*Inclusive Assessment Strategies:*	*Inclusive Learning Strategies:*
	 **Product -Exit slip** • *In the given columns students will draw one more or less object of a given set* **Product-Group work**	 • Draw one object less and one more of a given number in the given columns.

Specific Curriculum Outcomes:	*Inclusive Assessment Strategies:*	*Inclusive Learning Strategies:*
	• *In groups, students will be given two numbers and be asked to create a set that comes between the numbers . Each group will share their set with the other groups.* • *List the ordinal positions going forward as well as in reverse order.* **Match pair share activity** ➢ *Have learners pair with each other to arrange different given coloured objects (eg. marbles, small balls, eggs etc) based on assigned ordinal positions.* **Think , pair share** 1. *Have students work in pairs and choose and write in symbols a number from eleven to nineteen and take that many sticks. Have them count out and make one bundle of ten using the hair tie, then write and draw what they have. For example:*	 • Order numbers presented in various formats, (numerical, pictorial, concrete/digital) and explain reasoning; i.e. Least to greatest and greatest to least *Engage in activities to help them explain an object's or event's position in a sequence:* *Watch 10 students run a race and say what the person who wins is called, the person who came next and so on* *Answer question on the placement of animals using ordinal numbers*

Specific Curriculum Outcomes:	*Inclusive Assessment Strategies:*	*Inclusive Learning Strategies:*
	 ***12 is ten and two*** 2. *Ask the pairs to return to the whole group with their drawings, keeping them hidden. Have the pairs take turns to describe to the class what they have drawn, and ask classmates to say what number it is. The drawing done by the pair will then be shown.* **Exit Slip** *Several pictures of different quantities will be presented. Students should look at pictures, count the amount, order them and provide the ordinal position of the picture .*	*https://www.liveworksheets.com/ua1828994qk* *Have ten students stand in straight line and have their peers give their position as an ordinal number Arrange cards with ordinal numbers in order*  *Match ordinal numbers to their numerals*  *Write the number that is formed based on ten plus some*

Specific Curriculum Outcomes:	***Inclusive Assessment Strategies:***	***Inclusive Learning Strategies:***
		

Useful Content Knowledge for the Teacher about the Outcome:

Use of self assessment tools and checklist for observable behaviors from students' e.g. students attitude while they continue to work in groups and the extent to which students are able to complete tasks

Ordinal numbers - An ordinal number is a type of number that is used to represent the position or rank of an object or a person. *Ordinal numbers or ordinals are written using numerals as prefixes and adjectives as suffixes. 1st, 2nd, 3rd, 4th, 6th*

Number line - a pictorial representation of numbers on a straight line. The numbers on a number line are placed sequentially at equal distances along its length.

Subitise - being able to recognise at a glance familiar arrangements of dots or objects e.g dice patterns and ten frames.

Inclusive Resources and Materials from Regional Specialists

- Variety of manipulatives such as plastic eggs, ten frames, fingers, sticks
- Worksheets
- Number lines
- Textbook

Additional Resources and Materials

Comparing Numbers and Making Teens Worksheets:

https://www.slps.org/cms/lib/MO01001157/Centricity/Domain/1432/TeenNumbersWorksheetsMEGAPACK.pdf

More or less worksheets https://www.mathworksheets4kids.com/one-more-one-less.php
https://www.k5learning.com/free-preschool-kindergarten-worksheets/more-than-less-than
https://mathskills4kids.com/comparing-numbers-worksheets-for-grade-1
https://www.mathbrix.com/skills/comparison (interactive)

Making Teens https://www.splashlearn.com/math/identify-teen-numbers-games (interactive)

Ordinal Numbers https://www.mathworksheets4kids.com/ordinal-numbers.php
https://www.k5learning.com/free-preschool-kindergarten-worksheets/ordinal-numbers
https://www.softschools.com/math/ordinal_numbers/games/ (interactive)

I can write a teen number song https://www.youtube.com/watch?v=al5OqpARGD8

Ordinal Numbers https://www.youtube.com/watch?v=AYZ0iWGopA8

https://www.youtube.com/watch?v=fR8KyCt5XtA

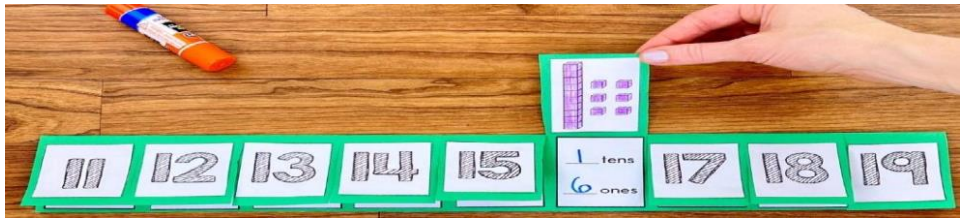
Atwood , Megan Balancing Bears : Comparing Numbers (counting, comparing numbers)

https://www.education.com/game/urple-and-burple/ - *story about two troll brothers* **which** *will help students practice counting up sheep and yams to find out who has more and who has less while they read.*

Opportunities for Subject Integration:

Speaking / Cooking /Science *: Students can be asked to talk about how to make a simple food item and if possible have students create an item at school by following the steps e.g. For those just learning the concept of ordinal numbers, let them complete 3 steps. "First, pour in the pudding mix. Second, pour in 2 cups of milk. Third, stir it all together."*

Arts and Craft*: Students will be asked to fill a teen number lift-the-flap craft*



Multiple Subjects*: Write their dates at the start of each subject using ordinal numbers eg. Monday 10th April 2023*

Social Studies: *Comparing family size (single parent, nuclear, extended)*
Independence Dates of islands and other important feast days are written using ordinal numbers
Have students discuss the grouping of islands, Greater and Lesser Antilles and determine which grouping has more and which has Less

Writing*: Ordering sentences/ pictures to tell a story*

Comprehension*: Read a story and answer questions based on the sequence of events https://www.liveworksheets.com/cr2788191zm*

Physical Education: *Record positions for places in races, and other sporting activities or any competitions*

Science*:*

Elements from Local Culture:

- *comparing various islands*
- *number of members on their family*
- *compare family sizes*
- *recording*

Resources for a learner who is struggling: *(Links to earlier learning activities for similar knowledge, links to resources for special education needs)*
Use of Ordinal story-the animal race: https://www.youtube.com/watch?v=-IAIrsUIcUo and https://www.youtube.com/watch?v=-IAIrsUIcUo

- *Marbles*
- *Plastic eggs*
- *Counters*
- *Base 10 rods and single blocks*
- *Worksheets*
- *Sticks*

Resources for a learner who needs challenge:
Software: Prodigy Math; where students are challenged at various levels on ordering numbers

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):

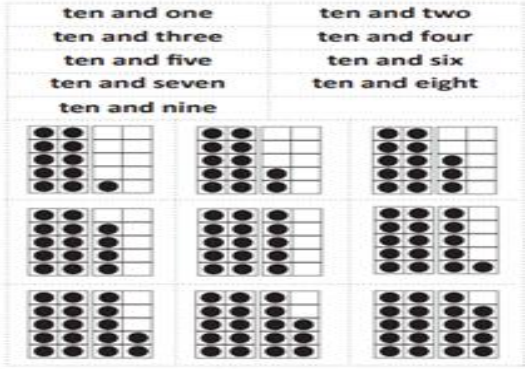
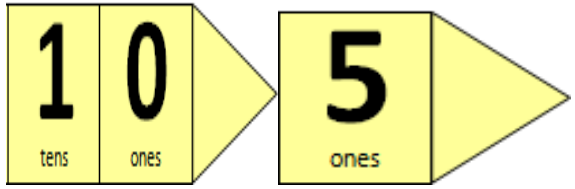
You may be tired , beat up and worn out but you are making a difference. Never give up!

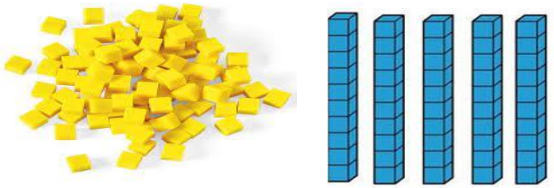
Teaching tip*: Repeated oral counting helps them hear what numbers sound like and to learn their order.*

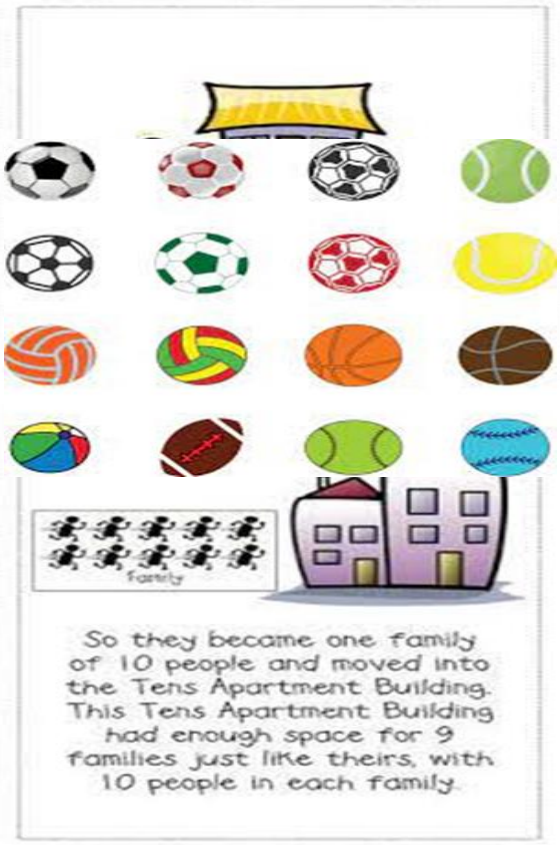
Introduction to the Subject: *An understanding of the place value of numbers is extremely significant to learning operations. It allows learners to compare numbers; line up numbers vertically; make sense of addition, subtraction, multiplication, and division with larger numbers; and is the foundation for regrouping ("borrowing" and "carrying"). This learning outcome will provide the foundation for regrouping, multiple-digit multiplication, and more in the decimal system, as well as a starting point for the understanding of other base systems as learners develop mathematically.*
Strand (Topic): *Number and Operations - Place Value of two digit numbers*
Essential Learning Outcomes: 1.4 *Learner's will comprehend the importance of the number ten and its role when counting from eleven to nineteen, as well as creating and solving simple problems involving place value*
Grade One Level Expectations: *To demonstrate understanding of the number ten as an important number for aiding in counting and that the teen numbers are represented as ten's and some more.*

Specific Curriculum Outcomes:	**Inclusive Assessment Strategies:**	**Inclusive Learning Strategies:**
Key Skill/ Concept: Learners will be expected to: • ***Count teen numbers using familiar numbers.*** • ***Model teen numbers up to 20 in a variety of ways using sets of tens and ones.***	Identify and recognize quantities in teens using tens and ones in concrete, pictorial and symbolic forms. Entrance Slip ❖ Concrete- Allow children to count teen numbers using tens and ones. Observation ❖ Pictorial- Introduce *The Number Slide.* *The Number Slide* transforms the expanded form numbers (e.g., 10 1, 10 2, etc.) into the conventional number (e.g. 11, 12, etc.).	**The students will:** Students should be given opportunities to make and display sets of tens and ones in a number of ways (E.g., using whole number rods) Visualize and interact with teen numbers as ten and "some" more.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• ***Recognize that in a teen number, the 1 represents one group of ten.*** • ***Explain that teen numbers are composed of one ten and one, two, three, four, five, six, seven, eight, or nine ones.*** • ***Compose and decompose numbers from 11 to 19 into tens and ones.***	Product-Groups Work • In small groups students will be given unit cubes to make stacks of tens which will be traded for a single base ten rod. • Given other manipulatives such as shells, bottle tops, candies etc and two plastic glasses of different sizes, students will place only ten in the larger cup and the remainder in the smaller cup and record their findings. Think and share • Learners will be given a group of manipulatives less than 20. Each learner will count the amount given and record it and expand the given amount to represent the amount of tens and ones. The learner will share their findings with the class. Observation • Given a worksheet to complete, learners will circle groups of tens and count the remaining as ones. Product-Playing Games • Roll, Build and write: allow students the fun of rolling dice, along with the opportunity to	 1. Count from eleven to nineteen using the expanded form. 

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	practice building a number with tens and ones. ● **I Have/ Who Has**, this game is played with an I Have/ Who Has deck. Each student gets one card. The person with "start" begins by reading their card. All cards follow the pattern, "I have_____. Who has___?" So a student with 1 tens and 4 ones on their card, would say, "I have 14, who has 18?" Then the learner with one ten and eight ones would read their card. Play continues until all students have had a turn or you reach the card that says end. Exit Slip ● Several pictures depicting different quantities is presented: ★ Look at the picture, count the amount and represent it in a mathematical equation.	 2. Use the Number Slide to transform the expanded form of teen numbers into conventional numbers.  

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		3. Use base ten blocks or other manipulatives that are available to create stacks of tens.   4. Listen and answer questions from a video, a story or simple discussion on tens and one with numbers between ten and twenty. Teenage Numbers - Ten and Ones

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		TEEN NUMBERS ARE SO MUCH FUN! (Identifying teen numbers & quantities)  5. Generate simple mathematical equations using base ten materials to represent teen numbers. example 16 = 10+6

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		Since we are expected to go up to 20 should we show that we no longer have teens when we get two groups of 10?

Useful Content Knowledge for the Teacher about the Outcome: **Teen Numbers:** Numbers from 11 to 19 are considered teen numbers. **Place value** is the value of each digit in a number. For two-digit numbers, there is the TENS place and the ONES place.
Inclusive Resources and Materials from Regional Specialists **Base ten materials,** **Manipulatives such as seashells, bottle tops, marbles etc** **Recommended text**
Additional Resources and Materials **Software** **www.splashlearn.com** **www.quizziz.com**
Opportunities for Subject Integration: **Social Studies: grouping families, islands** **Language Arts: Stories, fill in missing letters in Spelling of teen numbers given the representation and number** **eg.** **__ __ __ teen**

Art and Craft:

Elements from Local Culture:

- **Grouping fruits**
- **Number of persons in different sports**
- **Seashells**
- **Stones**
- **Sticks - to make their own bundles**

Resources for a learner who is struggling:

- **Place value charts**
- Counter tops
- Shells
- Base Ten
- Worksheets
- 2D shape of a house to represent the storyline on family

Resources for a learner who needs challenge:

- **Worksheets**
- **Work with numbers up to 30 or 40 depending on the learners need**
- **Problem solving pertaining to place value**

Strategies that Support the Curriculum and Assessment Framework

Elements that are integrated across subjects:

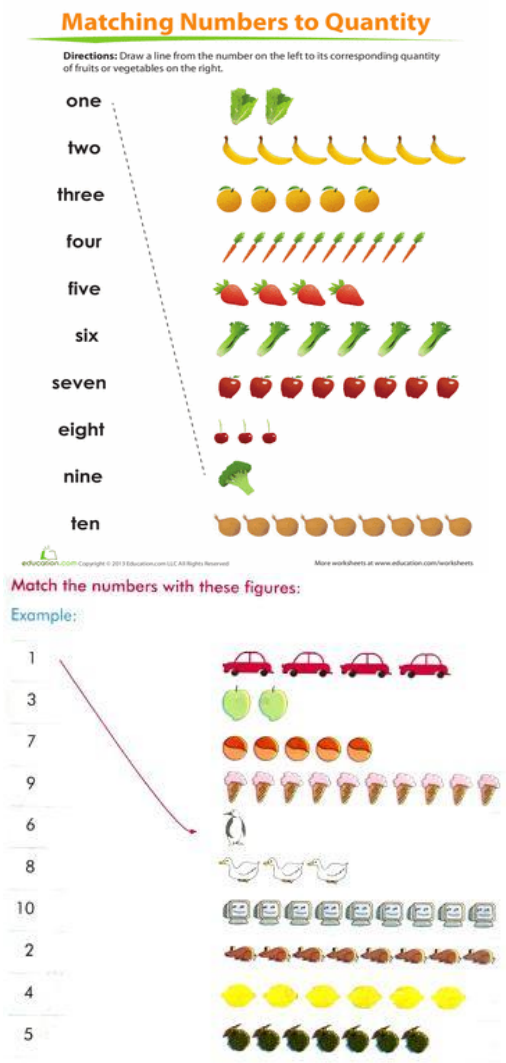
Elements from Local Culture, Technology, TVET, Environment that are integrated:

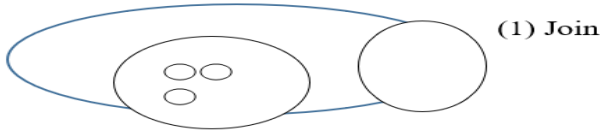
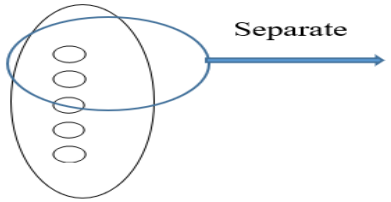
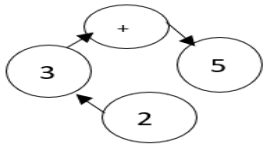
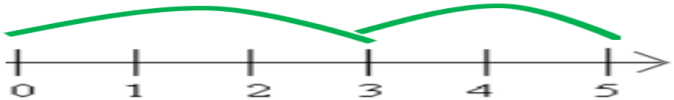
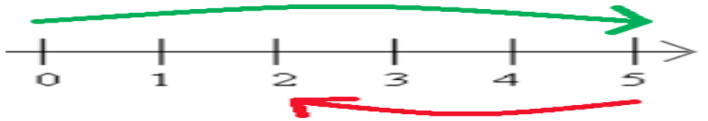
Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

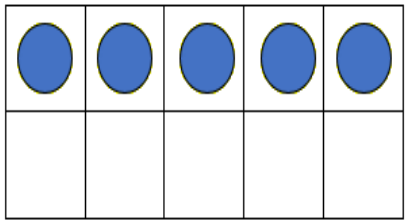
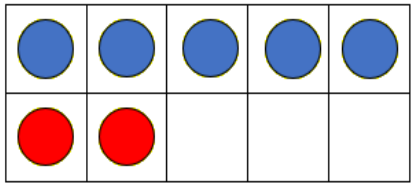
Operations with Numbers

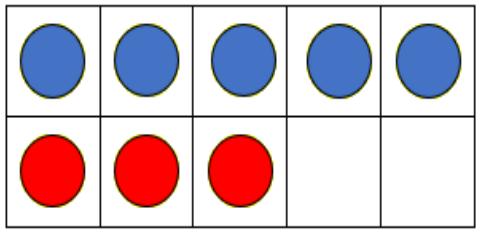
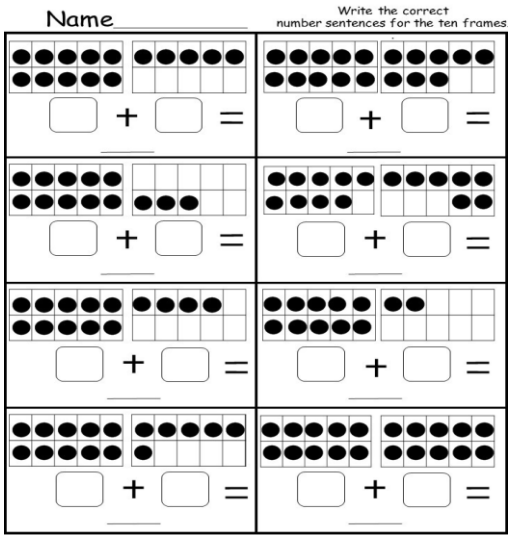
Introduction to the Subject: *Additive thinking is built upon counting strategies but is different in that it considers what students know about numbers and the relationships between the numbers, and not just the counting sequence. This enables learners to manipulate numbers by joining, separating, and comparing while engaging in flexible mathematical reasoning. When applying additive strategies, students may manipulate numbers using their part-part-whole knowledge, renaming and partitioning of numbers (including using place value knowledge) and the inverse relationship between addition and subtraction.*
Strand (Topic): Operations with Numbers
Essential Learning Outcomes: 1.1 *Additive Thinking- Learners will understand the meaning of addition and subtraction and how they relate.*
Grade Level Expectations: *Totals or missing values up to 20*

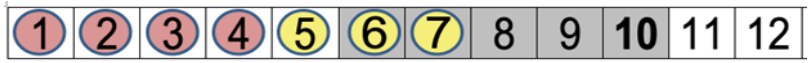
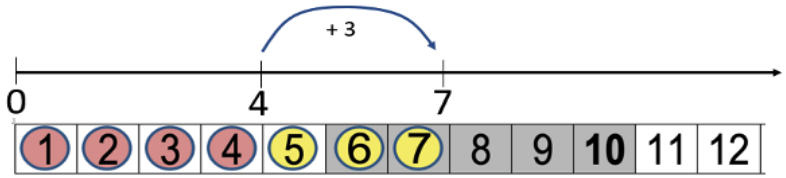
Specific Curriculum Outcomes:	**Inclusive Assessment Strategies:**	**Inclusive Learning Strategies:**
1. Learners will be expected to: • **Combine quantities (sets, lengths, etc.) using concrete materials to get the total or find a missing value up to 20.** • **Partition and recombine quantities to relate to addition and subtraction.** • **Explain how addition and subtraction are related.**	• Entrance Slip which assesses students' ability to match or draw quantities up to 10 .	**The students will:** Give students opportunities to separate and combine quantities using a variety of concrete materials and explain their thinking. Can students make multiple representations from a story problem structure? e.g. There are 5 pieces of fruit in a bowl. If there are two kinds of fruit, what might they be and how many of each? If there are 12 counters in a bag. Some are red and some are blue. If there are 8 red counters, how many are blue? Use games to demonstrate how addition and subtraction relate to each other, ex. walking on a number line. Collect materials outside and compare, combine, and separate quantities. e.g. leaves, shells, popsicle sticks, bottle caps, etc. (Connect to data collection)

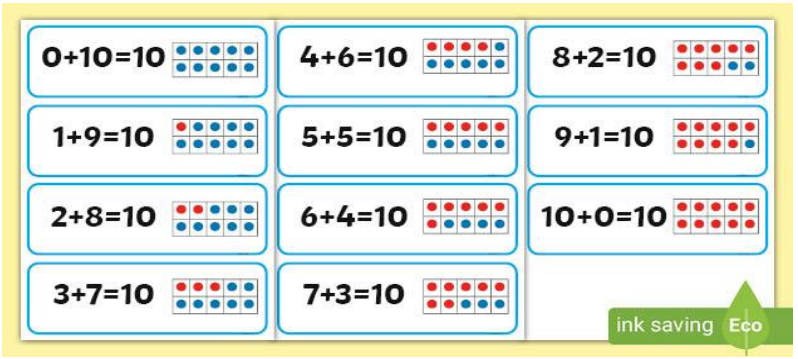
Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **Add and subtract within 20, using a variety of strategies.** • **Determine if equations involving addition and subtraction are true.** • **Separate quantities to find a missing value from a number up to 20.** • **Comparing two quantities to find the difference from a number up to 20**		Sing action songs that focus on taking away or removing. e.g. Ten little monkeys, ten green bottle, etc. Comparing Children will use a pan scale to show different amounts and talk about which is larger, which is smaller, and what is the difference. Children can make towers with blocks to talk about which is taller, which is shorter and what is the difference. Students can compare heights (link to measurement). Playing with sets of objects, students can act out combining, separating, and comparing. Students can model different story problems to find the missing value. Give students opportunities to show how addition and subtraction undo each other. e.g. 6 + 3 = 9 and 9 – 3 = 6 Students should be able to demonstrate that 3 + 2 = 5 then 5 – 3 = 2

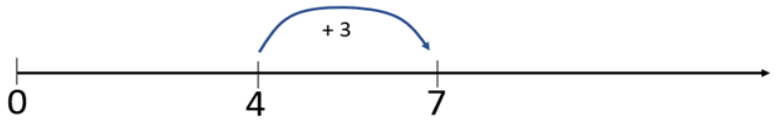
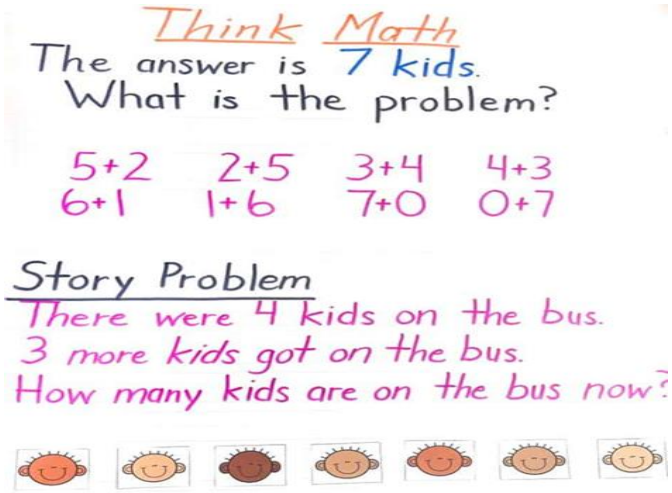
Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	• Learners are introduced using a diagram or picture to communicate an addition equation. The numbers may be adjusted in the lesson based on student's aptitude. **Observation** • Introduce learners to the idea of recording what the diagram shows by allowing them to write the number sentence. H*ow many blue counters are there?* (Write 5.) *And how many red counters are there?* (Write 3) *5 and 3 make how many counters?* *Record the equation 5 + 3 = 8.* **Think and Share** Students will create their own number sentences using manipulatives and tens frame provided and share them with the class. **Product-Playing Game** Using an egg carton with a given amount, students will find out how many are needed to fill it, then write the number sentence.	  (ii) or   3 + 2 = 5  5 – 3 = 2 Give students opportunities to look at a group of numbers and say how they are related (fact family e.g. 4 + 3 = 7, 3 + 4 = 7, 7 – 3 = 4 and 7 – 4 = 3) From given diagrams students will complete the fact family vertically and horizontally.

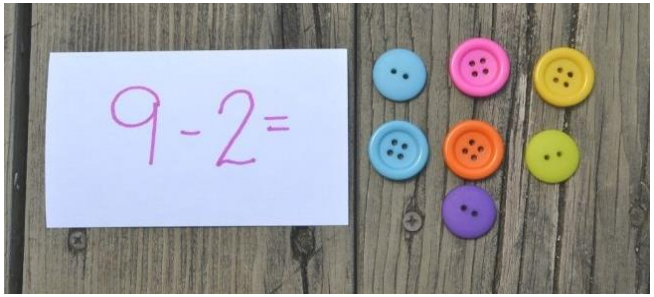
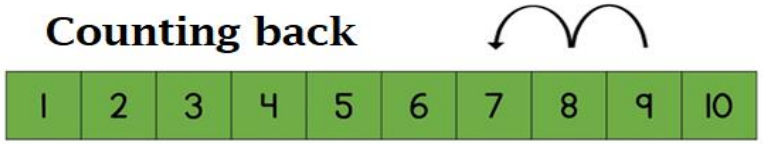
Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Use caution tape to model a bus with 16 spaces by wrapping around 8 double or 16 single seats in the class or any amount within 20 based on class size. Probe students by asking - • *How many passengers can the bus hold?* • *How do you know? Some students may recognise based on the number of seats.* Place 7 students in the taped area and ask the following: • *How many passengers are on the bus?* • *The bus needs to be filled. How many more passengers do we need?* **<u>Product- Group Work</u>** Make copies of the tens frames and allow students to complete addition equations for stories you give them. **Observation** • Number bonds to 10: Learners explore the different number combinations that add up to make 10.	Give students opportunities to build their vocabulary e.g. a way to add is by counting on from a given number 6 + 2 = 8; a way to subtract is by counting backward from the greater number 5 – 2 = 3 Give students the opportunities for them to brainstorm that a fact family includes all the addition and subtraction facts that use the same numbers. **1. Counting On** Place counters in a tens frame, any amount up to ten. The tens frame will support subitising (instant recognition of number in a set)  Place 2 red counters in the tens frame and ask: H*ow many counters are in the ten frames now?* 

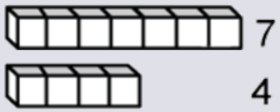
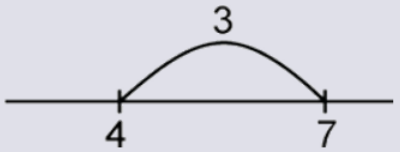
Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	• Check that learners can work out the different number combinations that add up to 10. • Allow students to place manipulatives on a number line to represent the story that is being told. As the students model with the materials, say: "Grade 1 students are baking cupcakes. Yesterday, they baked 4 cupcakes. Today they baked another 3. How many cupcakes did Grade 1 bake?" **Think Pair Share** • Check that learners can work in pairs to link story problems to the corresponding expression. This is then shared with the class and learners are to explain why they chose their answer. **Observation** • *Concrete:* Have learners use manipulatives to subtract; Give students 10 buttons and make them take away different quantities from it.	Using two different colours will help encourage students to count on and support subitising (recognising 7 counters instantly) Repeat the process by manipulating the numbers from 1 to 20. **2. Write number sentences.**  5 plus 3 equals 8 

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	• *Symbolic:* Check that students can write equations to represent their work. • *Pictorial:* Have students use a number line to count back to subtract. • *Modelling:* Check that learners can represent the difference between two numbers using concrete materials and diagrams **Product- Playing Game** • Allow learners to work in pairs using number grids to answer questions on subtraction by counting back.	• Use number line as a way to represent addition problems up to 20 from concrete to abstract.  Using manipulatives such as counters or unit cubes, allow students to place them on a number strip (e.g., 4 red counters). Let another student add another amount, let's say three counters in a different colour.  

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		Use an egg carton, can add up to 12 or children on a bus.  3. **Use manipulatives to represent addition equations.** They work on simple "change unknown" problems (e.g. 5 + □ = 12) ● Watch this video to learn the number bonds to ten song I Know My Number Bonds 10 | Number Bonds to 10 | Addition Song for Kids | Jack Hartmann 

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		 

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		 • Link the terms take away and minus when showing students how to write out equations involving subtraction. **9 *take away* 2 is equal to 7**  9 - 2 = 7

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		▪ *Concrete materials:* The difference between 7 and 4 represented by blocks.  ▪ *Diagrams:* The difference between 4 and 7 shown as a 'jump' of 3.  ● Use phrases such as 'the difference between' to help learners compare quantities. ● Give a number grid and a coloured counter to each pair. Students place the counter on whatever number the teacher calls and counts back to find the answer based on how much they are asked to subtract. E.g. Teacher: 12 *-Students place counter on number 12* *-Teacher* rolls die to tell students how much to subtract (4) *-Students move the counter back 4 times and raise their hands to call the answer they land on.*

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		

Useful Content Knowledge for the Teacher about the Outcome:

- Apply the terms 'add', 'plus', 'equals', 'is equal to', 'is the same as', 'take away', 'minus' and 'the difference between' to describe combining and separating quantities.
- Use the equals sign to record equivalent number sentences involving addition, and to mean 'is the same as', rather than as an indication to perform an operation.
- Use the number line to represent numbers on a straight line. The numbers on a number line are placed sequentially at equal distances along its length. It can be extended infinitely in any direction and is represented horizontally or vertically.
- Number bonds are pairs of numbers that bond through addition to form another number. Number pairs that bond to form 10 are particularly useful when adding or subtracting.

Addition and subtraction problems can be categorized based on the kinds of relationships they represent. It is important that all of the following structures of problems be presented and that these are developed from students' experiences. These structures include:

Join			Part-Part-Whole	Compare
Result Unknown	**Change Unknown**	**Start Unknown**	**Whole Unknown**	**Difference Unknown**
Pat has 8 marbles. Her brother gives her 4. How many does she have now? 8 + 4 = ?	Pat has 8 marbles, but she would like to have 12. How many more does she need to get? 8 + ? = 12 or 12 – 8 = ?	Pat has some marbles. Her brother gave her 4 and now she has 12. How many did she have to start? ? + 4 = 12 or 12 – 4 = ?	Pat has 8 blue marbles and 4 green marbles. How many does she have in all? 8 + 4 = ?	Pat has 8 blue marbles and 4 green marbles. How many more blue marbles does she have? 8 – 4 = ? or 4 + ? = 8
Separate			**Part-Part-Whole**	**Compare**
Result Unknown	**Change Unknown**	**Start Unknown**	**Part Unknown**	**Smaller or Larger Unknown**
Pat has 12 marbles. She gives her brother 4 of them. How many does she have left? 12 – 4 = ?	Pat has 12 marbles. She gives her brother some. Now she has 8. How many marbles did she give to her brother? 12 – ? = 8 or 12 – 8 = ?	Pat has some marbles. She gives her brother 4 of them. Now she has 8. How many marbles did she have to start? ? – 4 = 8 or 8 + 4 = ?	Pat has 12 marbles. Eight are blue and the rest are green. How many are green? 8 + ? = 12 or 12 – 8 = ?	Pat has 8 blue marbles and some green marbles. She has 4 more blue marbles than green ones. How many green marbles does she have? 8 – 4 = ? or ? + 4 = 8

source Van de walle et al.(2018)

Inclusive Resources and Materials from Regional Specialists:

- Variety of manipulatives such as cubes, counting bears, buttons, five and ten frames, fingers, or counters.
- Number grids
- Worksheets
- Number lines
- Grade mathematics text

- Apps such as Quizziz and NUMBOTS, Khan Academy, BuzzMath, splashlearn

Additional Resources and Materials

Opportunities for Subject Integration:

The Number Bonds to 10 Chant

(jazz chant – scouts march)

Which 2 numbers add to ten?
Learn this chant and you'll know them.
(clap, clap, clap, clap)

1 and 9, let's draw a line,
Draw a heart and draw a sign.
1, 9, 1, 9

8 and 2, now buckle your shoe,
Tie your hair and dye it blue.
8, 2, 8, 2,

7 and 3, point at a tree,
Point at you and point at me.
7, 3, 7, 3

6 and 4, jiggle on the floor,
Wave your arms and wiggle some more.
6, 4, 6, 4

5 and 5, to the beach we drive,
Splash in the water and go for a dive.
5,5,5,5

Now we've learnt all the pairs to ten.
That was fun, let's start again!
(clap, clap, clap, clap)

Art and Craft:

Poetry/Music:

Elements from Local Culture:

- Use of local manipulatives for adding and subtracting- beads, bottle caps, sticks, food items etc.

Resources for a learner who is struggling:

- Increased use of concrete materials including fingers
- Simple worksheets with quantities up to 10

Resources for a learner who needs challenge:

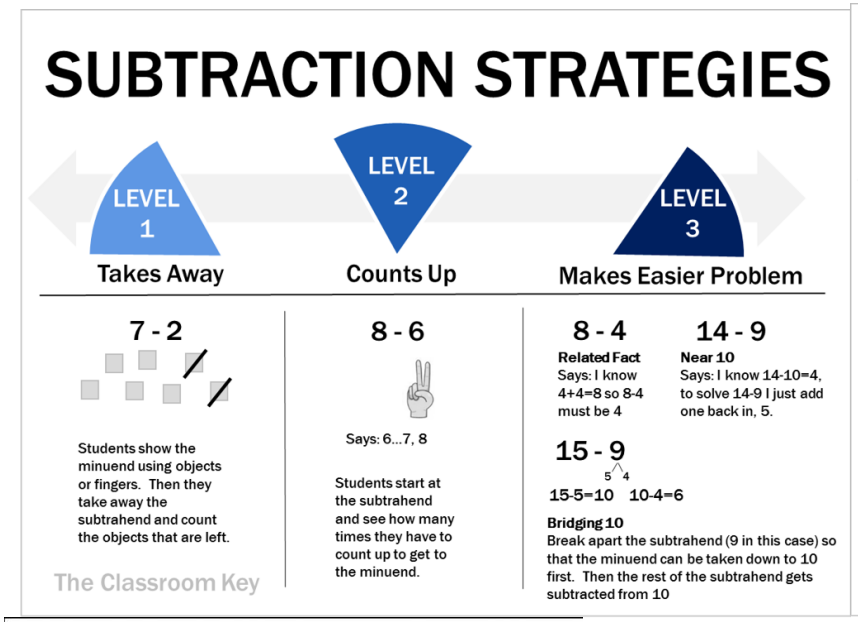
- Addition and subtraction of quantities greater than 20
- More challenging word problems- to include quantities exceeding 20

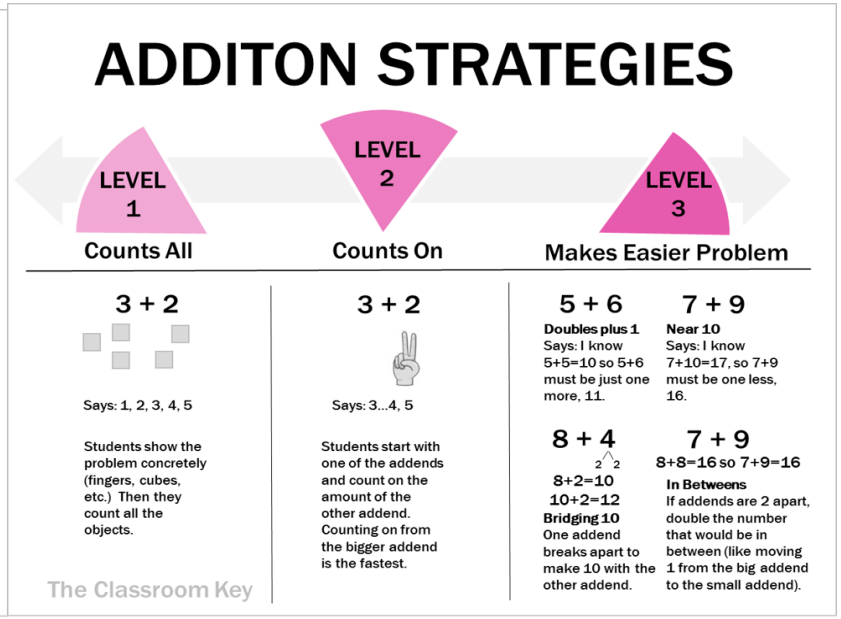
Strategies that Support the Curriculum and Assessment Framework

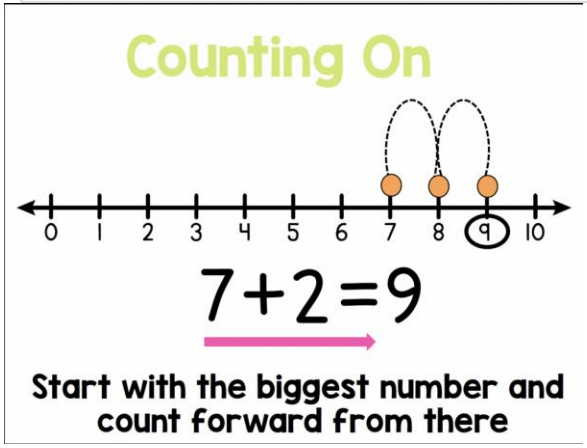
Elements that are integrated across subjects:

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

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

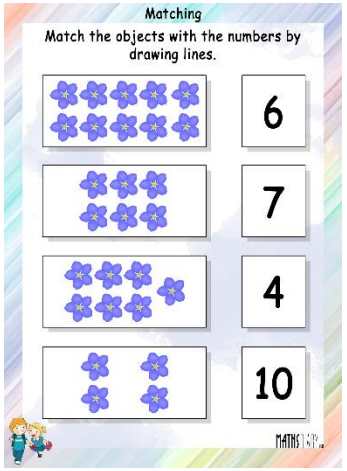
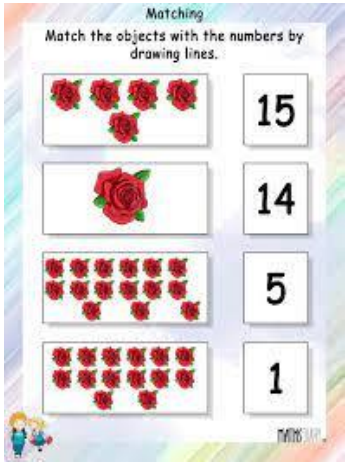


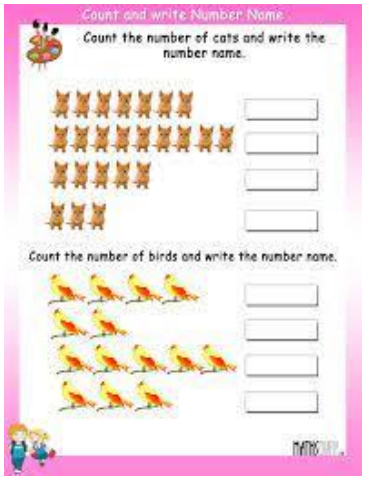
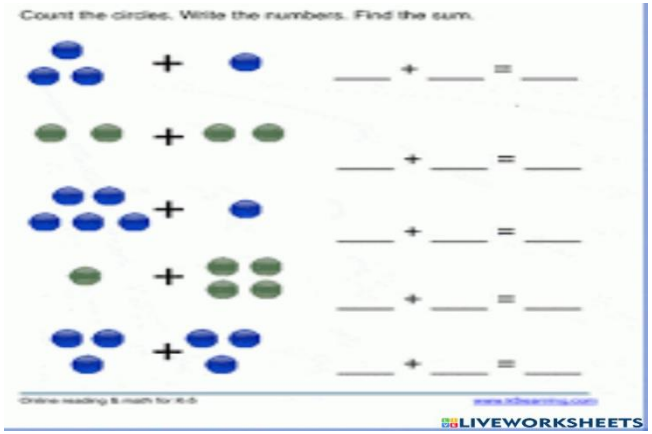


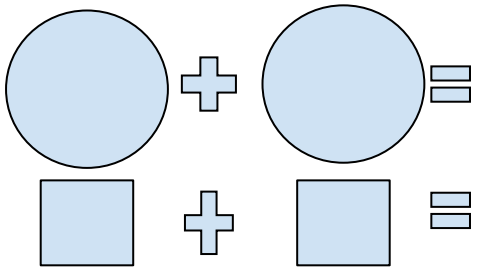


Introduction to the Subject: *Additive thinking/computing fluently builds on counting strategies when developing mathematical reasoning. It uses prior knowledge of relationships between numbers and to make references about the sum (US Department of Education, n.d.).* *Developing computing fluency through additive thinking will boost students' confidence in Mathematics concepts and problem solving as they will be more motivated and have a more positive attitude towards mathematics. Students will develop a love and appreciation for numbers and how to use the relationship that exists between numbers to solve problems.*
Strand (Topic): *Operation with Numbers*
Essential Learning Outcome: *1.2 Additive Thinking - Compute Fluently*
Grade Level Expectations: *Use symbols to record what has been built with concrete materials; no expectation to calculate, use symbols only.*

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Students will be able to: • **Using symbols for addition (+) and subtraction (-) as a way to record calculations done through stories, building, and drawing.** • **Make reasonable estimation when combining, separating, comparing & partitioning quantities to 20.**	***Observation*** • *Have students use manipulatives/pictures) make, draw and or tell the number amount in a group or set.* • *Have students write symbols (numbers) to represent an amount in a group/set.* ***Whole Class Activity*** • *Class discussion on the symbol (+) of addition.*	***Have students -*** • *count and combine objects into different groups and move them around to find the answer.* • *show the part + part = whole using small objects to practice solving problems. For example Set up 20 bowling pins (or cups) and use a ball to knock some down. Record subtraction equations to represent what is left standing (i.e. 20 pins –? = ?).* • *Practice decomposing whole numbers into various parts using concrete objects and record using symbols.* • *Represent number sentences after decomposing using numerals and symbols.* • *Use concrete models (blocks), drawings, and then symbols (numbers) to represent number facts.*

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Teacher demonstrates/prompts as students come up with their own words that tell (+) addition. ***Think Pair Share*** • *In small groups, students are given cards or manipulatives to write the symbolic representation of what is on the card or what they made using the manipulatives.* ***Observation*** • *Have students write/transfer manipulatives/pictorial addition amounts to symbolic representation.* ***Exit ticket: Game*** *In pairs, small groups or whole class e.g: students roll two dice, then write symbolic representations showing additive thinking.*	• *Use storyboards to add/subtract items and record results.* • *Match the set to its number symbol.*  

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		• *Write the number (symbol) to the set/group shown.*  • *Use symbols to represent the pictures shown.* 

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		Learner difference: *Students self evaluation activity.* 1. *Draw any amount of objects in the circles then write the correct number symbol to match.*  2. *Students needing a challenge would be given a working card same as above but would move to numbers greater than 20.* *Eg: show: 23 + 17 =* *or* ********** + ********** = ********** ********** 3. *Match the pictorial representation to its symbolic representation e.g.* **** +********* | *3 + 5*

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:

***** + ******* *****	*16 + 5*
*** + *****	*4 + 9*
****** + ***** ****** ****	*10 + 7*

Useful Content Knowledge for the Teacher about the Outcome:

Number symbols are figures or digits that represent a set or amount. Eg . (number symbols: 0, 5, 18 etc)
Vocabulary words related to (+) e.g: sum, total, altogether, add, join, increase, combine, plus)

Inclusive Resources and Materials from Regional Specialists

Working Boards, Text books, counters, picture cards, students and students PK.
Interactive site: liveworksheet.com

Additional Resources and Materials

Youtube.com (type in count and match)videos

Coco Kids
Koohi Kids
Kids Academy
Nono TV

Opportunities for Subject Integration:

Language/Reading/Comprehension/Writing

eg: Mum has  *bananas.*

_____

Write a sentence about the picture.

Vocabulary

Inclusion of the number names during vocabulary lessons: zero to twenty.

Social Science

Draw your family and different family types then write the number to say how many people in total make up that family.

Science

Draw and write the number to say how many….

- *Toes……*
- *Eyes..*
- *Ears..*
- *Finger..*
- *Nose…*
- *All of your fingers + all of your best friend's fingers*

Elements from Local Culture: *Use of stones, shells, beans, bottle caps, twigs, fruits as manipulatives to demonstrate additive thinking.*

Resources for a learner who is struggling:
Site: liveworksheet.com
youtube .com: videos as in other resources
Software: Khan Academy, BuzzMath, Marble Math Junior

Resources for a learner who needs challenge:
Site: liveworksheet.com
(match number to its name/ match number to the amount)

Present students with worksheets that go beyond 20

Strategies that Support the Curriculum and Assessment Framework

Elements that are integrated across subjects:
Social Science and math
Number of days of the week/month and months of the year.

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

Song: Days of the month
30 days has September, April, June and November.
All the rest have 31 days except February alone, which has 28 days clear and 29 in each leap year.

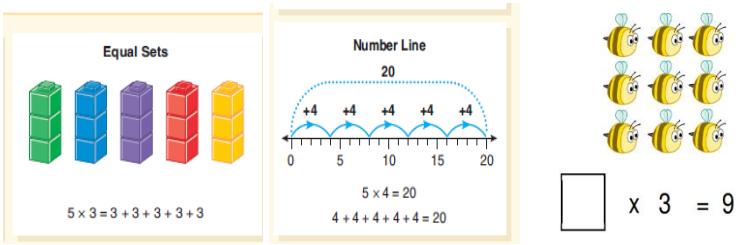
Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

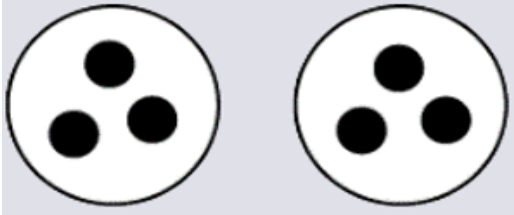
The students in your care are **NEVER** wrong. They have just **NOT YET** understood.

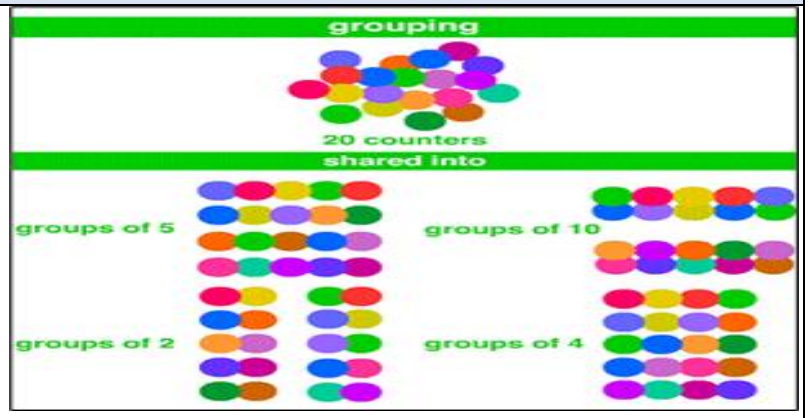
Teaching Mathematics isn't about teaching the concept but rather showing the relevance of the concept in the lives of the students at their age.

Teaching tip: Remember that math has to be **ALIVE** and **REAL**. Take the students outside to experience the lesson. **LET THEM TALK/EXPLAIN**. (the lesson is not for you the teacher but for the students)

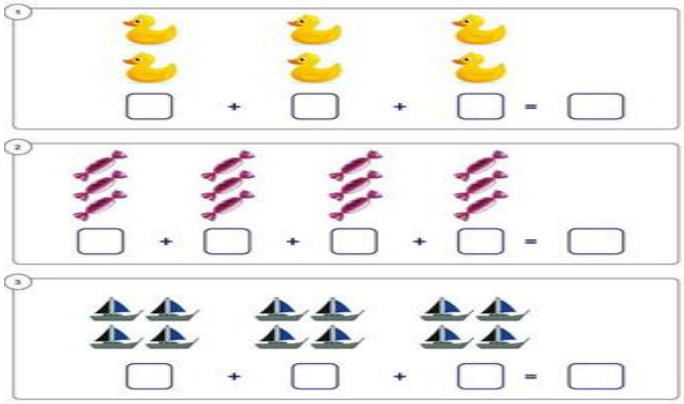
Introduction to the Subject: *Multiplicative thinking builds on counting strategies and additive thinking. Learners can begin thinking about multiplication as repeated addition, but in order to reason multiplicatively, learners must be introduced to bigger sets than one group at a time. This demands that learners consider the number of groups, the number in each group, and then skip count to find the totals.*
Strand (Topic): Operation with numbers
Essential Learning Outcome: 1.3 *Multiplicative thinking - Learners will understand the meaning of multiplication and division and how they relate.*
Grade Level Expectations: *Skip counting, repeated addition and the concept of sharing objects into equal groups*

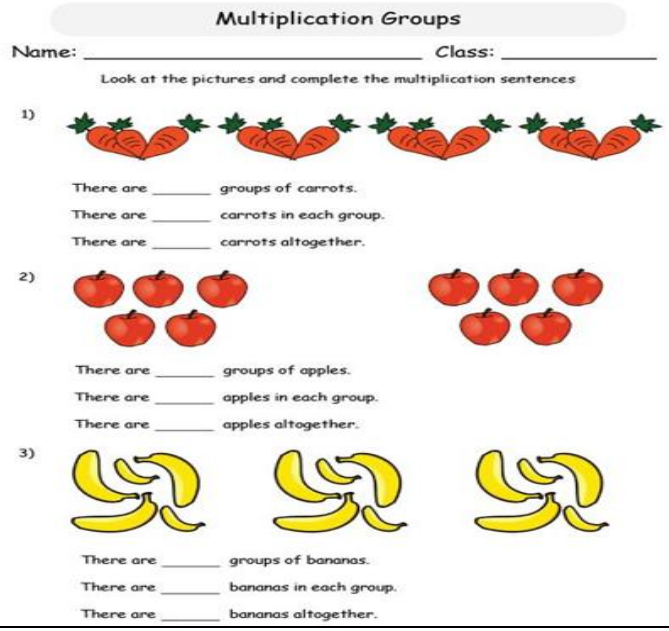
Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Learners will be expected to: ● **Model and describe equal collections of objects as ___ groups of ___.** ● **Form equal groups of objects and use repeated addition to represent the group.** ● **Skip count to find the total number of objects in groups.** ● **Write mathematical statements to represent groups of equal objects.**	**Observation** ● Listen to learners describe equal groups by saying ___ groups of ___ ● *Concrete:* Check to see that learners can build groups (1s-10s) using manipulatives. Learners can form groups using 20 objects however, advanced learners can form groups exceeding 20 objects. ● *Symbolic:* Have learners represent their work by writing repeated addition equations. ● *Pictorial:* Have learners count groups of objects on a worksheet to find a total.	**Learner will be -** Provided with opportunities to work with Equal group problems involve three quantities: the number of groups (sets or parts of equal size), the size of each group (set or part) and the total of all the groups (whole or product) in a variety of ways.  Make the connection that multiplication and repeated addition produce the same results for positive whole numbers. For example ● 1 × 3 means add 3 one time. ● 2 × 3 means add 3 two times.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **Share objects into equal groups and state how many objects are in each group.** • **Write mathematical statements to represent equal groups of objects shared.**	**Group work** • Check that learners can build a group of numbers in rows and columns using an array. **Game** • Have learners create different groups, as a class, in the form of a game. **Discovery learning** • Allow students to discover the different ways in which an even number of items/manipulatives can be shared equally. **Observation** • *Pictorial:* Check that learners can share items into equal groups by circling and then counting the number of groups made. • Check learners' understanding with an exit ticket. **This ticket can be given at the beginning of the topic as well as the end of the topic.** The teacher can compare them to see whether learners have made progress.	• That is $2 \times 3 = 3 + 3 = 6$ • Similarly, 3×2 means add 2 three times. • That is, $3 \times 2 = 2 + 2 + 2 = 6$ • In the multiplication of $3 \times 2 = 6$, 3 and 2 are called **factors and 6 is a product. The first number (3) in equation 3 × 2 is called a multiplicand** and the second number (2) is called a **multiplier.** Provided with the opportunity to write story problem using the multiplication sign and explain what the two factors mean. For example 4 * 8 refers to 4 sets of 8, ▪ Two groups of three.  • Use manipulatives to build groups, e.g. learners group 20 objects into (2s, 3s, 4s…10s). Learners will count the number of groups formed *(remaining objects that do not form a group can be placed on a side)* as well as the total number of objects used. The rest forms a group but not an equal group like the other sets.

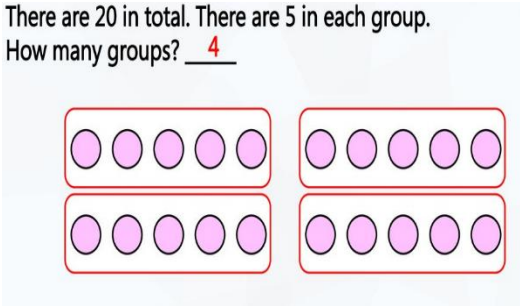
Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		 e.g. Placing 20 objects into groups of 3s gives 6 groups of 3. Learners skip count to find the total of 18 items. Learners write mathematical statements to represent their findings: e.g. 3+3+3+3+3+3 =18; six groups of three make 18.  3 + 3 + 3 + 3 + 3 + 3 = 18 • Show students a Youtube video on how to group objects and write a repeated addition equation to represent the grouping. • Show Equal Groups with Repeated Addition • Alternate Video Multiplication as Repeated Addition This video goes up to 40. Video can be paused to suit grade level expectation. However, it can be used entirely for learners who need a challenge.

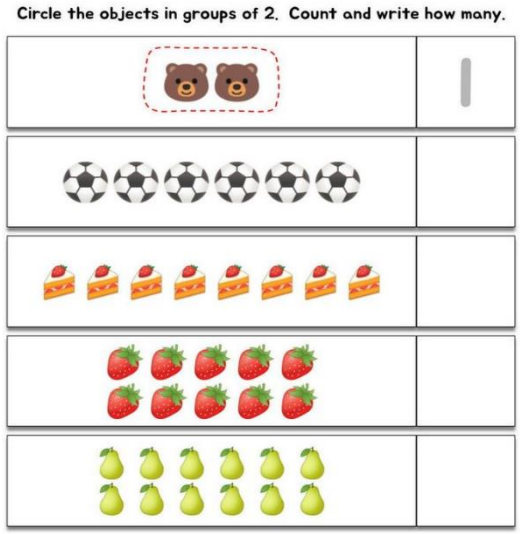
Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		• Count the number of items represented in the picture. Learners skip count to find the total of each grouping shown on their worksheet.

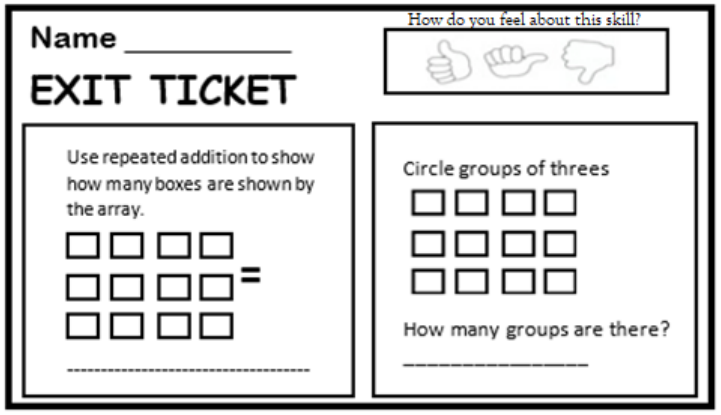



Multiplication Groups
Name: _____ Class: _____
Look at the pictures and complete the multiplication sentences
1)
There are _____ groups of carrots.
There are _____ carrots in each group.
There are _____ carrots altogether.
2)
There are _____ groups of apples.
There are _____ apples in each group.
There are _____ apples altogether.
3)
There are _____ groups of bananas.
There are _____ bananas in each group.
There are _____ bananas altogether.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		• In small groups, learners use objects to form arrays, e.g. Ask learners to make 3 groups of 4. Learners first place 3 objects in a row and then fill each row with 3 additional objects until there are 3 rows with 4 objects each.  Learners skip count the total number of objects and then write a mathematical statement to represent the array; 4+4+4=12, three groups of 4 make 12. • In a musical chairs fashion, the teacher will roll a die and call out the number in which students are to group themselves before the music ends; e.g. If the teacher says "4s", the music starts and students will form groups of 4. Any student who is not part of a group when the music ends will be out of the game. At the end of each grouping task, the students are to count the number of students in their group, the number of groups in the class and the total.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		• Place learners in pairs and give them an even number of items. Allow pairs to discover how many ways these items can be shared equally between them, e.g. 20 items can be shared in 2s, 4s, 5s and 10s. Learners fill out cards similar to these for each equal group that they make.  Solve problems in which the size of the group is unknown to illustrate fair-sharing or *partition division* problems. The whole is shared or distributed among a known number of groups to determine the size of each. Provided opportunities for students to work with problems where the number of groups is unknown but the size of the equal group is known, the problems to make the connection of division with repeated-*subtraction* problems. For example: John has 20 apples. He wants to give equal shares of them to his 4 friends. How many apples will each friend receive? Or

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		John has 2O apples. He put them into bags containing 5 apples each. How many bags did John use? . ● Assist learners to write mathematical statements to represent the 'division' e.g. 20 counters shared into 5s give 4 groups. ● Give students activity sheets to complete such as the one shown in the picture below. Observe as students circle groups of items equally then write the total number of groups in each case.  Assist learners to write mathematical statements to describe what is shown in each instance. Learners first count the total number of items then say how many groups were formed

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		when these items were shared accordingly; e.g. 2 bears shared into 2s is 1 group. 

Useful Content Knowledge for the Teacher About the Outcome:

- Repeated addition is adding equal groups together, which is the same as the multiplication.
- Division is an operation by which you separate into equal groups or find the number of equal groups.
- A multiplication array is an arrangement of rows or columns that matches a multiplication equation. You can make arrays out of objects or pictures.
- For this level, it is not necessary to use the multiplication or division signs.

Inclusive Resources and Materials from Regional Specialists:

- Edible or non-edible manipulatives (blocks, counters, beads, cereal, skittles etc.)
- Worksheets
- Laptop, projector, speakers, wifi

Additional Resources and Materials:

- Show Equal Groups with Repeated Addition
- Multiplication as Repeated Addition
- **https://www.mathplayground.com**

Opportunities for Subject Integration:

- Science: grouping foods, flowers etc.
- Arts and Crafts: creating a multiplication array of concrete objects on manila sheet

Elements from Local Culture:

Local manipulatives (use local objects that students are familiar with for groupings e.g. local foods/confectionary, seed, coins)

Resources for a learner who is struggling:

- Worksheets with simple examples
- Manipulatives up to 10 for groupings
- Youtube videos with simple language

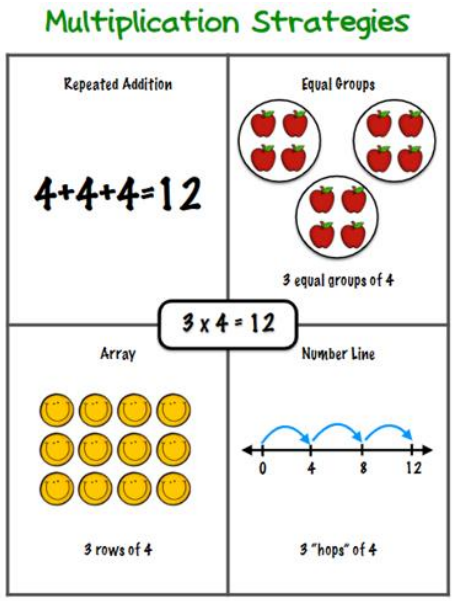
Resources for a learner who needs challenge:

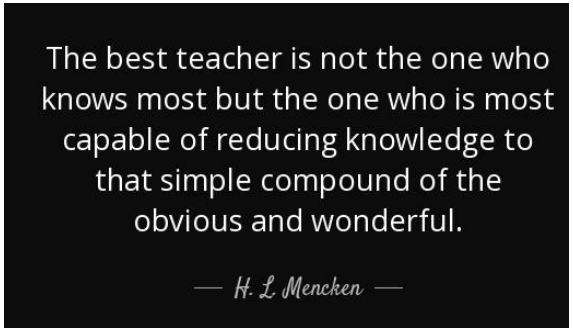
- Challenging worksheets (more examples, larger groups)
- Introduce simple word problems with a multiplicative context
- Manipulatives exceeding 20 for groupings
- Challenging online games
- https://youtu.be/dpFOvoiYDaQ (used entirely for learners who need a challenge)

Strategies that Support the Curriculum and Assessment Framework

Elements that are integrated across subjects:

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





Introduction to the Subject: *Whole numbers are numbers exclusive of any fractions, negatives or decimals. Whole numbers can be created from a combination of basic numbers and zero (basic numbers are 1,2,3,4,5,6,7,8,9). The need for students to be able to use counting and grouping strategies is important as it helps to develop confidence in students and encourages the flexible thinking needed for comprehending and creating relationships between numerals and quantities.*
Strand (Topic): Pattern and Relationships
Essential Learning Outcomes: 1.1: Recognizing, Describing and Extending Patterns - Describe, create, extend and generalise patterns
Grade One Level Expectations: Create and extend simple repeating patterns (2 elements); copy a given repeating pattern; extend a variety of given repeating patterns to two more repetitions, create a repeating pattern using manipulatives, musical instruments, or actions, and identify and describe a repeating pattern in the classroom, the school, and outdoors.

<table>
<tr><th>Specific Curriculum Outcomes:</th><th>Inclusive Assessment Strategies:</th><th>Inclusive Learning Strategies:</th></tr>
<tr>
<td>Learners will be expected to:
1. Describe, copy and extend a repeating pattern with 2 to 4 elements (using manipulatives, diagrams, body movements/actions /sounds)

2. Translate a repeating pattern from one representation or modality to another (E.g., a repeating orientation pattern</td>
<td>Observation and Discussion:
Teacher will observe by listening to students as they discuss the contents of the video and engage in reproducing the pattern embedded in the video. The checklist below will record the identified behaviors.

<table>
<tr><th rowspan="2">Learner</th><th rowspan="2">Success indicators
AB patterns</th><th colspan="2">AB Pattern</th><th rowspan="2">Other Remarks</th></tr>
<tr><th>Yes</th><th>No</th></tr>
<tr><td></td><td>Can call out the elements in the pattern in the order that they appear (left to right/right to left)</td><td></td><td></td><td></td></tr>
<tr><td></td><td>Can reproduce a pattern</td><td></td><td></td><td></td></tr>
<tr><td></td><td>Predict the missing elements in the pattern</td><td></td><td></td><td></td></tr>
</table>
</td>
<td>

Allow learners to listen/view and participate in a pattern song https://rb.gy/fc8q. At the end of the video, pose questions at various cognitive levels to help learners recall, describe/explain, reproduce and extend the pattern that was presented in the video. Example: What did you observe about the cars in the video? How do you call what you observed?
In pairs, learners use their cut-outs or cars to demonstrate their solutions to questions being asked. Can you use your cut-outs/cars and arrange your cars in the order that they appeared in the video? Which car came in first? Which car came in after the red car? Look at the

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

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:

to a repeating sound pattern, etc.)

3. Spot and correct errors in a repeating pattern.

4. Identify and describe repeating patterns in the environment (both man-made and nature)

Values:

1. Show appreciation for their peers' creation of patterns and patterns in our environment by identifying and describing the pattern observed. around them

2. Identify and enjoy patterns in poems, stories, (folk and

	Identify the pattern core at any point in the pattern Or Show the part that keeps repeating in the pattern			
	Describe a pattern			
	Create a pattern			

Think pair-share (Exploring Patterns)
Provide opportunities to explore, create and talk about repeating patterns with two, three, and four-element cores **progressively**. E.g. in pairs or small groups inspire/guide learners to rotate the different activity centers to create patterns and share their creations with their partner/group members. Inspire learners to create different patterns with different elements in the core.

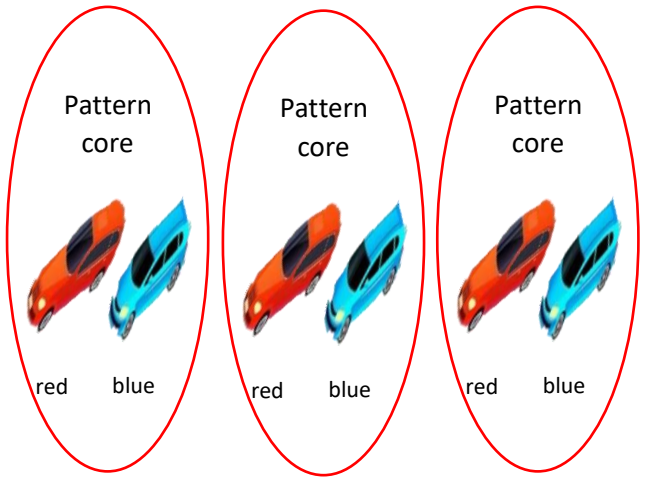
Observe learners as they construct their patterns. Ask questions at various cognitive levels to help learners conceptualize the characteristics of a repeating pattern.

Listen to learners as they respond to check for their conceptual understanding.

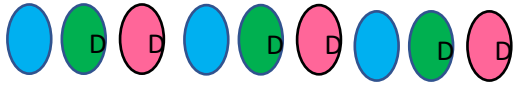
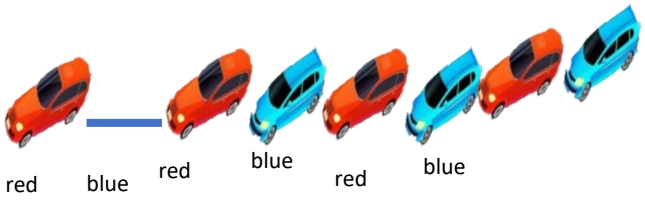
Pay attention to their use of repeating pattern terminology.

Make use of an observational checklist to check and take note of misconceptions that the learners may have and to assess their conceptual and procedural understanding of repeating patterns.

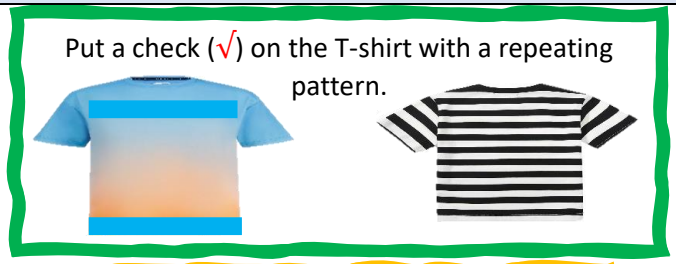
arrangements of the cars. Which car do you think will come next?

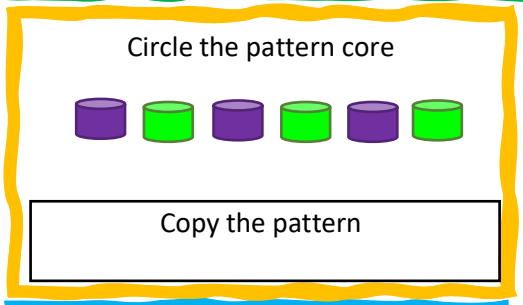


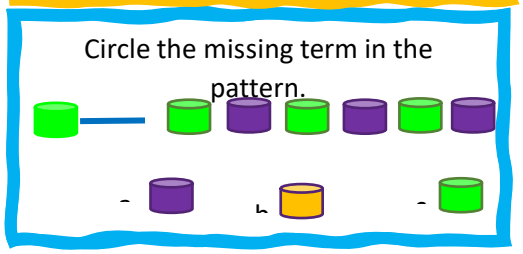
- Look at the pattern core. Each car is called a term. How many **terms** are in the **pattern core?** How many terms were used to make up the whole pattern? The pattern core tells the rule of the pattern. Which car comes first? Which car comes next in the pattern core. Can you tell me the rule of the pattern?

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
modern) within their culture.	For example, Colour pattern 3 element -core Changing attribute - colour  shape pattern 3 element - core Changing attribute - shape  Colour pattern 4 element -core changing attribute – size and colour  **Independent Practice** Allow learners to complete the task cards to demonstrate their understanding of a repeating pattern. For example,	• Can you follow the rule and make the pattern longer? Use your cut-outs and add a pattern core to the pattern. Can you find another way to extend the pattern? We can extend a pattern from any direction, once it has a fixed pattern. • Can you tell me which car is missing? How did you know?  • Give learners the opportunity to create their own patterns using a variety of materials in different forms and contexts using the ABABAB (2 elements in the core), ABCABCABC (3 elements in the core) formats. For example *Manipulative center* | **Art center** | **Music center** | **Physical education**

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:







Checklist and Think Pair Share:
In pairs, learners will select materials from the stations presented to them. A pattern will be created and presented to the class with explanations directed at why it is a pattern, how it can be extended with a focus on vocabulary enrichment.

Learner(s):	Yes	No	Comments

Leaves Sticks Pebbles Stones Sea shells Building blocks Toys including soft toys	Water, paint drawing materials sponges Leaves, Different Slices of plantains / potatoes Cotton buds	Tins bottle spoons, wooden sticks pebbles shak-shak (homemade rattles)	Students own Body movements Pictures of different body movements

- As learners create their patterns, pose questions to help them think about the characteristics of a repeating pattern. For example, ask: Can you show me your pattern core/what is the rule of your pattern? How many elements/terms make up your pattern core? How are you sure that you have a pattern? How many times did you repeat your pattern core? Can you extend your pattern a little more? Can you add another core to the front? If I take off (physically pull out the element) one of your elements, will you know which one is missing? How did you know? Can you make a pattern with different colors? Size? Shapes, a mixture of materials?

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:

Selects own materials unassisted by teacher			
Selects a pattern format (ABABAB or ABCABCABC)			
Demonstrates an understanding of the pattern format with materials selected			
Explains confidently the pattern using the correct terminology			
Worked cooperatively during the activity			
Enjoyed the process in creating their product			

- Provide opportunities for learners to work with patterns which contains up to four element cores (ABCD ABCD ABCD format)

Translating repeating patterns

- Gather the children around a physical circle. Make available a collection of different types of materials., including writing materials and things that can be used as musical instruments. Direct the learner's attention to the repeating AB letter pattern on a piece of cardboard in the center of the circle. As learners reproduce the pattern, allow them to place their patterns in the center of the circle to match the AB letter pattern. Give learners opportunities to demonstrate sound and movement patterns that match the AB letter pattern in the center of the circle.

- Ask thought-provoking questions to lead learners to see that: We can change the attributes of a pattern without changing its structure. When we translate a pattern, we change the attributes from one form to another but the structure/letter core remains the same.

<table>
<tr><th>Specific Curriculum Outcomes:</th><th>Inclusive Assessment Strategies:</th><th>Inclusive Learning Strategies:</th></tr>
<tr>
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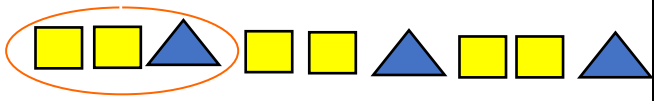
<td>
Talking Circles (translating repeating patterns)

As students explore the patterns, change attributes and engage in translating them in circles, they will discuss their observations and share with each other. They will use actions, letters, and physical objects to create those repeating patterns. Teacher will observe and record student observable behaviours using an observation checklist.
<table>
<tr><th></th><th>Needs Intervention</th><th>Not yet approaching mastery</th><th>Approaching Mastery</th><th>Mastery</th></tr>
<tr><td>Learner can</td><td>Carries out the task with assistance from the teacher for translating repeating patterns</td><td>Carries out the task independently with 3 or more errors, and/or omissions for translating repeating patterns</td><td>Carries out the task independently with less than 3 errors, and/or omissions for translating repeating patterns</td><td>Carries out the task accurately for translating repeating patterns</td></tr>
<tr><td>correctly translates a</td><td></td><td></td><td></td><td></td></tr>
</table>
</td>
<td>
Provides opportunities for learners to create and translate patterns from one form/mode to another. For example,
Body parts to words

Foot foot hand foot foot

Action to shapes
Make the actions
stump stump snap stump stump snap stump stump snap



Letters to objects/shapes
</td>
</tr>
</table>

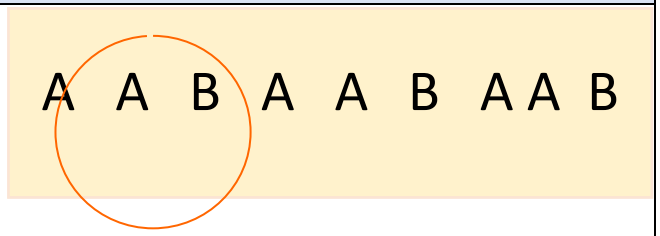
Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:

repeating pattern with 2 to four element core from one form to another				
Describes/ explains a pattern or pattern core/rule using the correct terminology for translating repeating patterns with 2 to 4-element cores.				

Observation: Choral Singing/ Chanting

Students will have a choral singing/chanting exercise where one group will begin singing or chanting the pattern (example ABCABCABC) and the other group will respond/translate by saying/singing their select pattern (example hop jump skip hop jump skip hop jump skip). This will be done with a few pattern examples following the formats ABABAB, AABAABAAB etc. Teacher will observe students' chants to ensure that they have understood the translation of patterns. The checklist above can be used to assess the translation behavior demonstrated by the learner.

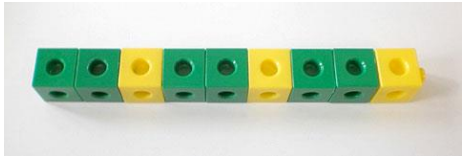
Think-Pair Share (spot and correct errors in patterns)



Error Pattern (ABCABCABC): Robocop

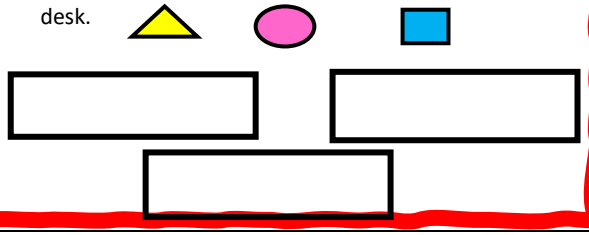
- Invite learners to take on the role of Robocop but their main job is to spot errors that have been made in the creation of patterns and correct them. Present a sequence of objects, drawings or pictures to pairs/small group of learners.

- Allow learners to study the arrangement of the objects then **ask:** What do you observe



about the arrangements of the objects? Does it show a pattern? How do you know? Can

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Let learners put on their Robocop hats (prepare beforehand) before they begin the activity. Ask probing questions to help learners think about the characteristics of a repeating pattern. In pairs, allow students to work on spotting and correcting errors in patterns presented in different contexts. Include patterns with no errors also. Give learners opportunities to share their discoveries. **Art- Border Creation** Students' work will be assessed by the teacher using any of the checklists above to ensure that they use any of the pattern formats to create their designs using items found in and around the environment. (ABABAB, ABCABCABC, AABAABAAB) OR Create their borders using the 3 shapes given, using any of the formats and an observation checklist will be used to assess their products.	you describe the rule of the pattern? How many terms are there in the pattern core? Are all the elements in the pattern following the rule? Is there any object that does not belong? Was any term in the pattern left out? Encourage learners to think about the answers and share their thinking with their partners. Then together with their partner, decide what should be done to correct the error and make the correction. Provide opportunities for learners to share their ideas with the class. • Students will be given the opportunity to create border patterns of their choice in groups with 2- 4 elements in the core, for their desks using items found in the environment. Students will source the items from home to create those patterns. OR • Learners will be given 3 shapes as seen below and create borders as the instructions state.

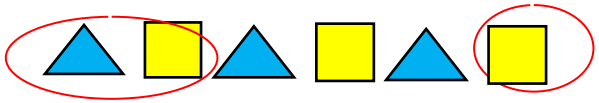
Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		 Mrs. James wants the children to use all the shapes below to make boarders for the desks. Mr. James wants the shapes to be arranged differently for each desk. 

Vocabulary:

repeating pattern core elements describe explain extend translate error color size shape direction in front before after next in front behind between

Useful Content Knowledge for the Teacher about the Outcome:

Any arrangement (objects, movements, sounds, events etc.) that follows a specific order based on a specified rule is known as a pattern. Patterns that repeat over and over and over following a specific rule is known as a repeating pattern. A repeating pattern has two main parts. These are the core and the term.



core 1 term

In the pattern above the core is a triangle followed by a square, hence the number of terms/elements in the core is two. The changing attributes are shape and colour (blue triangle, yellow square). The structure of the pattern can be described as AB. Hence, the pattern can be called an AB repeating shape pattern.

NB: It can be very difficult/impossible especially for children, to identify a pattern from a short string. Therefore, the pattern core should have at least three repeats in other for a pattern to be seen or understood.
Patterns can be extended in both directions.

Inclusive Resources and Materials from Regional Specialists (*texts, family &community knowledge and resources, contextually relevant professional web resources*)

Additional Resources and Materials
Make use of Repeating patterns, story books, poems.
songs/videos
https://rb.gy/fc8q
https://www.youtube.com/watch?v=sSi3EDw0fuI

Opportunities for Subject Integration: *(How the inclusive learning strategies might be adapted and/or applied to include other subjects in the cu*

The following are some of the areas/ways in which the concept of Patterns and Relationships, Repeating patterns can be reinforced.

English Language Arts: learners can select or be given 2 to 4 words to form a pattern core then use these words to write simple songs/poems.
ss an idea or point of view

Physical Education/Music: use the concept of repeating patterns to choreograph song verses. These short series of dance steps can be used as warm-ups in physical education classes.

Art/show: Repeating Pattern Galore to showcase learners' creation of patterns in all forms. Invite students of other classes and parents.
Social Studies Project: Patterns in our environment: Compilation of a book of repeating patterns. Developing a pattern wall in the class. Invite parents to be part of the project

Elements from Local Culture: *(References that learners might know from their local environment)* Patterns can be identified with folk dances and songs. For example, Folk Dances: quadrille, be'le' debot, moulala, etc Folk songs: *chanté kont*, traditionally sang at funeral and wakes. Festivals: La Rose and La Marguerite
Items of Inspiration (teaching tips, inspirational passages, connections to educational research): https://www.youtube.com/watch?v=qIah3CyY1F0

Patterns and Relationships

Introduction to the Subject: Logical patterns exist in and around us in the environment and it is a regular occurrence in many Mathematics concepts. Patterns can be recognized, extended and generalizations are formed using words and symbols based on observations. The same pattern can be replicated/translated/represented using different formats, using numbers, geometric representations as well as physical resources. For learners of grade one, patterning activities should involve opportunities for manipulating physical resources. This clearly allows them to extend, create patterns and make changes as they engage in the activities with a feeling of accomplishment. Moreover, the use of physical items creates a hands-on approach for students and encourages trial and error which is an important strategy in Mathematics. Patterns are observed in multiple areas; singing, writing, poetry, story-telling, the observed environment. Therefore, opportunities for developing the concept of patterns should be presented to students whereby their senses are stimulated and every learner has an opportunity to succeed through dance (body movements), singing, piecing physical materials together; ultimately catering to students at the concrete level so that full concept formation takes place.
Strand (Topic): Pattern and Relationships
Essential Learning Outcome: 1.2: Learners will recognize, describe and extend for increasing and decreasing patterns
Grade One Level Expectations: Create and extend simple growing patterns. Can explain what they are doing and why; e.g. can use counters to build a pattern that grows by 1 or 2 each time**.**
Key skills: counting, pattern searching, representing, analyzing, interpreting, drawing, problem solving, reasoning, creating, predicting.
Concepts: elements, growing pattern, sequence, order, term

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

Learners will be expected to:

- **Interpret, describe and extend a given increasing and decreasing pattern that grows by 1 or 2 each time with no more than 4 elements in the core.**
- **Use a variety of tools and models to create, generate and interpret patterns that increase or decrease by 1 or 2 each time (blocks, pattern strips, pattern blocks, etc.)**
- **Identify missing elements and/or errors in a given increasing and decreasing pattern.**
- **Show an appreciation for patterns found in the environment around them by recognizing, talking about, describing and recreating their own examples based on observations.**

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<u>Product-Role Play and Think, Pair, Share</u>:

Learners in pairs will discuss and create their own increasing pattern to reflect body movements and share with the class their creations (e.g. clap, stomp, stomp, clap, stomp, stomp, clap, stomp, stomp,…shake your body, nod your head twice (repeat 3 times). Demonstration of the repeating pattern will be observed by the teacher and recorded for understanding using an observation chart for each pair of students.

<table>
<tr><th>Learner(s)</th><th>Yes</th><th>No</th><th>Needs Practice</th></tr>
<tr><td>Created and demonstrated a repeating pattern using the ABBABBABB pattern</td><td></td><td></td><td></td></tr>
<tr><td>Presented and explained their pattern thinking process, using content vocabulary such as next, pattern, after, etc.</td><td></td><td></td><td></td></tr>
<tr><td>Had fun while engaging in the pattern creation process</td><td></td><td></td><td></td></tr>
</table>

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<td>

Repeating pattern:

Learners will listen to a chant by the teacher and demonstrate the body movements to reflect a given increasing pattern by one each time,(ABBABBABB) using physical movements, steps, hand movements or full body movements e.g. up down down, up down down, up down down.

A B B A B B A B B

The pattern will be chanted again and students will listen and demonstrate the actions.

Students will then be asked the following guiding questions to reflect on:

- *What did you notice while you were doing the actions?*
- *Can you tell me what action we should do next?*
- *Are you sure this is what comes next? Why?*
- *Can you continue the pattern?*
- *Can you describe the pattern? Can you identify what is being repeated? (element, core)*

Increasing pattern:

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

Engage learners in a discussion on what they are observing in the given sequence using the coloured blocks and/or bottle caps. Behaviours will be recorded using an observation checklist. In pairs, students will then create a sequence of their own reflecting the ABABBABBB pattern and share with their peers when completed. Students' progress will be monitored by the teacher as they engage in the activity.

<table>
<tr><th>Learner</th><th>Yes</th><th>No</th><th>Comments</th></tr>
<tr><td>Can identify a pattern in a given sequence</td><td></td><td></td><td></td></tr>
<tr><td>Is able to explain the pattern in the demonstrated sequence</td><td></td><td></td><td></td></tr>
<tr><td>Is able to extend the continuing pattern within the sequence with at least 2 to 3 elements</td><td></td><td></td><td></td></tr>
<tr><td>Is able to explain their reason for selecting the continued pattern in the given sequence</td><td></td><td></td><td></td></tr>
<tr><td>Uses appropriate vocabulary</td><td></td><td></td><td></td></tr>
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<td>

The learners will be presented with a sequence made out of blocks, bottle caps or any physical objects to observe a given increasing pattern (ABABBABBB). First a discussion will follow to answer the following:

- What do you notice?
- Is there a pattern? Is there anything alike/similar?
- Do you think you can continue the pattern?
- What comes next? Why?

After students have extended the pattern they will now create a sequence reflecting a pattern of their own using physical coloured blocks, bottle caps, emoticons or any physical objects as illustrated below using the format (ABABBABBB)

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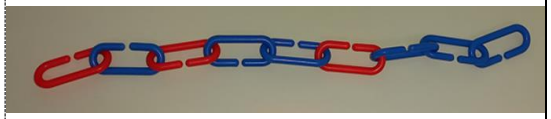
</table>

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:

associated with patterns (next, after, beside, sequence, pattern)			
Able to create a a sequence reflecting the pattern ABABBABBB in pairs.			

Product:

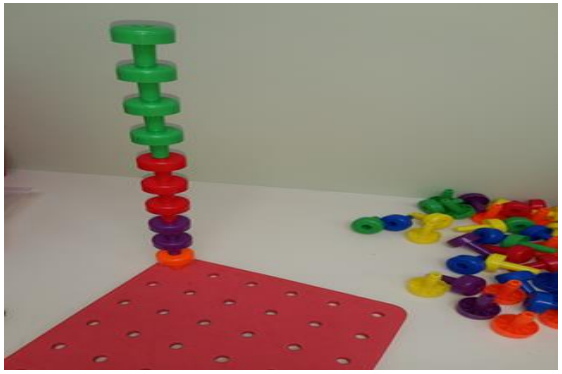
As the story is read, guiding questions will be asked based on patterns observed such as; How many buttons do you think will be on the third shirt, 4th shirt, 5th shirt? Attention will be paid to the use of the vocabulary associated with increasing patterns (next, one more than, more). Observable behaviours will be noted, such as students' ability to reproduce the pattern using different modes of representations (play dough, using blocks, drawings, or any manipulative to depict the increase in the sequence) as reflected by the story.

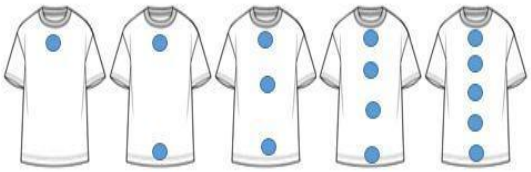
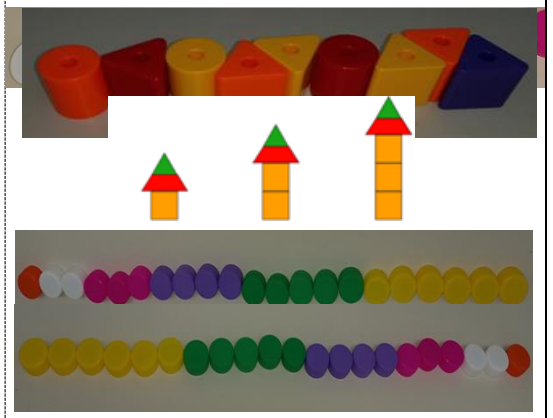


A B A B B A B B B

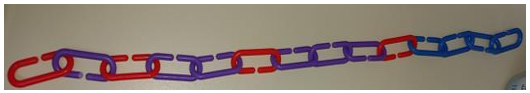
Increasing Pattern:

Learners will listen to a story about **Peter's Missing Buttons** which reflects increasing patterns by one: Have you ever

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 **Self- Assessment Faces:** Students' ability to demonstrate their understanding of an increasing or decreasing pattern using objects of their choice such as patterned sponges, leaves or any item found in the environment, will be observed by the teacher and students will use a self assessment to determine how they felt about completing the task below:   	picked up your school shirt and noticed buttons were missing? Today we will listen to a story about a boy who needed a shirt for school and needed to choose the best shirt to wear. **Story:** *Peter went to his wardrobe to get his school shirt this morning, He pulled out a shirt and it had only one button, he pulled out another and it had 2 buttons, another shirt, 3 buttons. Oh, mom would be angry today! Can you guess how many buttons the next shirt might have? Yes, 4 buttons! Peter was getting tired of pulling out shirts. One more time and that is it! One more shirt and finally he got his 5 button shirt. He was happy and ran off to the shower to get ready for school.'* After listening to the story, a discussion will follow and students will draw, use objects representing the 5 shirts based on what was heard within the story. They will explain the patterns observed in the story. An extension to the story can be added: If Peter had pulled out shirt number 10, how many buttons do you think it would have?

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	I've got it **I am struggling but learning** **I need some help** **Student Self- Assessment Checklist for Error Analysis in Sequence** Students will complete a self -assessment checklist as they analyse the sequences with errors given. The teacher will also be monitoring the observable behaviours of students as they complete the task. For students who have challenges reading, they will be given assistive devices. or a peer to work with. ☐ I can identify the pattern in the sequence. ☐ I can spot the error and say what it is ☐ I can fix the error. ☐ I can extend the sequence	 Draw, paint, create an increasing or decreasing pattern by 1 or 2 elements, using patterned sponges or leaves or items found in the environment or demonstrate growing/ increasing/ decreasing patterns by using cut outs, bottle caps, blocks or cubes. 

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		Error Analysis Present students with a few patterned sequences. They will analyze the sequences to determine whether the patterns presented follow a given sequence. They will spot the errors and give their reasons why an error exists and determine what needs to be changed or adjusted in the sequence, through guided questions such as: ❖ Is there a pattern? ❖ What pattern do you see? ❖ Does the pattern continue in a sequence? ❖ Can you identify the element that is missing or needs to be removed? ❖ Can you fix the error? Extend the pattern. (students who are struggling with extending the sequence will be given manipulatives to complete the task. Examples below: 

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		

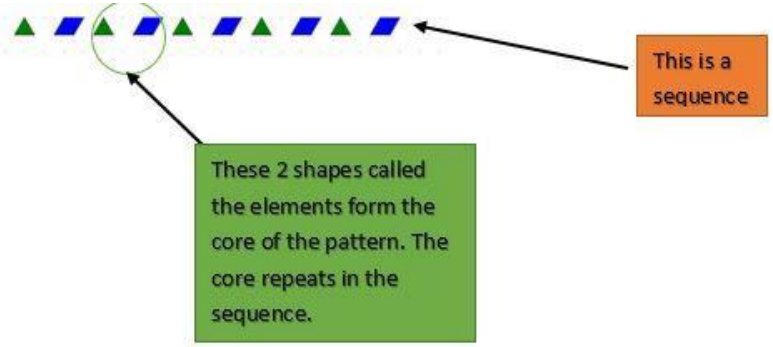
Useful Content Knowledge for the Teacher about the Outcome:

What are patterns?

A pattern is a repeated design, sequence, structure, shape, quantity. Patterns can be represented using words, letters, shapes, orientation, pictures,art, diagrams, charts, videos, songs.

Parts of a sequence

- ***sequence***: a list of things/numbers/objects that follow a particular order with a specific rule
- ***element/term***: the object(s) that form the pattern
- ***core:*** the string of elements that repeat the pattern
-

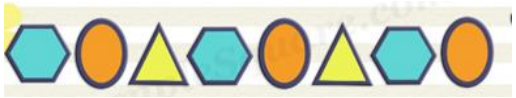


Types of patterns

Repeating Patterns

A group of elements that repeats itself as the pattern grows/extends. A repeating pattern takes the format of ABABAB eg Hi Low, Hi Low, Hi Low

ABCABCABC e.g. Jump Squat Stand, Jump Squat Stand, Jump Squat Stand,



AABAABAAB e.g. clap clap stop, clap clap stop, clap clap stop

Growing Patterns

A growing pattern is a pattern that includes something or an item every time the sequence repeats.

Examples of some patterns found in and around the environment:

Pedestrian Crossing

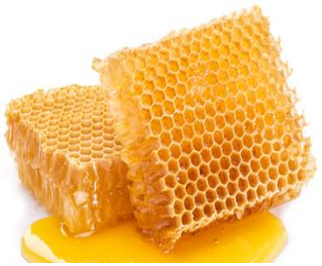
Stone formation in a wall

Floor Tiling Design

Burglar Bar Design

Caterpillar

Honey-comb

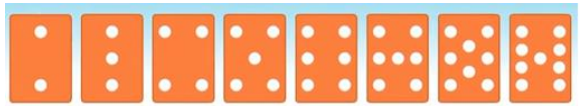


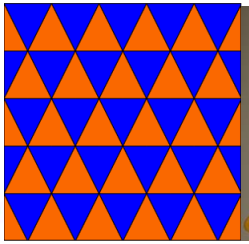
Material (madras)

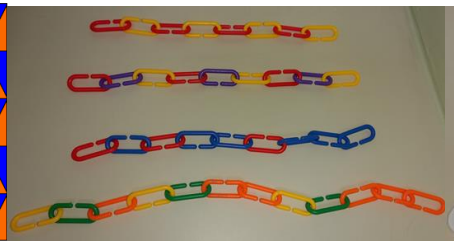
Flowers

Pineapple

Other examples of patterns using manipulatives







Inclusive Resources and Materials from Regional Specialists:

beads blocks stickers leaves shoes bags paper shapes solids/3-D Shapes sponge prints
coloured push pins coins magnetic numerals and letters buttons toy cars crayons and or coloured pencils
candy interlocking cubes number lines assorted shapes pattern strips coloured paper clips geoboard
pegboard paint sidewalk chalk candy such as M and M's and skittles Madras cloth or pieces of cloths with patterned designs
Chess or checker board Dominoes plain and coloured popsicle sticks

Additional Resources and Materials

- Story Books
  - ❖ Pattern Fish by Trudy Harris
  - ❖ Teddy Bear Patterns by Barbara Mc Grath
  - ❖ Lots and Lots of Zebra Stripes by Stephen Swinburne

- ❖ Busy Bugs: A Book About Patterns by Jayne Harvey
- ❖ A-B-A-B-A Book of Pattern Play by Brian Cleary
- ❖ National Geographic Kids Look and Learn: Patterns

- https://www.youtube.com/watch?v=wfAyddSr9_w
- https://proudtobeprimary.com/pattern-activities/
- https://www.akteacherlife.com/resource-library/

Opportunities for Subject Integration:

- **Art:** create patterns using cutouts, paint, hand or finger prints, beading, crotchet, a class rug using cut outs of cloth, items found in the environment such as leaves, stones, etc
- **Music:** listen to songs and identify patterns in the songs played or sang, create patterns based on rhythms demonstrated
- **Language Arts:** Use transitional words as well as vocabulary associated with patterns: next, before, order, etc. Identify patterns in stories read or created, patterns in poetry, read-alouds with patterns embedded in the text
- **Earth Science**: patterns in nature, e.g the formation of flowers such as the hibiscus, the pineapple, the water cycle
- **Physical Education**: body movements for exercise as well as skill development, e.g. squat, jump (repeat)

VOCABULARY: PATTERN AND RELATIONSHIP

repeating pattern colour size shape after before next sequence order rule direction

direction order position first second beside term predict

Elements from Local Culture:

- Local songs: verse, chorus, verse, chorus
- Poetry
- Planting alternate seedlings on a bed

Resources for a learner who is struggling:

- Use of verbal prompting at each stage of the activity for students
- use number pegs or a peg board for student(s) to create patterns
- Lego blocks for students needing tactile support

Resources for a learner who needs challenge:

- Patterns that extend to use of numerals
- Use of multiple colours to create other patterns
  Example.

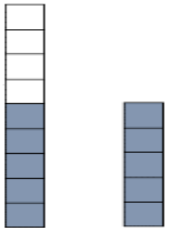
Strategies that Support the Curriculum and Assessment Framework

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):

Introduction to the Subject: As learners continue their learning through experiences with Mathematics, it is important that they develop algebraic thinking/reasoning at a very early stage. Algebraic thinking is a process and allows opportunities for learners to analyse patterns, study and represent, make generalisations, and analyse how things change. Learners make generalisations about patterns that seem similar or different, they use patterns to help recognize numbers, as they explore operations (+, —) they look for patterns to help with facts and relationships among facts. Development or promotion of learners' algebraic thinking can be done through three approaches: problem solving, generalizing and functional. Opportunities are given to young learners through activities such as analyzing parts and wholes, generalizing and doing and undoing to aid with such development. Moreover, learning algebra in the early years, primarily focuses on visual representation and problem-based context introduced first, followed by symbolic representation where learners are presented with the idea of unknowns using rectangles or dashes. Three aspects of mathematical instruction which provide a framework to recognise and develop learners' algebraic thinking are generalizations, concepts of equality and thinking with unknown quantities.
Strand (Topic): Pattern and Relationships
Essential Learning Outcome: 2.1: Variables and Relationships - Representing Unknowns
Grade One Level Expectations: Missing quantity in numbers to 20, modeling equivalence in sets and linear models, writing number sentences using the equals sign, can write open sentences (e.g. 2 + __ = 5 or __ - 3 = 7) to show what was done in additive situations (Connect to additive thinking)
Key skills: Representing Unknown

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Learners will be expected to: ❖ **Identify and describe missing quantities in numbers up to 20 by using a variety of concrete materials to represent situations.** ❖ **represent missing quantities in numbers up to 20 by writing number sentences in semantic and computational forms:** ● ***using joining, separating, part - part whole and comparing structures/ relationships*** ● ***using the inverse of the given operation***	**Observation:** Observe and check whether learners are able to represent unknown quantities from stories or situations, using concrete materials. Make observations about the math material that the learners use to show the unknown quantities. (Use a simple observational checklist: specific skill in the form of a question, yes/no) Example: Is the learner able to write a number sentence to represent unknown quantities; 1+ ___ = 4? Yes or No Sample Checklist Skill/Behaviour | Yes | No | Observations Can the learner write a number sentence to represent unknown quantities? | | | Can the learner represent unknown values using concrete materials and drawings? | | | Can the learner use part – part whole relationship to represent unknown quantities? | | | Can the learner use joining and separating to find unknown quantities? | | |	Have learners represent unknowns using concrete materials such as: connecting cubes to build towers.  Present learners with a set of connecting cubes. Ask students to build a tower of six. Afterwards ask students to build a tower of two cubes. Question students: How many more or fewer? (4 more to make 9) 9 5

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:

Can the learner use the inverse of the operation to represent and find unknown quantities?			

Think - Pair Share:

Have learners read stories/ situations about unknowns. Allow them to work in pairs and discuss representations/ solutions. Allow learners to make presentations using concrete materials or role play situations to represent unknowns.

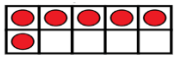
Product: Play Games

Have learners play games in small groups using "missing part cards". use number frames (5, 10 …). Each card can have a different number of dots in the frames or a specific number can be the focus.

Observe and listen as students read the cards, discuss the visible parts, represent the unknown etc.
(Model the game)

Learners can also engage in the game "I wish I had…" They will listen to, observe or read situations and then determine the representation for the unknown. Concrete materials or pictures can be used with the presentation of the situations.

Provide opportunities for learners to use materials to represent 'Part - Part Whole' relationships and to find unknown quantities. Use Number Frames (Five Frames, Ten Frames) to model unknowns. Give students the number frames with some coloured counters. Question students about the number of counters and how many more are missing to form the quantity. As students share responses, model using different coloured counters and place the missing part.



This ten-frame has 6 counters. How many more are missing to make 10?

A five frame can be used.

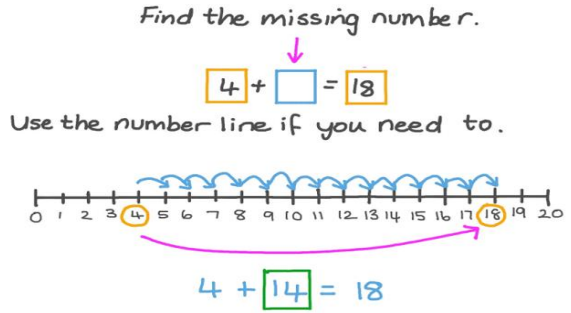
(ten frames - Google Search)

Use a box diagram or number lines as alternative strategies.

(a) Example with use of a box diagram

7	
3	?

(b) Example with use of a numberline

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Product: Exit Cards Distribute cards to learners and allow them to write/ complete number sentences to represent unknowns from situations read to them. **Or** Distribute cards and allow students to write their own stories/ situations for representing unknowns and complete them. Collect cards or allow students to place them up in specific area in the classroom for the topic done.	  (number lines to show unknown numbers - Google Search) Allow learners the opportunities to write the number sentences after studying pictorial representations of situations, listening to or reading stories/situations. Provide a variety of situations relating to the join, separate, part - part whole and comparing problem structures.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		Example: ***Sam has 8 sweets. Gina gave him some more. Sam now has 10 sweets. How many sweets did Gina give to Sam?*** **8 + ____ = 10** ***Sam has some sweets. Gina gave him 2 sweets. Sam now has 10 sweets. How many sweets did Sam have at first?*** **____ + 2 = 10** Use Mental Starters: Relate situations to students where they will use manipulatives or drawings to represent situations. Upon introduction, the teacher may model to students and explain using concrete materials. Example: ***I think of a number. I added 3, I now have 7. What number did I think of?*** ***My number is 8. I subtract a certain number from it, I now have 4. What number did I subtract?***

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		Provide opportunities for learners to represent the unknown using joining and separating situations using drawings/pictures. Example: 4 + 3 = _____  4 - ____ = 3 ____ - 1 = 3  Let learners find unknown quantities using the inverse of the operation. Learners can use concrete materials, pictorial representations to help with solutions. Example: **5 + ___ = 6** **6 - 5 = ____** **____ - 3 = 4** **4 + 3 = ____**

Useful Content Knowledge for the Teacher about the Outcome:
Addition and Subtraction are inverse operations of each other or in other words they are opposites.

Addition undoes Subtraction and Subtraction undoes Addition. Example: 5 + 2 = 7, 7 - 5 = 2, 7 - 2 = 5

Commutative Property: The commutative law for addition states that regardless of the order of the two numbers which are added, the total is the same. Example: 2 + 3 = 5, 3 + 2 = 5

Fact Family: Example: 4 + 5 = 9 9 - 4 = 5
5 + 4 = 9 9 - 5 = 4

Unknown quantities can be found by the learner using situations for joining, separating, part - part whole and comparing structures.
Examples of situations for Addition and Subtraction:

	Result Unknown	**Change Unknown**	**Start Unknown**
(Add to) Joining	Five birds were sitting on a branch. Three more birds came to sit on the same branch. How many birds are on the branch now? 5 + 3 = ____	Five birds were sitting on a branch. Some more birds came to sit on the same branch. There are eight birds on the branch now. How many birds came to sit on the branch? 5 + ____ = 8	Some birds were on the branch. Three more birds came to sit on the same branch. There are eight birds in all on the branch. How many birds were on the branch before? ____+ 3 = 8
(Take from) Separating	There were nine mangoes in the basket. Mother ate four mangoes. How many mangoes are left in the basket? 9 - 4 = ____	Nine mangoes were in the basket. Mother ate some of the mangoes. Now, there are five mangoes left in the basket. How many mangoes did Mother eat? 9 - ___ = 5	There were some mangoes in a basket. Mother ate four of the mangoes. Now there are five mangoes left. How many mangoes were in the basket before? ____ - 4 = 5
	Total Unknown	**Addend Unknown**	**Both Addends Unknown**
(Put Together/ Take Apart) Part - Part Whole	Six red apples and four green apples are on the tree. How many apples are on the tree? 6 + 4 = _____	Ten apples are on the tree. Six of the apples are red and the rest are green. How many apples are green? 6 + ____ = 10 10 - 6 = _____	There are six apples on the tree. How many apples can be red? How many apples can be green? 6 = 0 + 6 6 = 0 + 6 6 = 1 + 5 6 = 5 + 1 6 = 2 + 4 6 = 4 + 2 6 = 3 + 3
	Difference Unknown	**Larger Unknown**	**Smaller Unknown**

Compare	Jon has four pencils. Kim has six pencils. How many more pencils does Kim have than Jon? Jon has four pencils. Kim has six pencils. How many fewer pencils does Jon have than Kim? 4 + ____ = 6 6 - 4 = ____	Kim has two more pencils than Jon. Jon has four pencils. How many pencils does Kim have? Jon has two fewer pencils than Kim. Jon has four pencils. How many pencils does Kim have? 2 + 4 = _____ 4 + 2 = _____	Kim has two more pencils than Jon. Kim has six pencils. How many pencils does Jon have? Jon has two fewer pencils than Kim. Kim has six pencils. How many pencils does Jon have? 6 - 2 = _____ ____ + 2 = 6

Use appropriate questioning techniques or prompts to guide or extend learners thinking:

- Tell me what you were thinking…
- Did you or can you solve this in a different way?
- How do you know it's true?
- Does it always work?

The equal sign means "the same as" not the answer is. This is a common misconception introduced at a very early stage.

Problem solving strategies include discussing the problem and role play (act it out). As learners solve problems or situations, they should not rely on key words as they have multiple meanings

Inclusive Resources and Materials from Regional Specialists:

- ❖ Number Frames - Five frames, Ten Frames (other number frames can be made)
- ❖ Number lines
- ❖ Interlocking cubes
- ❖ Concrete Materials: beads, counters, popsicle sticks, blocks, straws, seeds
- ❖ Cuisenaire rods

Additional Resources and Materials (Learner's Literature Suggestions)

- Leedy, Loreen *Missing Addition*
- Leedy, Loreen *Missing Math: A Number Mystery*
- Leedy, Loreen *Subtraction Action*
- Silverstein, Shil *The Missing Piece*

Appropriate Vocabulary

addend	sum	total	less
inverse	part/whole	more	equal (same as)
unknown	pattern	fewer	
subtract	difference	minus	

Opportunities for Subject Integration:

Language Arts:

- Reading: Stories and situations can be used as fluency reading pieces for reading activities.
- Reading Comprehension: Stories/ situations/ problems can also be used to reinforce Comprehension skills (Literal Comprehension: Who? What? As students represent the situations using drawings and pictures, this aims at students visualizing (another comprehension skill).
- Vocabulary/ Word Building: New vocabulary words can be used when creating the stories/ situations/ problems that students will encounter to help them understand or determine the meaning. Students can also learn appropriate mathematics vocabulary. (NOTE: Key words in problem solving situations have multiple meanings and it is critical not to rely on key words in problem solving)
- Writing: Students engage in writing stories/ situation/ problems: Conventions of writing are applicable such as Types of sentences: statements and questions, the specific ending marks, Capitalisation of proper nouns and at the beginning of the sentences. Writing stories of their own – include characters

Social Studies:

- Study simple graphs/ tables / charts including information about population, area, location, districts
- Collaborating and working together in groups
- Communicating with peers

General Science:

- Plant and Animals – compare sets which contain specific species, parts of a plant etc.

- Questioning techniques used in the classroom can lead to students experiencing and representing the unknown in all aspects of the curriculum.
- Other topics: Solar System, Moon Phases

Health and Family Life:

- Develop an appreciation for peers, value the contribution and ideas shared. Cooperation with peers is also encouraged through group activities.
- Cooperation and group work
- Roles and responsibilities of group members

Mathematics:

- Stories/ situations/ Problems presented in this topic can provide reinforcement for other topics in Mathematics.
  Money: Situation where an amount of money is spent from a total with an amount left. What amount was spent?
  Time: Situation that use basic time units (hours or minutes or days) where students represent unknown by writing number sentences
  Geometry: Attributes of plane shapes; number of sides total how many more are missing to complete the shape.
  Measurement: Situations of comparing linear measurements such as length, height and distance, mass and capacity

Art and Craft:

- Students can draw representations using shapes or other relevant pictures.

Elements from Local Culture:

Transportation: Students who travel by bus frequently can associate where number of passengers are missing for the bus to leave the bus stop

Shopping: Students can relate as the purchase items, being able to tell how much less they have or how much more the are missing to purchase item

Sports: Number of runs, laps, goals missing to emerge winner

Cooking: the number of cups/ teaspoons or eggs needed for a recipe, what has been used and the amount missing

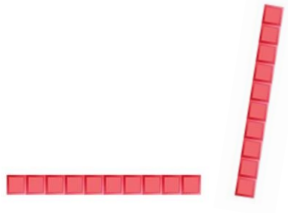
Resources for a learner who is struggling: *(Links to earlier learning activities for similar knowledge, links to resources for special education needs)*

https://www.ixl.com
www.boddlelearning.com
Ten Frame | Manipulatives | Coolmath4Kids
Photo Math
Todo Math
Time4MathFacts

Resources for a learner who needs challenge: *(Links to learning activities and resources in later grades)*

https://www.mathisfun.com
www.KhanAcademy.org
https://www.ixl.com
Quizlet
Wolfram MathWorld

Introduction to the Subject: Logical patterns exist in and around us in the environment and it is a regular occurrence in many Mathematics concepts. Patterns can be recognized, extended and generalizations are formed using words and symbols based on observations. The same pattern can be replicated/translated/represented using different formats, using numbers, geometric representations as well as physical resources. For learners of grade one, patterning activities should involve opportunities for manipulating physical resources. This clearly allows them to extend, create patterns and make changes as they engage in the activities with a feeling of accomplishment. Moreover, the use of physical items creates a hands-on approach for students and encourages trial and error which is an important strategy in Mathematics. Patterns are observed in multiple areas; singing, writing, poetry, story-telling, the observed environment. Therefore, opportunities for developing the concept of patterns should be presented to students whereby their senses are stimulated and every learner has an opportunity to succeed through dance (body movements), singing, piecing physical materials together; ultimately catering to students at the concrete level so that full concept formation takes place.
Strand (Topic): Pattern and Relationships
Essential Learning Outcome 2.2: Variables and Relationships - Understanding and representing equivalence
Grade One Level Expectations: Can show various partitions of a quantity are equivalent, can construct two equal sets or lengths, can determine if two given sets or lengths are equal and explain how they know, can record different representations of the same quantity using the equal sign (e.g. 3 + 4 = 5 + 2) as a way of recording what was built.
Key skills: counting, pattern searching, representing, analyzing, interpreting, drawing, problem solving, reasoning, creating, predicting.
Concepts: elements, growing pattern, sequence, order, term

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Learners will be expected to • **Use different number combinations and linear models to create equivalent number values and lengths up to a total of 20.** • **Identify and use equivalent relationships of equal length, number and number sentences adding up to 20.**	**Group Work** In pairs the learners create equal lengths using building blocks for given lengths given to them.  They are also given a pair of lengths that they need to make equal to each other. **Tools used to monitor the above activity**	The learners view a video on number combinations with the sum of ten and they sing along. https://youtu.be/n2Nfez2e67k?t=65 The same rhythm and melody is applied to other number combinations made for other sums. The learners classify objects based on equal lengths. For example- building blocks, strips, strings etc The learners use objects to create equal lengths. For example, String equal lengths of beads, stack equal lengths of blocks etc.

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

- **Compare lengths, number, and number sentences using the equal sign.**

</td>
<td>

<table>
<tr><th>Activity</th><th>Skills used by the Learners</th><th></th></tr>
<tr><td rowspan="2">Create lengths of building blocks that are equivalent.</td><td>Stacked the blocks one at a time keeping in mind the previous number</td><td></td></tr>
<tr><td>Stacked the blocks evenly as they created the equal lengths</td><td></td></tr>
<tr><td rowspan="2">Manipulate a pair of given lengths to make them equivalent to each other</td><td>Added blocks to the shorter length.</td><td></td></tr>
<tr><td>Removed blocks from the longer length.</td><td></td></tr>
</table>

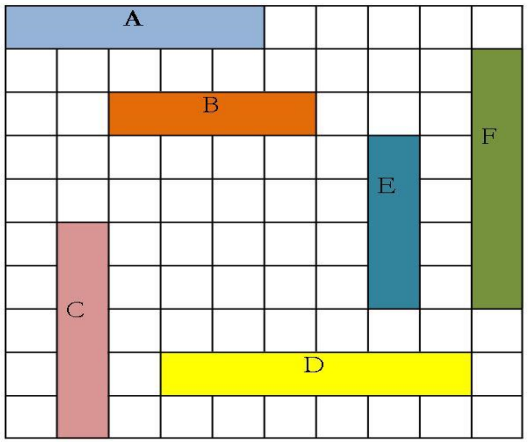
Observation using a Rubric

The following assessment tool is used to determine whether the students are able to match the equal lengths on a grid.

<table>
<tr><th>Matching equal lengths</th><th>Score</th></tr>
<tr><td>The learner identified three pairs of equal lengths</td><td>3</td></tr>
<tr><td>The learner identified 2 pairs of equal lengths</td><td>2</td></tr>
</table>

</td>
<td>

The learners match the equal lengths using the letters assigned to each length on the grid using the equal



sign.

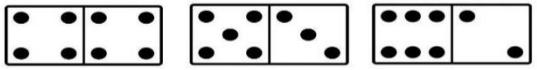
For example: D = F

The learners solve stories/problems involving equal number combinations.

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

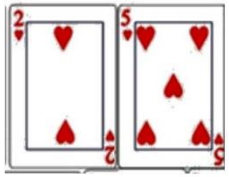
<table>
<tr><th>Specific Curriculum Outcomes:</th><th>Inclusive Assessment Strategies:</th><th>Inclusive Learning Strategies:</th></tr>
<tr>
<td></td>
<td>
<table>
<tr><td>The learner identified 1 pair of equal lengths.</td><td>1</td></tr>
<tr><td>The learner identified no equal lengths.</td><td>0</td></tr>
</table>

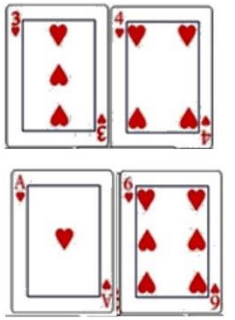
In small groups, the learners create different number combinations for a given example. They follow the illustrated pattern to explain the equivalent combinations that they have created.
For example:
 
5 and 0 make 5
 
3 and 2 make 5
 
4 and 1 make 5

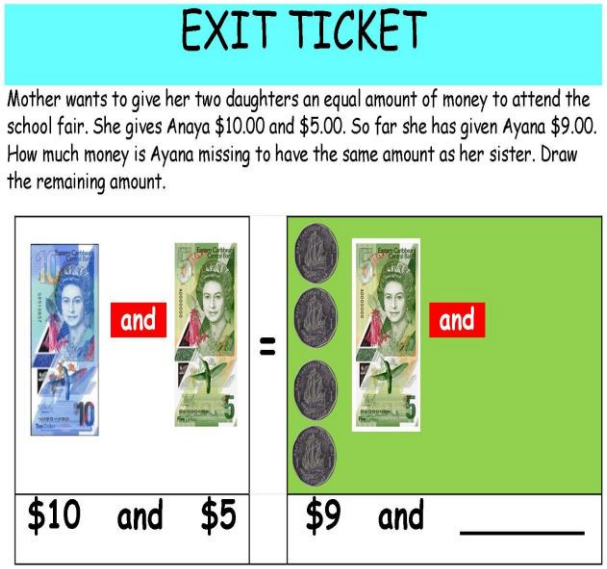
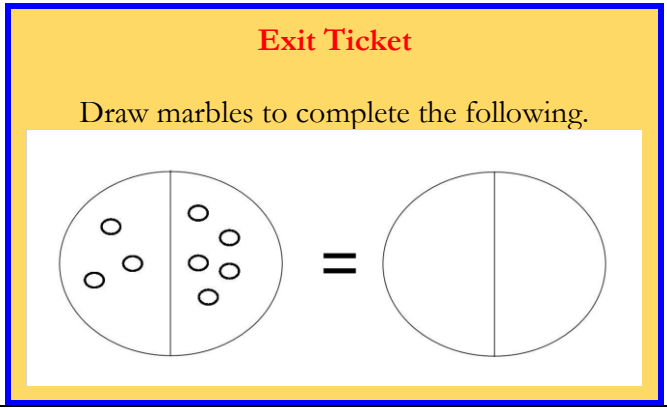
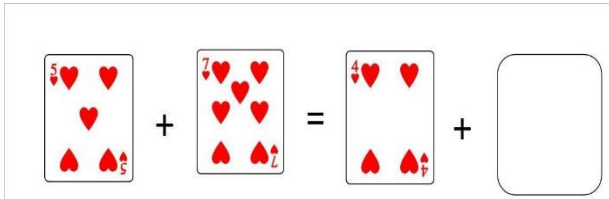
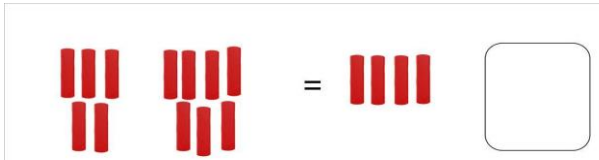
Think, pair, share
</td>
<td>


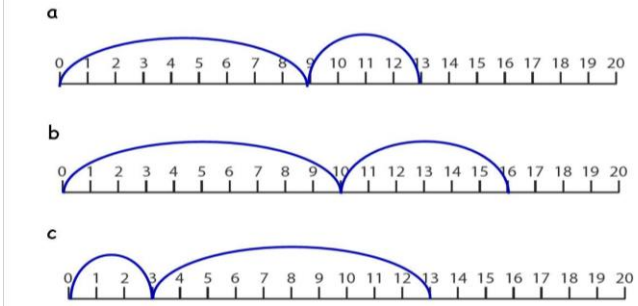
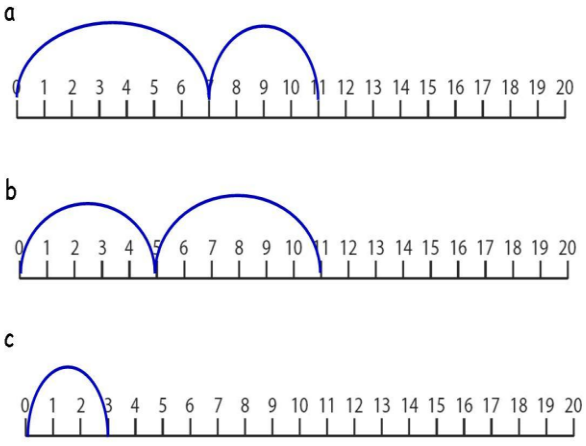
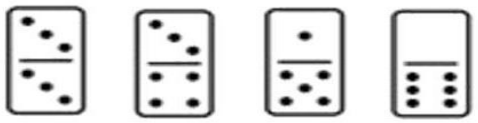
Mary needs to find all the dominoes in the case with combinations adding up to 8. Which dominoes must she take?

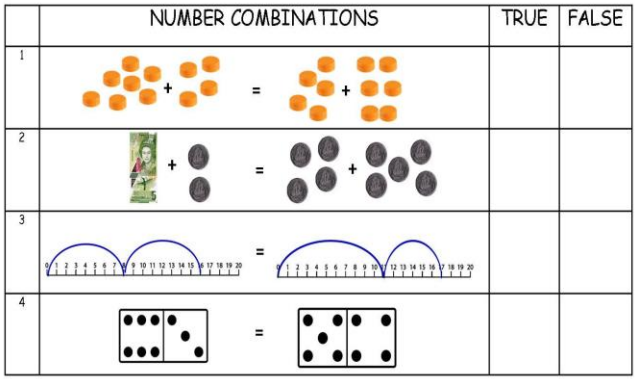
Jane has to make other equal combinations of cards of a given suit. she is given 2 of hearts and five of hearts. What combinations will Jane make?

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

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	1. The learners are asked to create other number combinations equal to a given number combination using playing cards. The learners use the guess and check method to help them make equivalent playing card combinations. For example: What other number combinations are equal to the combination shown on the cards below in the same suit?  **2.** The learners, within a minute, individually draw marbles to create equal combinations for the given one. **3**. They then in their groups, discuss and compare their responses. The use the remaining cards in the suit to create the other equal combinations. **4.** Then share their answers with the class. **NB: A similar assessment can be done using dominoes.** **Exit Cards** The learners write another combination for a given combination on a given card. For example:	Other combinations include:  Mark has 2 five-dollar notes. Sue has 1 five-dollar note and 3 one-dollar coins. How much more money does Sue need to make the two amounts equal. Complete the diagram below to make the amounts equal. 

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 	The learners complete representations to make equivalent number combinations. For e.g.   Use the number line to create equivalent combinations as shown in a and b below. Complete combinations for given combinations. For example: complete c below given a and b.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Reflection The learners compare three given number lines to identify the pair showing equal number combinations. They also discuss how they can make the number combination shown on the non example, equal to the others identified.  The learners state their reason for choosing the equal number combinations. They state the reason for not choosing the domino which does not belong to the set. The learners will analyze the following pairs of number combinations below. They check true or false to state whether the pair are equal number combinations.	 The learners are given a set of dominoes to find the odd one out. The number combination on one of the dominoes will not be equivalent to the others. For example: Which does not belong? 

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Write ✓ under true if the number combinations are equal and X under false if the number combinations are not equal.  	The learners state why the chosen domino does not belong.

Useful Content Knowledge for the Teacher about the Outcome:
https://www.mathsisfun.com/definitions/equivalent.html
https://youtu.be/epIQV8ixqoA)

Vocabulary

- number combinations
- compose
- decompose
- equal to
- sum

- **Inclusive Resources and Materials from Regional Specialists** (*texts, family &community knowledge and resources, contextually relevant professional web resources*)
  playing cards
  dominoes
  counters

beads
string
strips
building blocks
number cards
number line worksheets
Video- https://youtu.be/n2Nfez2e67k?t=65

Additional Resources and Materials
https://youtu.be/G05AgnEGmgw

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

- **Language Arts**
  Write and discuss reasoning for selecting and creating equivalent combinations.
  Write mathematics stories or word problems relating to finding equivalent combinations.
  Read stories relating to equivalence and discuss their understanding.
- **Art**
  Represent their understanding of Mathematics stories or word problems as a drawing
- **Music**
  Students sing songs and create their own rhythms and melodies for equivalent number combinations.

Elements from Local Culture: *(References that learners might know from their local environment*

- Bottle caps
- Playing cards
- Dominoes
- popsicle sticks

Resources for a learner who is struggling: *(Links to earlier learning activities for similar knowledge, links to resources for special education needs)*

- pegged mats with pegs
- big lego blocks

Resources for a learner who needs challenge: *(Links to learning activities and resources in later grades)*
https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.liveworksheets.com%2Fok2591971jn&psig=AOvVaw2-A3EZsluqwxdOsKHAJqHj&ust=1681288081910000&source=images&cd=vfe&ved=0CBEQjRxqFwoTCJixxMy1of4CFQAAAAAdAAAAABAE

https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.liveworksheets.com%2Fjk726722ir&psig=AOvVaw1bcD9hswa22QnXqPU2dT1-&ust=1681288270863000&source=images&cd=vfe&ved=0CBEQjRxqFwoTCOiw36a2of4CFQAAAAAdAAAAABAJ

Introduction to the Subject: Logical patterns exist in and around us in the environment and it is a regular occurrence in many Mathematics concepts. Patterns can be recognized, extended and generalizations are formed using words and symbols based on observations. The same pattern can be replicated/translated/represented using different formats, using numbers, geometric representations as well as physical resources. For learners of grade one, patterning activities should involve opportunities for manipulating physical resources. This clearly allows them to extend, create patterns and make changes as they engage in the activities with a feeling of accomplishment. Moreover, the use of physical items creates a hands-on approach for students and encourages trial and error which is an important strategy in Mathematics. Patterns are observed in multiple areas; singing, writing, poetry, story-telling, the observed environment. Therefore, opportunities for developing the concept of patterns should be presented to students whereby their senses are stimulated and every learner has an opportunity to succeed through dance (body movements), singing, piecing physical materials together; ultimately catering to students at the concrete level so that full concept formation takes place.
Strand (Topic): Pattern and Relationships
Essential Learning Outcome 2.3: Variables and Relationships - Writing Expressions and Equations
Grade One Level Expectations: Can write number sentences to record what has been built
Key skills: counting, calculating, analyzing, proving, problem solving
Concepts: expressions, equations, number sentences, equivalence

Specific Curriculum Outcomes:	**Inclusive Assessment Strategies:**	**Inclusive Learning Strategies:**
Learners will be expected to: • **Determine whether given pairs of expressions are equivalence or balance using concrete objects, as well as operations on whole numbers.** • **Interpret the meaning of the equal sign correctly and determine if equations involving addition and subtraction are true or false.**	***OBSERVATION:*** Use a simple observation checklist while learners use the pan balance or arm balance to form equations. EXAMPLE: The Learner: | Yes | No | Sometimes Uses counters correctly to maintain balance. | | |	Using a pan balance or arm balance, learners will understand the concept of a balanced equation and will manipulate coloured counters of equal size to form as many equations as possible. An '=' sign can be stuck in the middle. 

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:

- **Determine the unknown whole number in an addition or subtraction equation with three whole numbers.**
- **Formulate number sentences to solve word problems (including real-life scenarios/situations) involving addition of two or three whole numbers and subtraction of two whole numbers.**
- **Express equalities as different representations of the same quantity (0 to 20).**
- **Use addition and subtraction up to 20 to solve one step word problems involving adding to, taking from, putting together and taking apart, with unknowns in all positions.**

Correctly forms equations using counters.			
Expresses equalities as different representations of the same quantity			
Formulates equations for given stories/word problems.			
Creates stories/word problems for given equations			

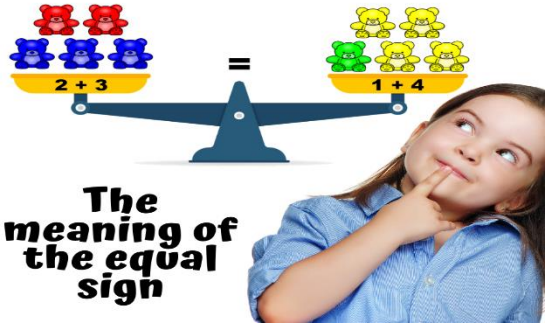
In the example above, the progression of the concept can be seen from the first to last item.

The checklist can be modified for the use of stackable blocks, as well as 5 and 10 frames.

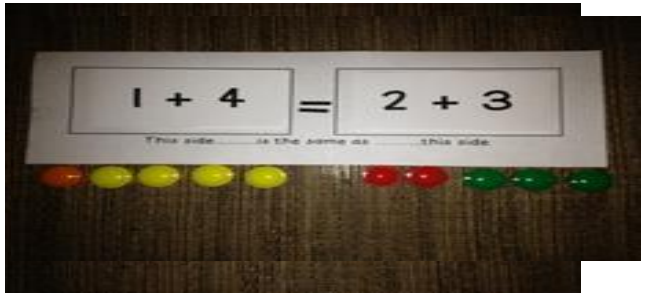
TALKING CIRCLES

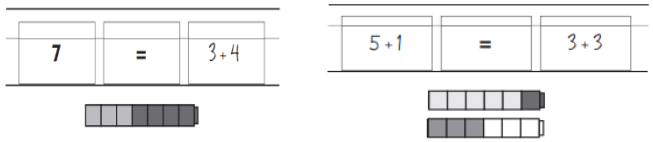
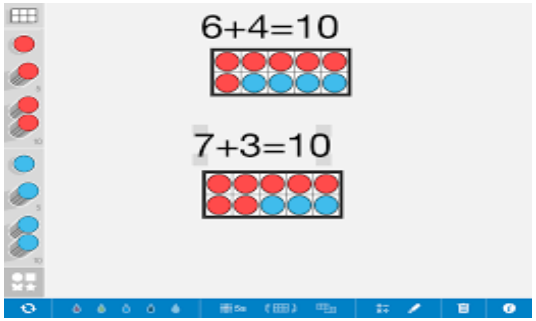
Have students pull their chairs and/or desks in a physical circle in the classroom. The teacher calls out (or writes) three numbers and students are to

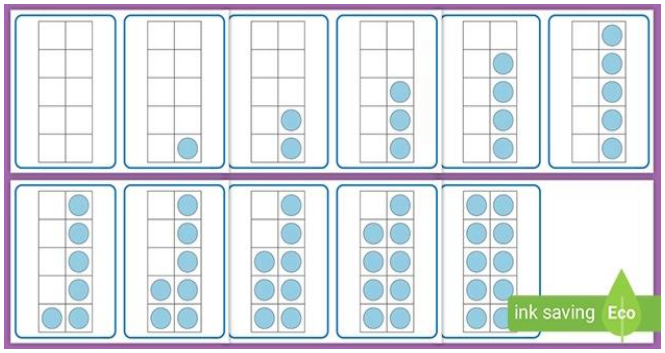
https://werg`www.mathcoachscorner.com/2012/11/the-meaning-of-the-equal-sign/



Use number bonds to develop an understanding of the commutative property of addition (for example, 2+ 3 = 3+2), as well as the part-part-whole relationship of numbers.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	formulate a number sentence using all three numbers. The first person to answer gets to hold a ball. This ball will be sent to the next person who answers correctly and so on. ***PRODUCT - PLAYING GAMES*** Have learners play fishing games in small groups to collect numbers that will make number sentences true. Observe learners as they discuss what is needed to make number sentences true and why. ***THINK PAIR SHARE*** Allow learners to work in pairs or groups where they discuss different scenarios for given equations. Provide them the opportunity to present to the class using concrete materials/role play/discussion. In mixed ability groups, allow learners to formulate equations for given word problems/stories. This will provide an opportunity for struggling learners to become more engaged (inclusion). Allow them to present, by reading the problem to the class and then explaining how they arrived at the equation. Ensure that each group member plays an active role in the activity. Note:	Use counters and cards to make the connection from concrete to abstract when forming equations.  https://www.mathcoachscorner.com/2012/11/the-meaning-of-the-equal-sign/ Use stackable blocks of different colours (but same size) to form equations. For example, they can form two stacks with eight blocks each and can manipulate those stacks with different colours to form different equations using fact families. Examples of equations: 7 + 1 = 8 (7 blue and 1 red) 3 + 5 = 8 (3 blue and 5 red) 6 + 2 = 8 (6 blue and 2 red)

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	For presentations, a scoring rubric can be used as formative assessment. ***EXIT TICKETS*** Ask learners to write a number sentence that equals 12. Each learner will be given a blank card or sticky note to write his/her number sentence. These can be posted on a board in the classroom.	 https://www.mathlearningcenter.org Note: Both addition and subtraction will be done. Learners will master the use of 5 frames and will then use 10 frames to formulate number sentences for given scenarios/ situations. Allow them to manipulate those frames to formulate as many equations as possible.  https://iteachwithipads.com/2015/01/23/using-the-ipad-for-addition/

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		 https://www.twinkl.co.uk/resource/ten-frame-step-pattern-flashcards-t-m-30509 Have learners play a game of dominoes and formulate number sentences while the game is being played. Give learners cards with number sentences and have them determine which ones are true or false. Encourage divergent thinking by encouraging learners to write equations in different ways, with the unknown at varying positions. SIMPLE EQUATIONS ➢ 12 = 7 + ☐ ➢ 5 + 7 = ☐ ➢ ☐ + 5 = 12

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		➢ ☐ = 5 + 7 COMPLEX EQUATIONS ➢ 9+1 = 3+ ☐ ➢ ! + ☐ = 3+4 ➢ 9 +1 = ☐ +4 ➢ 9 + ☐ = 3+4 Note: The above example can also be applied to subtraction. Give learners two sets of cards, one with number sentences, and the other with word problems/stories/scenarios. Have them engage in cooperative learning where they match those cards correctly. For example: Janai had 12 apples. She ate 3 of them.  Chaz saw 3 sheep, 4 cows and 6 birds on the way to school. How many animals did he see in all?  12 - 3 = 9 3 + 4 + 6 = 13

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		Allow learners to engage in reversible thinking by creating their own stories/scenarios/word problems for given equations. NOTE: Problem Solving should be incorporated in most, if not all learning strategies.

Useful Content Knowledge for the Teacher about the Outcome:

Expressions versus Equations

An expression refers to a mathematical statement with a minimum of two numbers and at least one math operation (+, -, ×, ÷).

Examples of expressions: 1+4 6-0 13-6

An equation is a mathematical sentence that has two equal sides separated by an equal sign (=).

Examples of equations: 2+3=5 5=3+2 7-2 = 5 4+1=3+2

Equality refers to the relationship between quantities that have the same (or equal) value. Equality is represented using the symbol "=".

Number Bonds

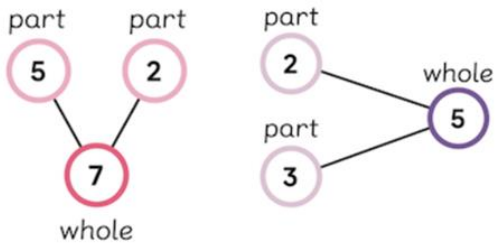
Number bonds show how a given number can be split, or how two numbers can be combined to form another number. Number bonds are used to demonstrate the part-part-whole relationship of numbers.

Examples of number bonds:

- Number bonds to 5: 1 and 4, 2 and 3
- Number bonds to 10: 9 and 1, 8 and 2, 7 and 3, 6 and 4, 5 and 5
- Number bonds to 20: 19 and 1, 18 and 2, 17 and 3, 16 and 4, 15 and 5, 14 and 6, 13 and 7, 12 and 8, 11 and 9, 10 and 10

The number bonds above can be used to form simple addition number sentences, for example, 1+4=5, 2+3=5

Another way of representing the aforementioned relationships is using the diagram below.



Inclusive Resources and Materials from Regional Specialists

- dominoes, candy, pebbles, sea shells, beads, money, counters, popsicle sticks, number cards

Additional Resources and Materials

https://www.youtube.com/watch?v=C9HRCjEHVp4&t=574s

https://www.twinkl.co.uk/teaching-wiki/ten-frame

https://www.twinkl.co.uk/resource/t-n-4601-new-number-bonds-to-10-on-robots-worksheet

https://chrome.google.com/webstore/detail/number-frames-by-the-math/idlcfdihcafblaoadpfeofbcbcmfogbc?hl=en#:~:text=Number%20Frames%20help%20students%20structure,in%20relation%20to%20benchmark%20quantities.

Opportunities for Subject Integration:

- Physical Education: Use different exercises (for example, jumping jacks) to form number sentences.
- Music: Use different rhythm combinations to clap up to 5 or 10 times.
- Language Arts: Count the number of letters in a compound word, and decompose it to form an addition number sentence.
  Write stories for given number sentences using correct grammar and mechanics.
- Craft: Create representations of number bonds using items in their surroundings, for example, leaves and stems, popsicle sticks/string and bottle caps
- Health and Family Life : Use number of family members, immediate and extended, to form number sentences, for example, number of children + number of adults = total number of family members

Elements from Local Culture:

Use the game of "Ticky Toc" to form number sentences.

Resources for a learner who is struggling: *(Links to earlier learning activities for similar knowledge, links to resources for special education needs)*

Resources for a learner who needs challenge: *(Links to learning activities and resources in later grades)*

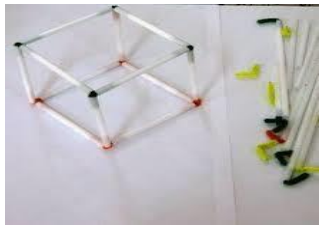
GEOMETRICAL THINKING

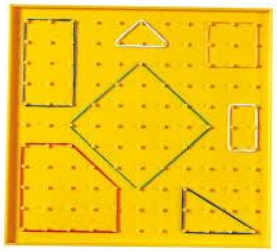
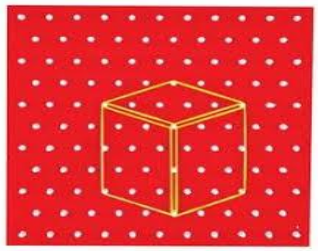
Introduction to the Subject:
Geometry is one of the oldest branches of mathematics and is concerned with the study of shapes, sizes, and positions of objects in space. Our world is filled with shapes and objects of different designs; therefore, a deep understanding of geometric thinking is important. Geometric thinking is an essential skill that involves visualizing, analyzing, and manipulating shapes, objects, and space. It is a critical skill that students need to develop to understand many mathematical concepts and to solve real-world problems. To develop geometrical thinking students should observe pictures , diagrams and models ,participate in hands-on activities ,provided with the opportunity to make real -life connections ,collaborative learning and opportunities to engage in technological activities.

Strand (Topic): Geometrical Thinking

Essential Learning Outcome 1.1: Explore and Analyze Geometric Shapes and Relationships - Developing spatial sense

Grade Level Expectations: Use language that describes shapes, objects, and space (3D Objects: cube, cone, cylinder, sphere; Polygons: square, rectangle, triangle; Circle) orally and in writing to describe a picture or object in real world contexts or an object undergoing a transformation; Use positional language (such as beside, above, below, behind, in front of, next to); Use gestures that aid in the understanding and communication of a description; Find shapes or paths hidden in a picture or space (locate an object in a simple picture, complete a maze); Draw, build and make predictions about 2D shapes and 3D objects in picture or in real world context and 2D shapes undergoing a transformation.

Specific Curriculum Outcomes:	*Inclusive Assessment Strategies:*	Inclusive Learning Strategies:
• **Use language that describes 3D objects, such as cube, cone, cylinder, sphere, orally and in writing to describe a picture or object in real-world contexts.** • **Use language that describes polygons, such as square, rectangle, and triangle, orally and in writing to describe a picture or object in real-world contexts.** • **Recognize and name 3D shapes.** • **Recognize and name 2D shapes.** • **Identify 2D shapes in real world context.** • **Identify 3D shapes in real world context.** • **Identify and name the 2D and 3D**	**Observation:** Observe and monitor students as they identify 2D shapes and 3D objects in picture or in real world context. ***Real-World Contexts:*** *Can the student identify the shapes in real-world objects, such as in a classroom, playground, or home?* *Can the student name the shapes they see correctly?* *Can the student identify the characteristics of each shape (n*umber of sides, corners, curves, etc.)? *Can the student identify the shapes from different perspectives (e.g., recognizing a triangle when it is upside down)?* Comments/Notes: _____ **Hands-on Manipulation:** Use string or craft wire to create shapes.   Use ice lollies, matchsticks, pipe cleaners, playdough to make 2D and 3D shapes.	**Real world examples:** • Use real-world examples: Start by using real-world examples of shapes and objects to help students understand their characteristics and properties. **For example,** *showing them a cube-shaped box or a cylindrical can help them understand the properties of a cube and a cylinder.* • Allow students to create their own story about shape and use the author's chair for students to tell their story about their shape. *Once upon a time in the beautiful Caribbean, there was a little fish named Sunny who loved to swim around the coral reef. One day, while exploring the reef, Sunny found a shiny seashell that was shaped like a cylinder. Excitedly, Sunny swam back to show his friends the seashell and teach them about the shape of a cylinder.* *As Sunny and his friends continued to swim, they noticed a starfish hiding under a rock. The starfish was shaped like a five-pointed star, which reminded Sunny and his friends about the shape of a pentagon. They were amazed at how shapes could be found all around them in the ocean.* *As the sun began to set, Sunny and his friends saw a school of fish swimming in the distance. The school of fish was shaped like a cone, which prompted Sunny and his friends to discuss the differences between 2D and 3D shapes.*

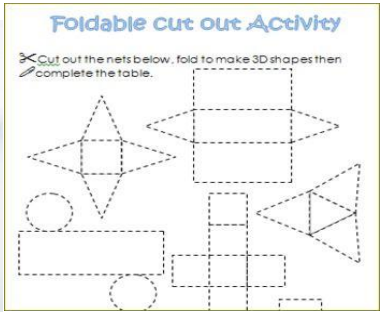
<table>
<tr><th>Specific Curriculum Outcomes:</th><th>Inclusive Assessment Strategies:</th><th>Inclusive Learning Strategies:</th></tr>
<tr>
<td>shapes whenever they undergo transformation.</td>
<td>
Have students use rubber band to create shapes on geoboard.



Use a checklist to observe students as they sort shapes into 2D shapes and 3 D objects.

Sample checklist
Student's Name: _____
Date: _____
<table>
<tr><td>Shapes to Sort: Circle, Triangle, Square, Rectangle, Sphere, Cube, Cone, Cylinder</td><td>YES</td><td>NO</td></tr>
<tr><td>2D SHAPES</td><td></td><td></td></tr>
<tr><td>Can the student identify the 2D shapes correctly?</td><td></td><td></td></tr>
<tr><td>Can the student sort the 2D shapes into the correct category (circle, triangle, square, rectangle)?</td><td></td><td></td></tr>
<tr><td>Does the student understand the concept of flatness in 2D shapes?</td><td></td><td></td></tr>
<tr><td>3D OBJECTS</td><td></td><td></td></tr>
<tr><td>Can the student identify the 3D objects correctly?</td><td></td><td></td></tr>
<tr><td>Can the student sort the 3D objects into the correct category (sphere, cube, cone, cylinder)?</td><td></td><td></td></tr>
<tr><td>Does the student understand the concept of depth in 3D objects</td><td></td><td></td></tr>
</table>
</td>
<td>
With their minds full of new knowledge about shapes, Sunny and his friends swam back to their homes in the coral reef, excited to share their discoveries with their families.

Use Manipulatives :

Have students use cut outs to make solid figures.

Students use the given solid figures and make a completely new object.
Students make a collage with different shapes and materials.
Have students trace the sides and faces of shapes with their fingers.

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

Specific Curriculum Outcomes:	*Inclusive Assessment Strategies:*	Inclusive Learning Strategies:

Can the student identify the number of faces, edges, and vertices of each 3D object?		

Comments/Notes:

_____

Interviews:

Conduct interviews with students to assess their understanding of shapes and space. Ask open-ended questions and encourage students to use descriptive language and gestures to communicate their ideas.

Sample interview questions:

- *Can you tell me the names of some 2D shapes that you know?*
- *Can you show me a 2D shape using your hands or fingers? What is it called?*
- *What is the difference between a circle and a square? Can you show me with your hands or draw it on paper?*
- *Can you tell me the names of some 3D shapes that you know?*
- *Can you show me a 3D shape using toys or objects? What is it called?*
- *How do 3D shapes differ from 2D shapes? Can you show me with your hands or draw it on paper?*
- *Can you describe a real-life object that is shaped like a cylinder?*
- *Can you tell me what a cube looks like and give me an example of a real-life object that is shaped like a cube?*

- Use ice lollies, matchsticks, pipe cleaners, playdough to make 2D and 3D shapes.

- Have students choose a shape and allow them to speak about it.
- Mystery Bag of Shapes - students are blind folded, choose a shape from the mystery bag then give a description of the chosen shape.
- Students use geoboards to make geometric shapes.

Questioning

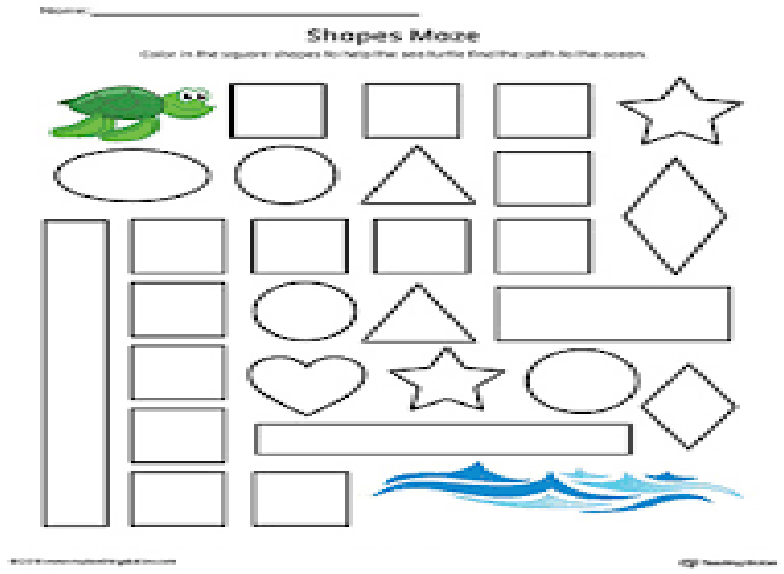
- Have students identify the relationship between a 2d and 3d shape. *For example; What are the differences between 2D and 3D shapes? What are the similarities? How many 2D shapes combine to make this 3D shape? Is a cube a 2D or 3D? Explain. Shadow is 2D or 3D? Explain.*

Provide students with the properties and they must find the name of the shapes in the word search puzzle.

Field Trip: Allow students to make real life connection with shapes. For example:

Specific Curriculum Outcomes:	*Inclusive Assessment Strategies:*	Inclusive Learning Strategies:
	❖ *How do shapes and space relate to each other? Can you give me an example of how shapes are used in our daily lives?* ❖ *Can you think of a fun activity we can do to learn more about shapes and space?* ***Shapes to Identify:*** Circle, Triangle, Square, Rectangle, Oval, Diamond, Star, Heart **Observe** students using a checklist as they find shapes or paths hidden in a picture or space (locate an object in a simple picture, complete a maze). ***Question students about shapes or paths hidden in a picture or space (locate an object in a simple picture, complete a maze).***  	• Engage students in a shape walk to identify different shapes in their school/community/church/ recreation areas. • Have students identify a shape and state the uses of it in real life setting. • Shape hunt outside: Take students on a nature walk and ask them to find shapes in the environment such as circles in tree trunks or triangles in leaves. Encourage them to describe the shapes they find and possible purpose of the shape. Use positional language to describe the location of the shapes. • Have students interview each other about the missing shape. • Provide opportunities for students to recall facts about properties of shapes. *For example; have students make a shape book which will include the shape, properties about the shape and where it can be found in the environment.* **Virtual Reality:** Virtual reality (VR) technology can be used to immerse students in 3D environments and allow them to explore shapes, objects, and space in a more interactive and engaging way. Teachers can use VR to create virtual tours of real-world spaces, such as museums or historical landmarks, or to create immersive experiences that allow students to explore imaginary worlds. Smithsonian National Museum of Natural History Virtual Tour: https://naturalhistory.si.edu/visit/virtual-tour

Specific Curriculum Outcomes:	*Inclusive Assessment Strategies:*	Inclusive Learning Strategies:
	Predictions Students are asked to make predictions about 2D shapes and 3D objects in picture or in real world context and 2D shapes undergoing a transformation. For example : *Which 2D shape will look the same if it is turned upside down?* **Questioning:** Ask students questions about shapes, objects, and space to assess their understanding of the concepts. Students are required to identify and name shapes with different size, colour, orientation, as well as when they undergo transformation. For example : *Can you identify examples of triangular shapes in the classroom ?* Formative Assessment: Use formative assessment techniques, such as observation, questioning, worksheets and discussions, to gauge students' understanding of geometric shapes. Students draw, build, and make predictions about 2D shapes and 3D objects in picture or in real world context and 2D shapes undergoing a transformation. **Games:** Play interactive games that require them to identify, name shapes, match shapes, Draw, build and make predictions about 2D shapes and 3D objects in picture or in real world context and 2D shapes undergoing a transformation. *WEBSITES:* *https://www.splashlearn.com/math/shapes-games-for-1st-graders*	British Museum Virtual Tour: https://britishmuseum.withgoogle.com/ The Louvre Virtual Tour: https://www.louvre.fr/en/visites-en-ligne NASA Virtual Tour: https://www.nasa.gov/centers/kennedy/about/information/virtual-tour.html Mount Rushmore Virtual Tour: https://www.nps.gov/moru/learn/photosmultimedia/virtualtour.htm The Great Wall of China Virtual Tour: https://www.thechinaguide.com/destination/great-wall-of-china Yellowstone National Park Virtual Tour: https://www.nps.gov/yell/learn/photosmultimedia/virtualtours.htm **Digital Games:** Digital games can be used to teach concepts related to shapes, objects, and space in a fun and interactive way. Teachers can use games that challenge students to find hidden shapes in a picture or complete a maze using positional language. Digital games can be a great way to engage students in learning and encourage them to practice new skills. *Geoboard - This game allows students to create and manipulate different shapes using a digital geoboard:* https://www.mathlearningcenter.org/web-apps/geoboard/

Specific Curriculum Outcomes:	*Inclusive Assessment Strategies:*	Inclusive Learning Strategies:
	https://www.abcya.com/games/shapes_geometry_game *https://www.education.com/games/first-grade/geometry/* *https://www.smashmaths.com.au/measurement-and-geometry/location-and-transformation/flip-slide-and-turn*	*Tangrams - This game challenges students to use tangram pieces to recreate different shapes and objects:* https://www.coolmathgames.com/0-tangrams **Shape maze activity:** Provide students with a simple maze and ask them to find the path that leads to a specific shape. Encourage them to describe the shapes they see in the maze and use positional language to describe their location. ***E.g. square shape maze*** 

Specific Curriculum Outcomes:	*Inclusive Assessment Strategies:*	Inclusive Learning Strategies:
		Inquiry-Based Learning **Shape Transformations**: Provide students with a set of 2D shapes (e.g., square, rectangle, triangle) and ask them to transform them into different shapes (e.g., cutting a square to make two triangles). Encourage students to use positional language and gestures to describe the changes they make. **Shape transformation game**: Provide students with a set of cards that show different shapes undergoing a transformation such as stretching or shrinking. Encourage them to describe the changes they see and use positional language to describe the location of the shapes. **Projects :** • *Create a shape book using pictures of shapes taken in the environment or use cut outs of shapes.* • *Create a transformation shape book showing geometric shapes before and after transformation.* • *Students design a maze to find shapes.* • *Students create a video highlighting.* • *Find shapes or paths hidden in a picture or space (locate an object in a simple picture, complete a maze); Draw, build and make predictions about 2D shapes and 3D objects in picture or in real world context and 2D shapes undergoing a transformation.*

Useful Content Knowledge for the Teacher about the Outcome:

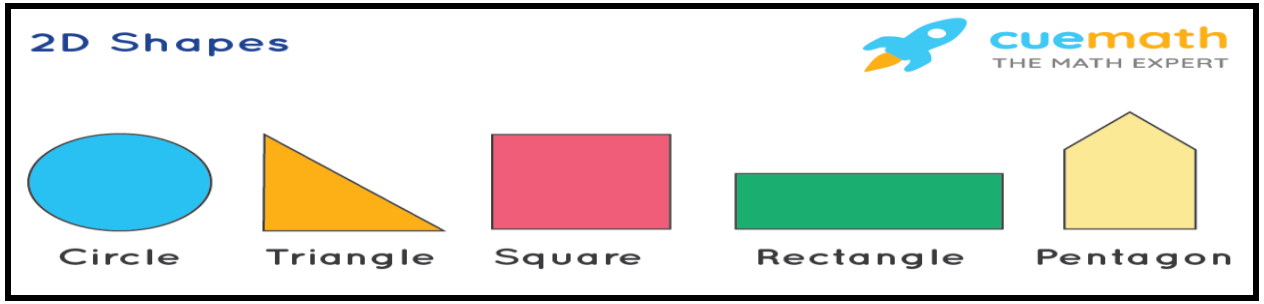
Geometric Shapes

Any object around us with a fixed structure can be considered a geometric shape. These shapes are made up of lines, curves, angles, and surfaces.

In geometry, 2D shapes (2 dimensional shapes) can be defined as plane figures that are completely flat and have only two dimensions - length and width. They do not have any thickness and can be measured only by the two dimensions.

A circle, square, rectangle, and triangle are some examples of two-dimensional shapes and **these shapes can be drawn on paper.**

All the 2-dimensional shapes have sides, vertices (corners), and interior angles, except for the circle, which is a curved figure. 2D shapes with at least three straight sides are called polygons and these include triangles, squares, and rectangles.



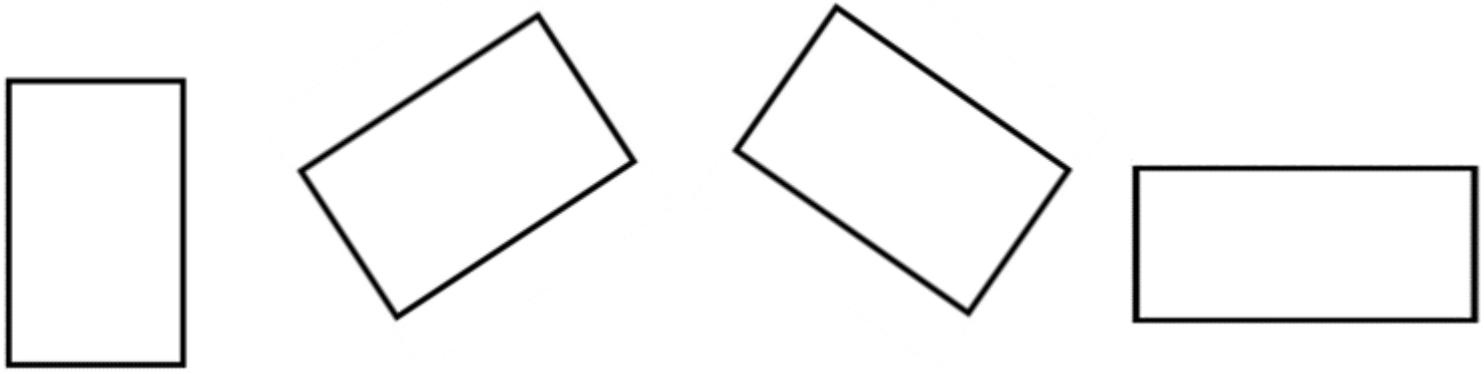
https://www.cuemath.com/geometry/2d-shapes/

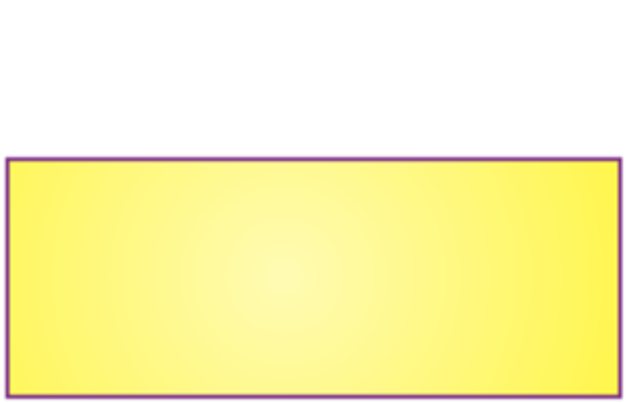
Two-Dimensional Geometric Shapes

Show both 2D and 3D shapes of different size, colour and orientation and position

TRIANGLE

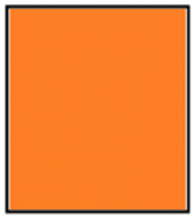

WHAT ARE RIGHT TRIANGLES?

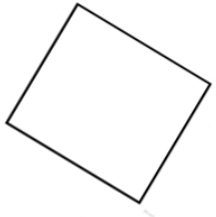


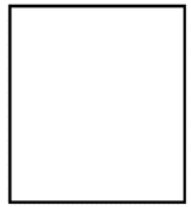


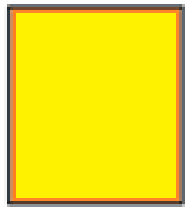
RECTANGLE

SQUARE

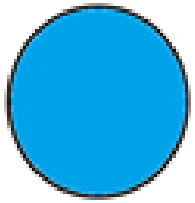


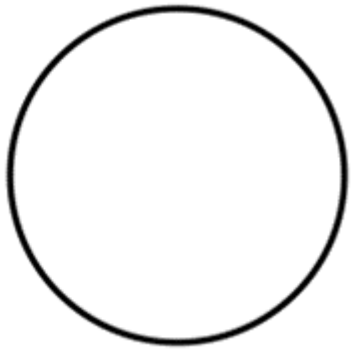






CIRCLE

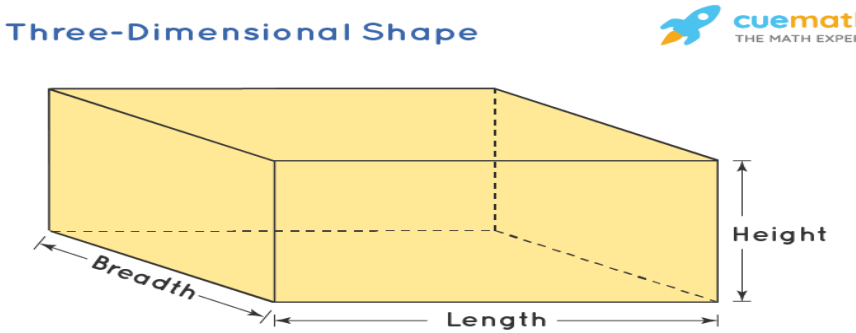




- A triangle is a closed two-dimensional geometric shape with three sides. Square: A square is a two-dimensional geometric shape that is formed by four sides of equal length.
- Rectangle: A rectangle is a four-sided, two-dimensional geometric shape in which the length of the opposite sides is equal. For example, laptop screens, etc.
- Circle: A circle is a closed two-dimensional geometric figure that is round in shape. A circle does not have any lines or corners.

Solid Shapes

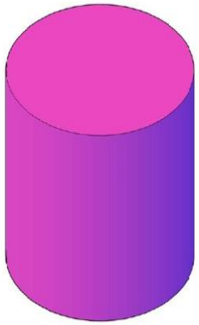
Solid shapes are nothing but solids that consist of 3 dimensions, namely length, breadth, and height. Solid shapes are also known as Space figures and 3D shapes.



Types of solid shapes-

- Sphere

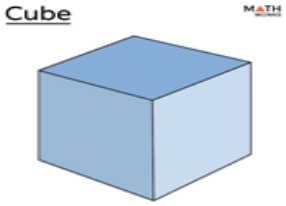
- Cylinder

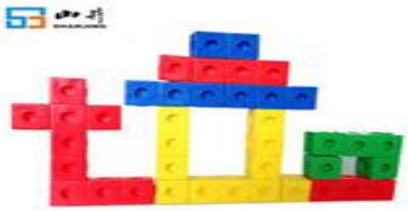


- **Cone**



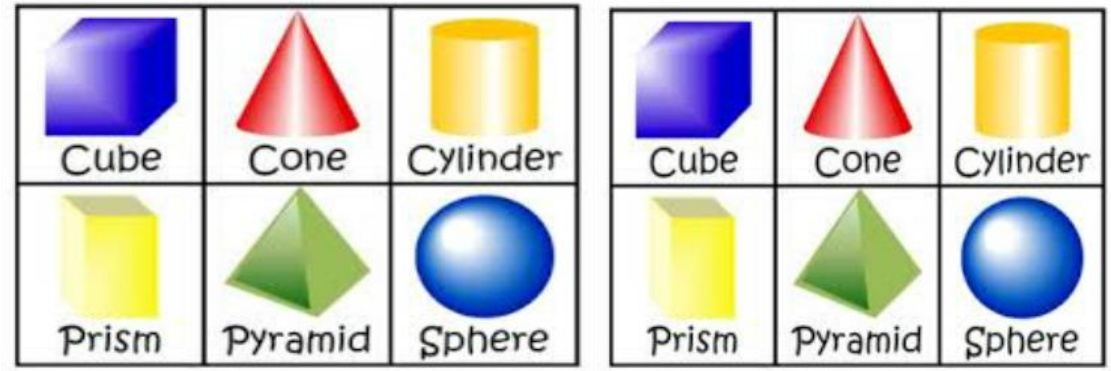
- **Cube**



- **Cube**: a shape with six square faces that are all the same size.
- **Sphere**: a round shape that has no corners or edges.
- **Cylinder**: a shape with two circular faces that are the same size and a curved surface that connects them.
- **Cone:** a shape with a circular base and a pointed top.

- Cuboid



http://smal1fan.weebly.com/3d-geometry.html

Positional language words:
In Under On top Over Beside Next to Inside Outside Beneath Between Right Left

Shapes and space are related in that shapes exist in space. Space is the area where shapes exist, and shapes help us understand how objects are organized in space. For example, a circle is a shape that can be found in the space around us, such as a round ball or a tire. Similarly, a cube is a shape that can help us understand how objects can take up space in different ways, such as a box or a building block.

- Inclusive Resources and Materials from Regional Specialists (texts, family &community knowledge and resources, contextually relevant professional web resources)
- Manipulatives: Manipulatives such as pattern blocks, popsicle sticks and geoboards can be used to help students visualize and manipulate basic shapes and construct composite shapes.
- Virtual Manipulatives: Online virtual manipulatives such as the National Library of Virtual Manipulatives can be used to help students interact with shapes and objects on a screen and reinforce their understanding of geometry concepts.

- Videos: Videos that showcase real-world examples of shapes and objects can be used to help students develop an understanding of the properties of shapes and objects.
- Games: Interactive games such as Shape Match or Shape Builder can help students practice identifying, sorting, and patterning shapes and objects.
- Books: Children's books that include geometric concepts can help students learn about shapes and objects in a fun and engaging way.
- Visual Aids: Posters or anchor charts that display examples of basic shapes and 3D objects can be used to help students recognize and name these shapes.
- Augmented Reality: Augmented reality apps such as GeometryAR can bring 3D shapes and objects to life and allow students to interact with them in a unique way.
- Interactive whiteboards and digital tools: Interactive whiteboards and digital tools such as iPads and laptops can be used to engage students in interactive activities and games that promote spatial sense.
- Graphic organizers: Graphic organizers such as Venn diagrams and T-charts can be used to help students compare and contrast different shapes and objects. For example, a T-chart could be used to compare the attributes of a cube and a cylinder.
- Sentence frames: Sentence frames can be used to support students in using appropriate language to describe shapes and objects. For example, a sentence frame might be "The shape of the window is a ____ because it has ____ sides."
- Outdoor exploration: Students exploring their environment can provide opportunities to develop spatial sense. For example, students might identify and describe the shapes they see in nature, such as the round shape of a flower or the triangular shape of a mountain.

Additional Resources and Materials Books

Worksheets
Board games
Wheel of Fortune (spinner)
The Price is Right.

Opportunities for Subject Integration:

Language

Make a shape book or posters.
Use adjectives to describe shape. For example. *The square is big. The yellow triangle is small.*

Science

Identify and name the shape of objects in their natural environment.

Sort and classify objects based on their shapes.

Art

Do finger painting to create shapes.

Make a collage of different shapes or same shape from different materials.

Use match or lollies sticks to create 2D and 3D shape.

Use string or craft wire to create shapes.

Use colour code to colour each shape

Social Studies

Students should be able to identify different shapes of important buildings and signs in their community

Elements from Local Culture:

Games such as Old Grady and musical chairs

Materials: play dough, match sticks, popsicle sticks,

Fruits and vegetables come in a variety of shapes and sizes and can be used to teach 3D shapes. For example, mangoes can be used to teach about spheres, a yam to teach about cylinders,

Musical instruments: For example: a drum can be used to teach about cylinders while a maraca can be used for teaching a compound shape since it comprises of a sphere and a cylinder.

Sporting equipment: A cricket ball and football can be used to teach about spheres, or a basketball to teach about spheres

Local architecture can provide examples of various 2D shapes such as squares, rectangles, triangles and circles. For example, a classroom can use images of local buildings such as houses, temples, mosques, churches or monuments to teach about different shapes.

Resources for a learner who is struggling:

Games

Manipulatives

Visual Support

Interactive games

Songs

Resources for a learner who needs challenge:
Worksheets
Using local materials to create both 2D and 3D shapes.
Creating videos on shapes on tik tok

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 pas**sages, connections to educational research):**

2D shapes can only be represented as a picture and are only faces on solid figures.

It should be noted that cutouts of 2D shapes become 3d shapes.

Ensure shapes are presented in different size, colour and orientation.

Allow shapes to undergo transformation.

Introduction to the Subject: Geometry is one of the oldest branches of mathematics and is concerned with the study of shapes, sizes, and positions of objects in space. Our world is filled with shapes and objects of different designs; therefore, a deep understanding of geometric thinking is important. Geometric thinking is an essential skill that involves visualizing, analyzing, and manipulating shapes, objects, and space. It is a critical skill that students need to develop to understand many mathematical concepts and to solve real-world problems. To develop geometrical thinking students should observe pictures, diagrams and models, participate in hands-on activities, provided with the opportunity to make real -life connections, collaborative learning and opportunities to engage in technological activities.
Strand (Topic): Geometrical Thinking
Essential Learning Outcome 1.2: Explore and Analyze Geometric Shapes and Relationships - Explore and Analyze Geometric Shapes and Relationships - Sorting, patterning, and building with 2D & 3D Shapes
Grade Level Expectations: Recognize, name, represent, construct, and justify shapes (specifically circle, square, rectangle, triangle); and 3D objects (cube, cone, sphere, cylinder) Replicate and construct composite 2D shapes (using aforementioned shapes to build composite shapes) and 3D objects; Compare the characteristics of shapes (number of sides, number of corners) and objects (sides, stacks, rolls, number of corners); Sort and pattern with shapes and objects based on characteristics.

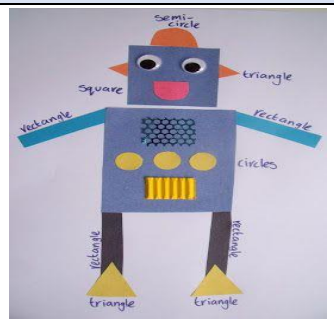
Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **Recognize and name the basic 2D shapes (circle, square, rectangle, and triangle) and 3D objects (cube, cone, sphere, and cylinder).**	**Games** Play ***musical chairs*** and ***Old Grady*** on shapes so that students' ability to identify and name shapes will be highlighted. ***Mystery Bag of Shapes*** - students are blind folded, chose a shape from the mystery bag then give a description of the chosen shape .	**Games** (Useful for reinforcement) Have students play the 'Shape is Right (modification of the price is right) - place properties of the screen and students must name the correct shape and state the attributes. Have students spin the wheel of fortune and allow them to speak about the shape that the needle points. Have students play interactive games on tablet or computer.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **Represent and construct the basic 2D shapes and 3D objects using appropriate materials and tools.** • **Justify the properties of the basic 2D shapes and 3D objects, such as the number of sides, corners, and faces.** • **Replicate and construct composite 2D shapes by combining the basic shapes in different ways.** • **Replicate and construct 3D objects by combining the basic 3D objects in different ways.** • **Compare the characteristics of shapes and objects, such as the number of**	**Drawings** • Allow students to draw 2D and 3D shapes. • Create a poster on their favorite shape. • Create a poster to advertise their favourite shape and its properties. • Use one or more shapes to construct a compound shape. • Draw a shape using a variety of plane shapes. **Project** Allow students to create both 2D and 3D shapes using local materials. Create a shape book which highlights the shapes and their properties. Students make a collage with different shapes and materials. **Differentiated Instruction**: Differentiate instruction based on students' individual needs and abilities. Provide additional support or scaffolding for students who may struggle with using appropriate vocabulary and offer extension activities for those who demonstrate proficiency in using the vocabulary.	Students are provided with a bag of shapes to select one then they provide a description of the shape. Place a worksheet with an assortment of shapes and have students draw an object where they must use the shapes specified by the teacher. Have students identify the relationship between a 2d and 3d shape. Provide students with the properties and they must find the name of the shapes in the word search puzzle. **Manipulatives:** Have students use cut outs to make solid figures. Students use the given solid figures and make a completely new object. Have students trace their fingers on 2D shapes made from sand to identify the number of sides and corners. Allow students to manipulate shapes so that they can deduce those that roll and stack (provide with a toy ramp and allow them to push the shape) Students use geoboard to make geometric shapes.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
sides, corners, and faces, and identify similarities and differences between them. • **Sort and pattern shapes and objects based on their characteristics, such as the number of sides, corners, and faces, and create patterns using different shapes and colors.** • **Represent and construct the basic 2D shapes and 3D objects using appropriate materials and tools.** • **Replicate and construct 3D objects by combining the basic 3D objects in different ways.**	**Example** *Tier 1- Justify the shape appropriateness for its usage in real life context.* *Tier 2- State the properties of all shapes* *Tier 3- Classify the given shapes based on the identified characteristics/attributes.* **Performance Assessment** Pupils create a mystery object using 2D shapes and 3D objects and make oral presentations. Allow students to do show and tell on a selected shape (name the shape, properties, importance and objects it can be seen.) **For Example:** NAME OF STALL: The Sweet Spheres. Items on display:  	**Differentiated Instruction:** Differentiate instruction based on students' individual needs and abilities. Provide additional support or scaffolding for students who may struggle with using appropriate vocabulary and offer extension activities for those who demonstrate proficiency in using the vocabulary. Example ***Tier 3****: Give shapes to manipulate and videos that highlight attributes. Also scaffold students and use guided questions to elicit the properties,* ***Tier 2:*** *Show pictures/videos that depict the properties and give them the shapes to manipulate.* **Tier 1:** *Use virtual tools to highlight the attributes of the 3D shapes together with manipulation of objects.* **Geometric Art Project:** Assign groups to create a piece of art using geometric shapes. This can be a 2D drawing or a 3D sculpture. This activity encourages creativity, visual-spatial skills, and collaboration. **Visual aids:** Students are provided with visual aids such as pictures, models, or real-world objects to help them visualize the shape, size, and properties of different geometric figures. **Field Trip:** Students are engaged in a shape walk to identify different shapes in their environment.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **Discuss the importance of geometrical shapes in the environment.** • **Students will volunteer to role play scenarios involving geometry shapes to show their appreciation for Geometry.**	Construct 3D shapes **Observational Checklist.** • Observe students as they construct 3D shapes. • Observe students as they sort and group shapes according to the number of sides, corners and faces. **3D Object Investigation:** Provide students with a collection of 3D objects (e.g. a cube, cone, sphere, cylinder) and ask them to investigate and identify the different characteristics of each object (e.g. number of faces, edges, corners). Have them draw and label each object in their learning log. **Exhibition** Select a 2D or 3D shape, and students should be able to carry from home objects that reveal their shape. Students make a collage with different shapes and materials.	Have students identify a shape and state the uses of it in real life setting. Have students identify shapes on worksheets. Have students colour each shape with a particular colour Use the author's chair for students to tell their story about their shape. Have students do an interview about the missing shape. Have students make a shape book which will include the shape, properties about the shape and where it can be found in the environment. **Grouping/Collaborative Learning:** **Build a city:** Have students work in groups to design and build a city using different shapes. They can use cardboard, construction paper, or other materials to create buildings, roads, and other structures. Each group can present their city to the class, describing the shapes they used and the reasoning behind their design choices.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:



Provide students and allow students to select the most appropriate material and construct 3D shapes.

Rubric

- Use rubric to assess students' oral presentation, projects, how they present their shapes in their booths, videos created that depict the properties of shapes, as they do show and tell on their selected 3D objects.

For example,

Criteria	Always 3	Sometimes 2	Rarely 1
Student speaks clearly and loudly enough to be heard by the class			
Student describes their 3D object using descriptive language (e.g. size, shape, color, texture, face)			

Inquiry Based Learning

EXAMPLE

Start with a question: Begin by asking the students a question that will spark their curiosity about shapes.

" What shapes do you see around you every day?" **or** ***"How can you describe the shapes you see?"***

Explore the shapes: Allow the students to explore different shapes by providing them with a variety of materials such as pattern blocks, wooden shapes, and paper shapes. Encourage them to sort and group the shapes based on their attributes such as the number of sides, the number of corners, and the length of the sides.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:

Student shares an interesting fact or story about their 3D object			
Student shows confidence and enthusiasm while presenting			

Journal entries

Write about a shape they observe on their way to school.

Learning Log

Have students write about what they are learning and how they feel about it.

Today I am learning about_____

I like it because_____

Pupils create a shape log which records the different shapes that they observe in their environment for a given period.

Paper and Pencil
Formative Assessment

Provide a list of 2D and 3D shapes and students are required to match them with their corresponding names or representations.

Record observations: Ask the students to record their observations about the different shapes they have explored. You can provide them with a worksheet or chart to record their observations.

Discuss findings: Have a class discussion about the students' findings. Ask them to share their observations and what they have learned about the different shapes. Encourage them to ask questions and to challenge each other's thinking.

Apply knowledge: Provide the students with real-world examples of shapes, such as buildings, vehicles, and everyday objects, and ask them to identify the shapes and their attributes.

Reflect: End the lesson by asking the students to reflect on what they have learned. Encourage them to share how they will use their knowledge of shapes in the future.

Project Based Learning

Shape Collage: Have students collect pictures of objects that represent different shapes (such as circles, squares, rectangles, triangles, and hexagons) from magazines, newspapers, and online resources. Then, have them cut and paste the pictures onto a poster board, arranging them into different shapes to create a shape collage.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	• Use exit tickets which require students to identify the shape shown. • Provide worksheets whereby students are required to colour each shape using a specific color code. • Use written responses such as short answer questions or journal prompts to assess students' ability to compare the characteristics of shapes and objects. Ask them to describe the number of sides, corners, stacks, and rolls of different shapes and objects, and how they are similar or different.	***Shape Museum*:** Have students create a shape museum by designing and creating models of different shapes using clay, playdough, or other materials. Each student can choose a shape to focus on and create a model of that shape, along with a description of its attributes. The museum can be displayed in the classroom or school for others to visit. 

Inclusive Resources and Materials from Regional Specialists (texts, family &community knowledge and resources, contextually relevant professional web resources)

Manipulatives: Manipulatives such as pattern blocks, popsicle sticks, match sticks play dough, geoboards and fabric can be used to help students visualize and manipulate basic shapes and construct composite shapes.

Virtual Manipulatives: Online virtual manipulatives such as National Library of Virtual Manipulatives can be used to help students interact with shapes and objects on a screen and reinforce their understanding of geometry concepts.

Videos: Videos that showcase real-world examples of shapes and objects can be used to help students develop an understanding of the properties of shapes and objects.

Games: Local games can be tailored to help students get a better understanding of shapes. Interactive games such as Shape Match or Shape Builder can help students practice identifying, sorting, and patterning with shapes and objects as well as replicate and construct composite 2D shapes and 3D objects.

Children literature: Children's books that include geometric concepts can help students learn about shapes and objects in a fun and engaging way.For example :
The Greedy Triangle
Mouse Shapes
When a line bends - a shape begins.
Tangled: A story about shapes.
Visual Aids: Posters or anchor charts that display examples of basic shapes and 3D objects can be used to help students recognize and name these shapes.
Augmented Reality: Augmented reality apps such as GeometryAR can bring 3D shapes and objects to life and allow students to interact with them in a unique way.
Visual aids: Pictures, diagrams, and posters can be used to help students visualize and understand geometric concepts. For example, a diagram showing the different parts of a two-dimensional shape can help students learn the appropriate vocabulary to describe shapes.
Interactive whiteboards and digital tools: Interactive whiteboards and digital tools such as iPads and laptops can be used to engage students in interactive activities and games that promote spatial sense.
Outdoor exploration: Students explore their environment can provide opportunities to develop spatial sense. For example, students might identify and describe the shapes they see in nature, such as the round shape of a flower or the triangular shape of a mountain.

Opportunities for Subject Integration: (How the inclusive learning strategies might be adapted and/or applied to include other subjects in the curriculum)
Language Arts: Language arts lessons can incorporate descriptive language to name and describe shapes and objects. Students can write sentences that incorporate 2D and 3D shapes or use writing activities to reflect on their understanding of geometric concepts.
Science: Science lessons related to objects and their properties can be integrated with 2D and 3D shapes. Students can explore the properties of objects such as hardness, texture, and buoyancy, and compare them to the properties of 2D and 3D shapes. (sides, stacks, rolls, number of corners)
Art: Art is a great way to explore 2D and 3D shapes. Students can create their own art using basic shapes, composite shapes, and 3D objects. They can also explore the use of shapes in art and design.
Social Studies: Social studies lessons related to maps and buildings in their local community can be integrated with 2D shapes. Students can explore the use of shapes and patterns in maps and real life as they observe building containing geometric shapes.

Elements from Local Culture: *(References that learners might know from their local environment*
Local architecture: Show students examples of buildings in their communities or their homes , which contain geometric shapes. Students can create their own models of Caribbean houses or buildings using 3D shapes like cubes and cylinders.
Local music and dance: Use music and dance from the Caribbean to inspire movement activities that incorporate shapes. For example, students can dance in a square shape or use their bodies to create 3D shapes like cones and spheres.
Folktales and legends: Many local folktales and legends involve shapes and objects. Read these stories to the class and have them identify and draw the shapes they hear about in the story.

Resources for a learner who is struggling: (Links to earlier learning activities for similar knowledge, links to resources for special education needs)
Manipulatives: Provide the student with manipulatives such as blocks, pattern blocks, and 3D shape blocks to help them visualize and build different shapes and objects.
Visual Aids: Use visual aids such as posters, flashcards, and videos to help the student understand the different shapes and their characteristics. Use images and videos of real-world objects that have different shapes and ask the student to identify them.
Graphic Organizers: Use graphic organizers such as Venn diagrams and sorting mats to help the student sort and compare different shapes and objects based on their characteristics.
Differentiated Instruction: Provide differentiated instruction to meet the student's learning needs. Use different teaching strategies such as hands-on activities, cooperative learning, and small group instruction.
Assessment: Conduct regular assessments to monitor the student's progress and provide feedback on their performance. Provide opportunities for the student to practice identifying, naming, and constructing different shapes and objects.
Parental Involvement: Involve the student's parents or guardians in the learning process by providing them with resources and activities to support their child's learning at home.
Peer Support: Pair the struggling learner with a peer who has a strong understanding of shapes and 3D objects. This can help the struggling learner learn from their peer and develop their own understanding of the concept.

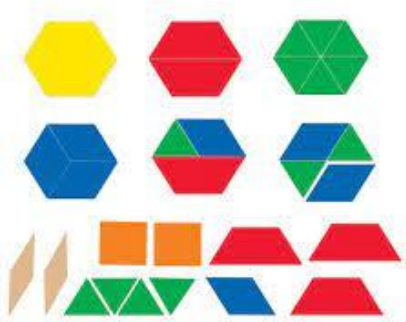
Resources for a learner who needs challenge: *(Links to learning activities and resources in later grades)*
Advanced Shape Puzzles: These puzzles are designed to challenge students who are already familiar with basic shapes. They require more critical thinking and problem-solving skills to complete.
Tangrams: Tangrams are a set of seven geometric shapes that can be combined to form a variety of different shapes and objects. They are an excellent tool for challenging students to think creatively and to visualize shapes in new ways.

3D Shape Models: Provide students with 3D models of shapes to explore. This can help them better understand the characteristics and properties of 3D shapes. **Geometry Games:** There are many online games and apps that focus on geometry and shapes. These can be a fun and engaging way to challenge students who are ready for more advanced activities. **Shape Scavenger Hunt:** Create a scavenger hunt where students need to find different shapes and objects in their environment. For example, they could look for rectangles in buildings or circles in nature. This can help them apply their knowledge of shapes in real-world situations. **Shape Art Projects:** Challenge students to use shapes to create their own unique art projects. For example, they could create a picture using only triangles or a sculpture using 3D shapes. This can help them develop their creativity and problem-solving skills while applying their knowledge of 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):**

Introduction to the Subject: Geometry is one of the oldest branches of mathematics and is concerned with the study of shapes, sizes, and positions of objects in space. Our world is filled with shapes and objects of different designs; therefore, a deep understanding of geometric thinking is important. Geometric thinking is an essential skill that involves visualizing, analyzing, and manipulating shapes, objects, and space. It is a critical skill that students need to develop to understand many mathematical concepts and to solve real-world problems. To develop geometrical thinking students should observe pictures, diagrams and models, participate in hands-on activities, provided with the opportunity to make real -life connections, collaborative learning and opportunities to engage in technological activities.
Strand (Topic): Geometrical Thinking
Essential Learning Outcome 2.1: Recognizing, Naming and Describing Shapes - Analysing and describing shapes
Grade Level Expectations: Recognize and describe attributes and characteristics of 2D shapes (number of sides, number of corners,) and 3D objects (number corners, rolls or slides, flat sides or curved sides, uniform thickness or not coming to a point, curved all around) 3D Objects to be used: cube, cone, cylinder, sphere; polygons: square, rectangle, triangle; circle

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **Identify and name 2D shapes and 3D objects, including cubes, cones, cylinders, spheres, squares, rectangles, triangles, and circles.** • **Describe the attributes of 2D shapes, including the number of sides and corners, and whether**	**Virtual Manipulatives:** Use virtual manipulatives or interactive simulations to allow students to identify and name plane and solid shape which is assessed using a rubric. **Picture-based assessments:** Use pictures or diagrams of everyday objects that resemble cubes, cones, cylinders, and spheres, and ask students to identify and name the 2D shapes within them. This can be done through	**Geometry Scavenger Hunt:** Divide students into small groups and give each group a list of geometric shapes and objects to find around the classroom or school. For example, they might need to find a rectangle, a sphere, a cone, and a cube. This activity promotes teamwork, observation skills, and spatial awareness. **Games :** **3D Bingo**

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
the sides are straight or curved. • **Describe the attributes of 3D objects, including the number of corners, whether they have flat or curved sides, and whether they are uniform in thickness or come to a point.** • **Compare and contrast the attributes of different 3D objects, such as noting that a sphere has no corners or flat sides, while a cube has six square faces and eight corners.** • **Create and extend patterns using 2D shapes, including squares, rectangles, triangles, and circles.** • **Sort and classify 2D shapes and 3D objects based on their**	worksheets or digital platforms where students can drag and drop labels to match the shapes they see in the pictures. **Observation:** Use a checklist to observe students as they manipulate 2D shapes and 3D objects to describe the attributes and characteristics as they manipulate and explore their attributes (number of corners, sides -flat or curved). **Questioning:** For example: *Which shape has six (6) square faces and eight (8) corners?* **Paper and Pencil:** • Provide students with written assignments with shapes of different size, colour and orientation that require students to differentiate shapes. • Worksheets that require students to colour each shape using a colour code for each shape. • Allow students to match the shapes that are the same. • Identify each shape drawn and use a colour code to colour each shape. • Write a sentence about each shape. **Eg.** The square is blue.	Students listen to the attributes of geometric shapes and match it with the 3D object printed on their bingo card. **The Wheel of Shapes** On a large paper the names of shapes and a spinner is attached. Students spin the wheel when the spinner stops ; students first identify whether the shape is 2D or 3D then state a characteristic. 3D Shape Hunt 3D Shape Rhyme Online 3D Shapes Games: https://www.splashlearn.com/math/3d-shapes-games https://www.education.com/games/3d-shapes/ https://wordwall.net/en-us/community/2d-and-3d-shapes-games **Manipulatives :** • Have students use cut outs to make solid figures. • Students use the given solid figures and make a completely new object. • Students make a collage with different shapes and materials.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
attributes, such as sorting by the number of sides or corners. • **Use appropriate vocabulary to describe 2D shapes and 3D objects, such as using the terms "corner" and "vertex" interchangeably or describing a cylinder as having a curved surface and two circular bases.**	**Descriptive Drawings:** Provide students with opportunities to create drawings or diagrams of cubes, cones, cylinders, and spheres, and label the features using appropriate vocabulary. Encourage them to identify and describe the features of these shapes using appropriate vocabulary. Observe their ability to use the correct language. **Projects:** Students design their own shape using local materials and writing its attributes. Students projects are assessed using a rubric. https://www.teachingexpertise.com/classroom-ideas/3d-shapes-projects-ideas-for-kids/ **Performance tasks:** Design performance tasks to be assessed using a rubric such as: Building a specific 3D shape or drawing a 2D shape with a certain number of sides or corners to assess student understanding of attributes and characteristics. • *Creation of a shape book* • *Have students to work collaboratively to create a shape poster.* • *Have students work collaboratively to create a collage of shapes made from different materials.*	• Have students trace the sides and faces of shapes with their fingers. • Have students choose a shape and state attributes of shape. • Students use geoboard to make geometric shapes. • Students are provided with a toy ramp to observe which 3D shapes can roll and which can only slide and categorize them accordingly. • Students are given the opportunity to work with pattern blocks and create other shapes or objects out of them.  **Multimedia :** • Have students write and sing songs about the properties of shape.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	• *Use string or craft wire to create shapes.* • *Have students use rubber band to create the outline of shapes on geoboard* • *Use finger painting to draw shapes.* • *Use ice lollies and matchsticks to make 2D and 3D shapes.* • *Involve students in treasure hunts.* **Formative Assessment Tools:** Use online formative assessment tools that provide instant feedback to assess students' understanding of identifying 2D and 3D shapes. For example, online quizzes or interactive assessments with images of 2D and 3D shapes are provided. Students will be given the opportunity to select the correct 2D shapes or draw on the images to highlight the shapes they identify. **Group or Class discussions:** Foster a collaborative learning environment where students can share their observations and ideas with their peers. Encourage students to explain their reasoning and use appropriate vocabulary (e.g., edges, vertices, sides, circles, triangles) to describe the features of the 3D objects and the resulting 2D shapes. **Verbal Explanations:**	• Students listen to songs and view clippings on geometric shapes. Ask them to identify the rule for the pattern and to extend the pattern. **Group work/Collaborative Learning:** **Shape Sorting Activity:** Divide students into small groups and provide each group with a set of 2D and 3D shapes. Have the students sort the shapes based on specific criteria, such as shape, color, size, number of sides, etc. This activity can help students identify similarities and differences between shapes and improve their sorting skills. **Differentiated Instruction**: Differentiate instruction based on students' individual needs and abilities. Provide additional support or scaffolding for students who may struggle with using appropriate vocabulary and offer extension activities for those who demonstrate proficiency in using the vocabulary. **Patterning Challenge**: Provide groups with a set of 2D and/or 3D shapes and ask them to create a repeating pattern using the shapes. This activity helps

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Students are given the opportunity to describe the attributes and characteristics of 2D shapes and 3D objects. Students are assessed using a rubric. **Digital Drawing Tools:** Students use digital drawing tools, such as drawing apps or online whiteboard platforms, to create their own representations of 2D shapes and 3D shapes and assessed using a checklist. ***Sites for digital drawing*** http://www.tuxpaint.org/download/ https://sketch.io/sketchpad/ https://www.google.com/intl/en_in/drive/apps.html **Real-world object identification:** Provide a variety of real-world objects for students to describe solid shapes. Ask students to identify and name the 2D shapes they can find in given solid shapes. For example, a soccer ball can be used to identify a circle (for the patches) and a sphere (for the overall shape). Monitor students and provide feedback on pupils' ability to transform geometric shapes	students recognize and create patterns and can be extended by challenging their critical thinking skills.

Useful Content Knowledge for the Teacher about the Outcome: (Links to professional sources that *connect back to the Curriculum and Assessment Principles of Learning and Principles of Assessment*)

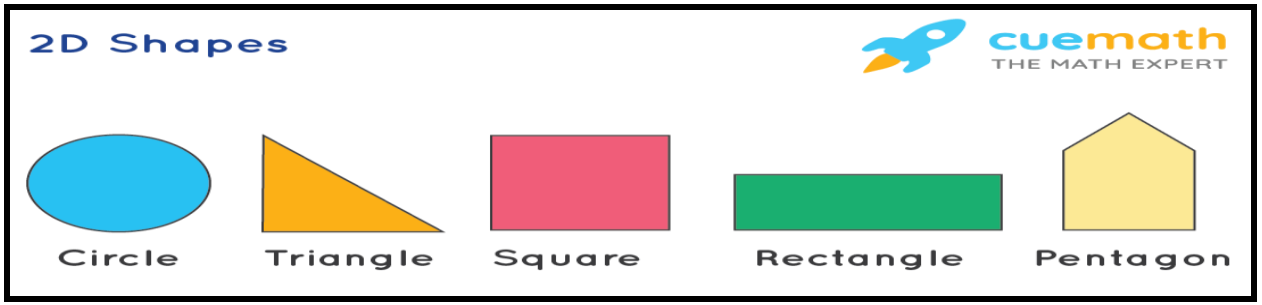
Geometric Shapes

Any object around us with a fixed structure can be considered a geometric shape. These shapes are made up of lines, curves, angles, and surfaces.

In geometry, 2D **shapes** (2 dimensional shapes) can be defined as plane figures that are completely flat and have only two dimensions - length and width. They do not have any thickness and can be measured only by the two dimensions.

A circle, square, rectangle, and triangle are some examples of two-dimensional shapes, and **these shapes can be drawn on paper.**

All the 2-dimensional shapes have sides, vertices (corners), and interior angles, except for the circle, which is a curved figure. 2D shapes with at least three straight sides are called **polygons** and these include triangles, squares, and rectangles.

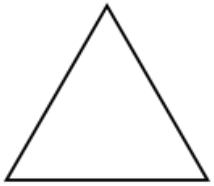
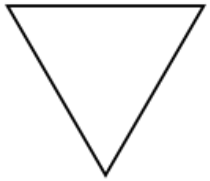


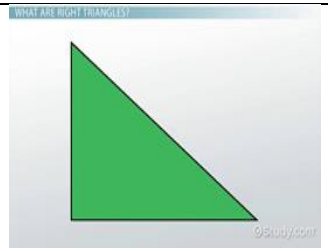
https://www.cuemath.com/geometry/2d-shapes/

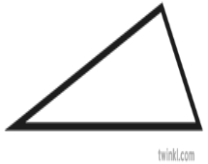
Two-Dimensional Geometric Shapes

Show both 2D and 3D shapes of different size, colour and orientation and position

Triangle:

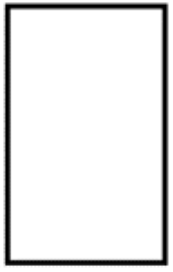
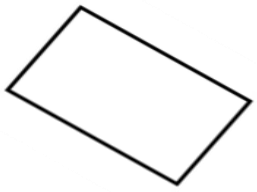
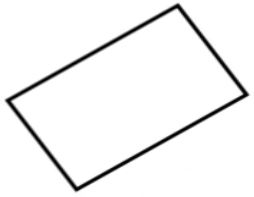
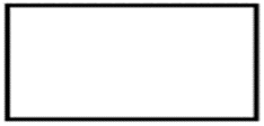


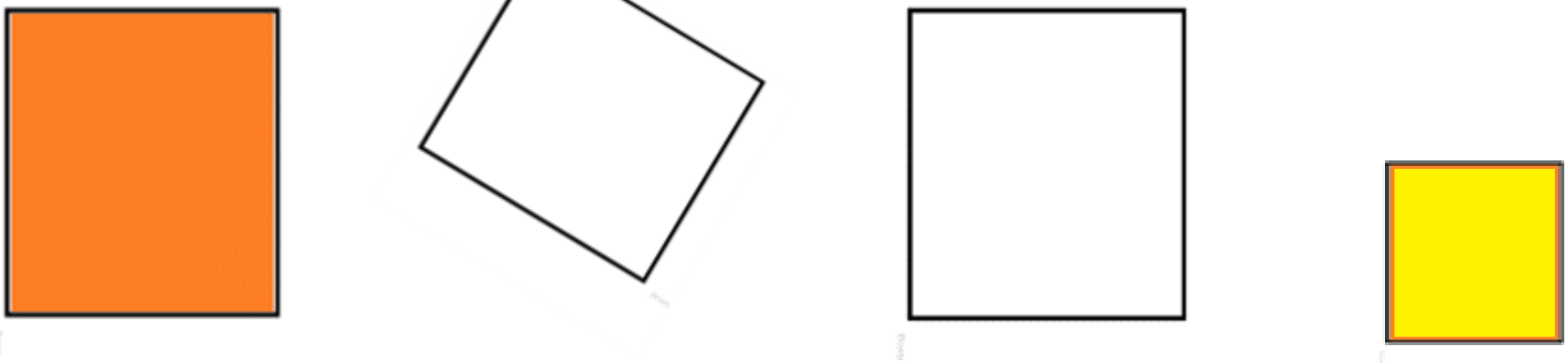


Rectangle:

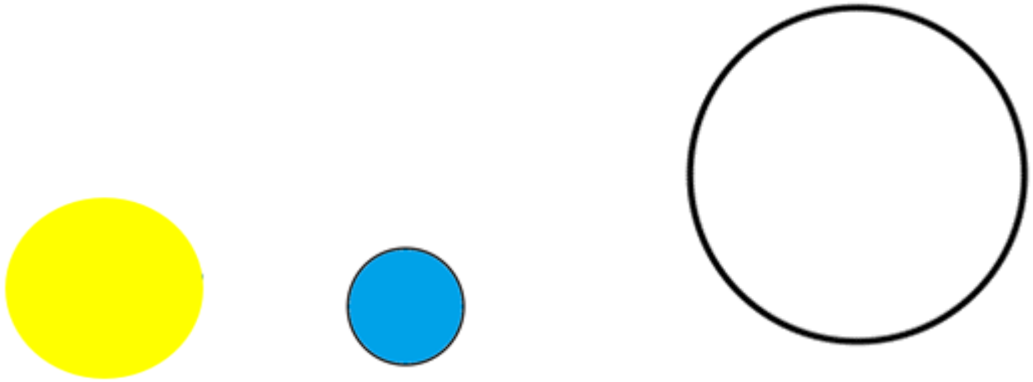
SQUARE:





CIRCLE:

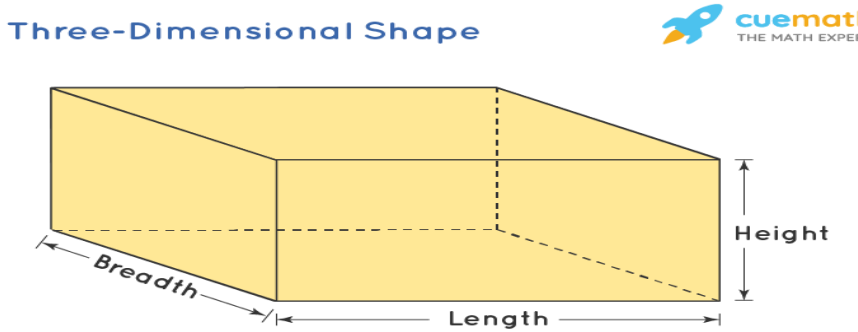


- Triangle: A triangle is a closed two-dimensional geometric shape with three sides.
- Square: A square is a two-dimensional geometric shape that is formed by four sides of equal length.

- Rectangle: A rectangle is a four-sided, two-dimensional geometric shape in which the length of the opposite sides is equal. For example, laptop screens, etc.
- Circle: A circle is a closed two-dimensional geometric figure that is round in shape. A circle does not have any lines or corners.

Solid Shapes

Solid shapes are nothing but solids that consist of 3 dimensions, namely length, breadth, and height. Solid shapes are also known as Space figures and 3D shapes.



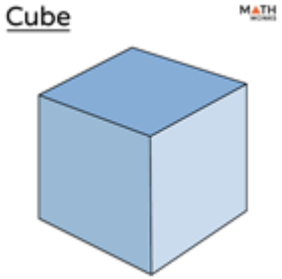
Types of solid shapes-

- Sphere

- **Cylinder**

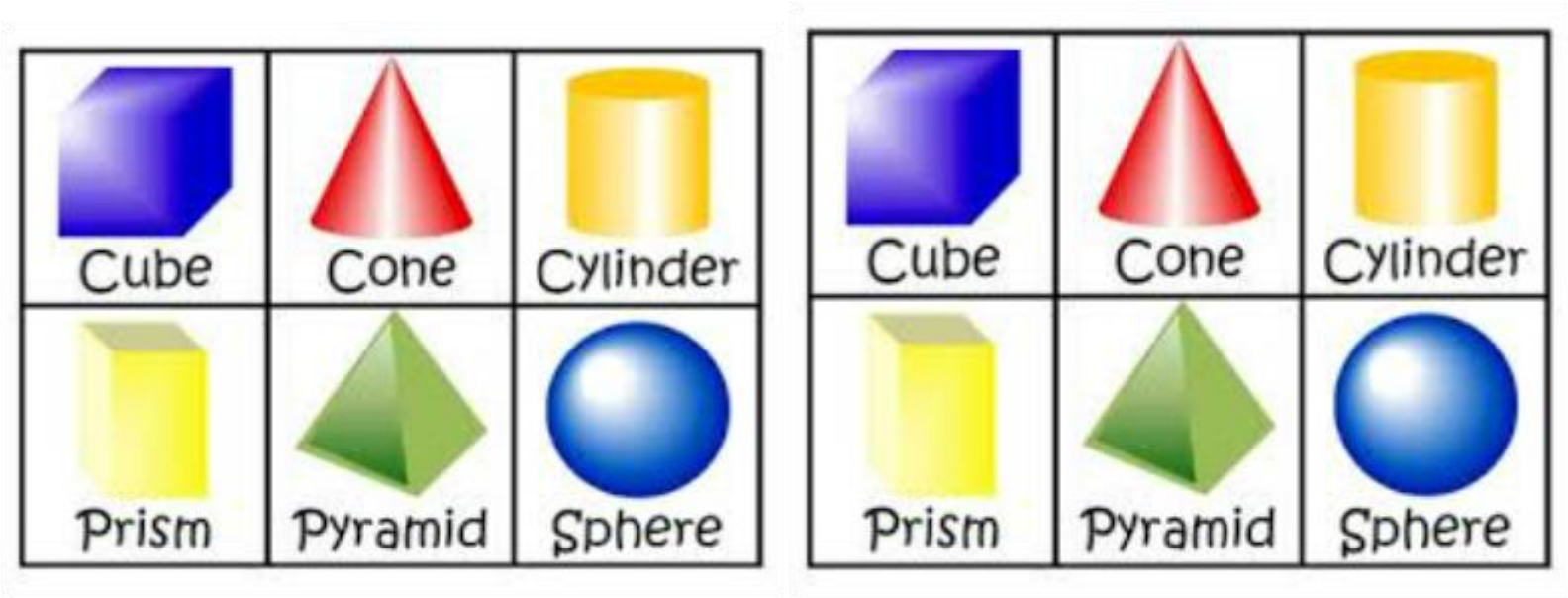
- **Cone**

- Cube



- Cuboid

- **Cube**: a shape with six square faces that are all the same size.
- **Sphere**: a round shape that has no corners or edges.
- **Cylinder**: a shape with two circular faces that are the same size and a curved surface that connects them.
- **Cone:** a shape with a circular base and a pointed top.



http://smal1fan.weebly.com/3d-geometry.html

Inclusive Resources and Materials from Regional Specialists (texts, family &community knowledge and resources, contextually relevant professional web resources)

Manipulatives: such as pattern blocks, tangrams, geoboards, and attribute blocks .

Visual aids: Pictures, diagrams, and posters can be used to help students visualize and understand geometric concepts. For example, a diagram showing the different parts of a two-dimensional shape can help students learn the appropriate vocabulary to describe shapes.

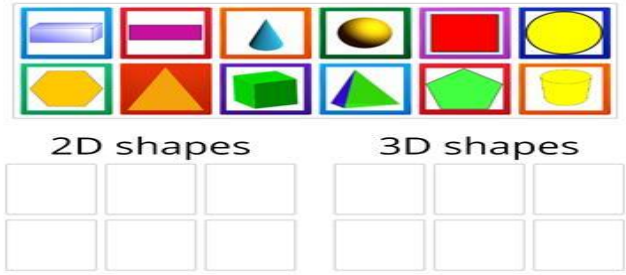
Interactive whiteboards and digital tools: Interactive whiteboards and digital tools such as iPads and laptops can be used to engage students in interactive activities and games that promote spatial sense.
Books and literature: Books and literature that incorporate geometric concepts can help students connect math learning to the real world. For example, a story about building a house might involve identifying and sorting shapes to create the structure.
Picture books: Picture books that feature geometric shapes and patterns can help students connect math concepts to real-world contexts.
Graphic organizers: Graphic organizers such as Venn diagrams and T-charts can be used to help students compare and contrast different shapes and objects. For example, a T-chart could be used to compare the attributes of a cube and a cylinder.
Sentence frames: Sentence frames can be used to support students in using appropriate language to describe shapes and objects. For example, a sentence frame might be "The shape of the window is a ____ because it has ____ sides."
Videos: use of children shows which contain geometric shapes.
Outdoor exploration: Students explore their environment can provide opportunities to develop spatial sense. For example, students might identify and describe the shapes they see in nature, such as the round shape of a flower or the triangular shape of a mountain.

Additional Resources and Materials Books
Worksheets
Board games
Wheels

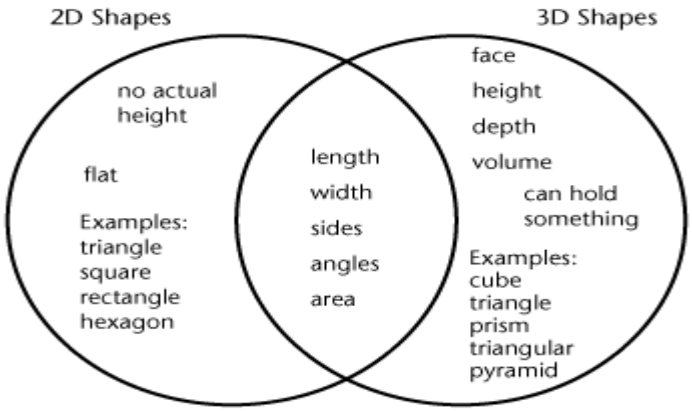
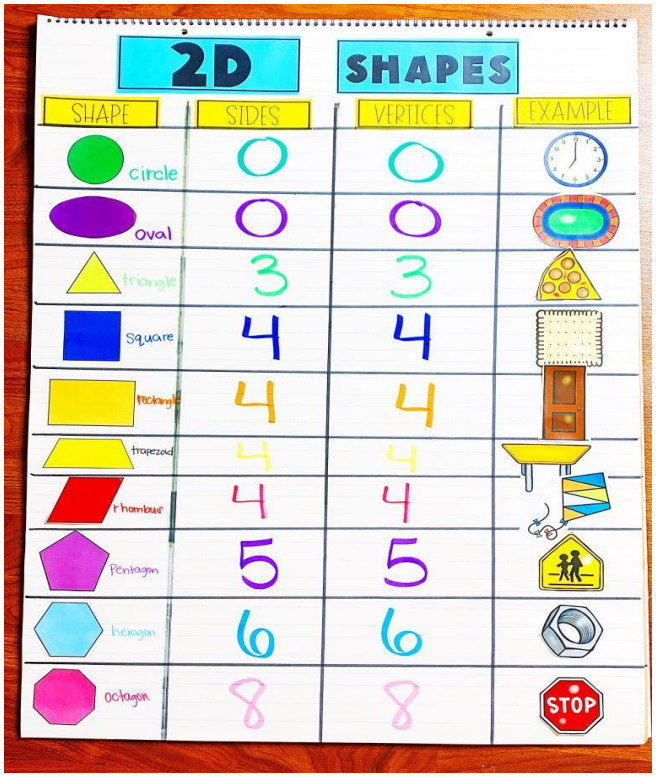
Opportunities for Subject Integration: *(How the inclusive learning strategies might be adapted and/or applied to include other subjects in the curriculum)*
Language
Make a shape book.
Use adjectives to describe shape. For example. The square is big. The yellow triangle is sm*all*.
Science
Identify and name the shape of objects in their natural environment.
Sort and classify objects based on their shapes.
Art
Do finger painting to create shapes.
Use colour code to colour each shape
Social Studies
Students should be able to identify different shapes of important buildings and signs in their environment

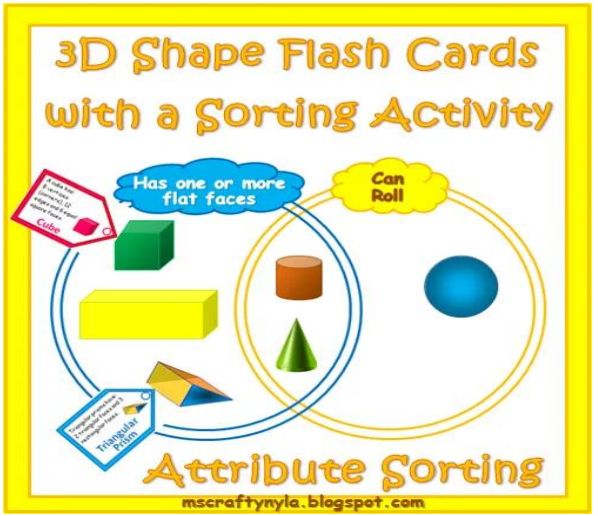
Introduction to the Subject: Geometry is one of the oldest branches of mathematics and is concerned with the study of shapes, sizes, and positions of objects in space. Our world is filled with shapes and objects of different designs; therefore, a deep understanding of geometric thinking is important. Geometric thinking is an essential skill that involves visualizing, analyzing, and manipulating shapes, objects, and space. It is a critical skill that students need to develop to understand many mathematical concepts and to solve real-world problems. To develop geometrical thinking students should observe pictures, diagrams and models, participate in hands-on activities, provided with the opportunity to make real -life connections, collaborative learning and opportunities to engage in technological activities.
Strand (Topic): Geometrical Thinking
Essential Learning Outcome 2.2: Recognizing, Naming and Describing Shapes - Naming 2D & 3D shapes
Grade Level Expectations: Recognize, name and classify 3D objects (specifically cube, cone, cylinder, sphere) and 2D shapes

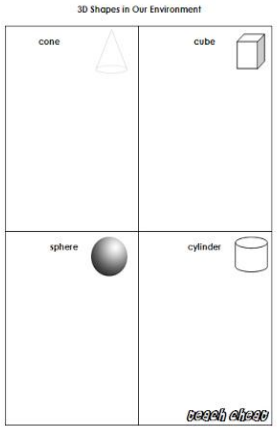
Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **Identify and name 2D shapes: Students should be able to recognize and name basic 2D shapes such as squares, rectangles, circles, triangles, and hexagons.** • **Identify and name 3D objects: Students should be able to recognize and name basic 3D objects such as**	***Shape hunt:*** *Take the students on a shape hunt around the classroom or school. Give them a list of 2D and 3D shapes to find, such as circles, squares, triangles, rectangles, spheres, cubes, and cylinders. Have them identify and name each shape they find.* **Verbal questioning:** Ask open-ended questions that prompt students to identify and name 2D shapes. For example, "*Can you point to the shape that has four sides of equal length and four right angles?"* or *"What is the name of the shape that has one curved side and no corners?"* Ask open-ended questions that prompt students to identify and name 3D objects. For example, *"What is the name of the*	**Multisensory Learning:** Use a variety of sensory experiences to engage students, such as touching and feeling objects, listening to music, and drawing. For example, students could use their fingers to trace shapes in sand or create shapes using playdough. Students could use their hands to feel the different faces of a cube or create 3D objects using playdough.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
cubes, cones, cylinders, and spheres. *Apply knowledge of 2D and 3D shapes in practical contexts, such as solving problems involving shape and space, with support appropriate to their individual needs.* • **Sort 2D shapes based on their attributes, such as the number of sides, the length of sides, and the number of angles.** • **Sort 3D objects based on their attributes, such as the number of faces, edges, and vertices.** • **Compare and contrast 2D shapes and 3D objects identifying similarities and differences between 2D shapes and 3D objects, such as the number of dimensions and the**	*object that has a round base and a pointed top?"* or *"Can you name the object that has six square faces?"* **Game-based assessments:** Use games that involve identifying and naming 2D or 3D shapes, *such as shape memory or shape bingo.* These games can make assessment more fun and engaging for students while still allowing you to observe their skills. **Observation:** Observe students as they participate in group activities or independent work that involve sorting 2D shapes and 3D objects based on their attributes. Take note of their ability to identify and sort objects correctly.  **Verbal questioning:** Ask open-ended questions that prompt students to sort 2D shapes and 3D objects based on their attributes. For example, *"Can you sort these shapes based on the number of sides?"* or *"How would you sort these objects based on the number of vertices?"*	  Use shapes to make impressions in playdough. **Universal Design for Learning** (UDL): Use UDL principles to create multiple ways for students to access and engage with the material. *For example, provide audio descriptions of shapes for students who are visually impaired or provide hands-on activities for students who have difficulty with verbal communication.* **Technology Integration:** Use technology such as tablets or interactive whiteboards to engage students in identifying and naming shapes. *For example, students*

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
presence of faces, edges, and vertices. • **Create 2D shapes and 3D objects using various materials, such as paper, clay, and blocks.** • **Use mathematical vocabulary related to shapes, such as vertices, edges, faces, and symmetry.** • **Identify and describe real-world objects that are 2D shapes or 3D objects, such as circles on a clock face or a cone-shaped ice cream cone.** • **Solve basic geometric problems involving 2D shapes and 3D objects, such as counting the number of faces on a cube or sorting 2D shapes based on their attributes.**	**Hands-on activities:** Provide students with hands-on activities such as manipulatives or shape and object models that require them to sort based on attributes. Observe their ability to use the materials to correctly sort objects. **Game-based assessments:** Use games that involve sorting 2D shapes and 3D objects based on their attributes, such as attribute matching or attribute bingo. These games can make assessment more fun and engaging for students while still allowing you to observe their skills. **Venn diagram.** Draw two overlapping circles on the board, one labeled "2D Shapes" and the other labeled "3D Objects." Ask students to name different shapes and objects and place them in the appropriate circle based on their dimensions. Encourage them to explain why they placed the shape or object in that circle.	*could use an app that allows them to trace shapes on a touchscreen.* *Students could also use an app that allows them to rotate a 3D object on a touchscreen.* **Attribute charts:**. Provide students with examples of each shape/object and have them identify and label the attributes on the charts. Allows students to create attribute charts for 2D shapes and 3D objects that display the different attributes such as number of sides, angles, edges, vertices, etc

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 **Sort:** Provide students with a set of pictures of 2D shapes and 3D objects and ask them to sort them into two categories based on their dimensions. This could be done individually or in small groups. **Provide clear instructions**: Provide students with clear and concise instructions on how to create the shapes and objects using the materials provided. Use visual aids and demonstration to help students understand the steps. **Observe and document progress:** Observe students as they work and take notes on their progress. This will help you to identify areas where students may need additional support or guidance.	 **Attribute matching:** Create a matching game where students match the 2D shape or 3D object with its corresponding attributes. *For example, match a square with the attribute "4 sides, 4 angles."*

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Consider different learning styles: Provide different options for creating shapes and objects, such as drawing, sculpting, or building with blocks. This will help students with different learning styles to demonstrate their understanding. **Hands-on activities:** Providing hands-on activities like building with blocks or playing with 3D shapes can be an effective way to help students understand and identify real-world objects. Observe their interactions with the objects and listen to their verbal descriptions to assess their understanding. **Verbal assessments:** Engaging students in conversation about real-world objects can help you assess their understanding. You can ask them to describe a familiar object or use open-ended questions to prompt discussion about the properties of shapes and objects. **Interactive assessments:** Games and activities like scavenger hunts or sorting games can be a fun way to assess students' ability to identify and describe real-world objects. *For example, you could ask students to find objects around the classroom that are a certain shape or ask them to sort objects by shape.*	**Attribute sorting:** Provide students with a set of 2D shapes or 3D objects and have them sort them into groups based on a specific attribute. *For example, have them sort 2D shapes based on the number of sides or 3D objects based on the number of faces or other attributes.*  **Attribute scavenger hunt:** Hide 2D shapes or 3D objects around the classroom or outdoor area and provide students with a list of attributes to find. *For example, "Find an object with 4 sides and 4 angles."* **Real-world application:** Provide students with opportunities to see 2D shapes and 3D objects in real-life situations. For example, have them identify shapes

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		in the classroom or during a nature walk or have them identify 3D objects in their homes.   **Visual aids:** Use posters, flashcards, and real-life objects to help students visualize and understand the differences between 2D shapes and 3D objects. Use videos and animations to show how these shapes and objects look in the real world. **Language and communication aids:** Use clear and concise language, visual aids, and gestures to help students understand new concepts. Encourage students to use pictures, drawings, and symbols to express their ideas and understanding.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		Provide multiple materials: Provide a variety of materials for students to create their 2D shapes and 3D objects, such as paper, clay, cardboard, and blocks. This will help to cater to different learning styles and preferences. Use real-life examples to help students understand how 2D shapes and 3D objects can be used and created. *For example, you can use pictures of buildings or bridges to show how 3D shapes can be used in construction*. **Provide guidance and support:** Provide students with guidance and support as they create their shapes and objects. This can include demonstrations, step-by-step instructions, and feedback on their work. **Visual aids:** Incorporating visual aids like diagrams, pictures, and videos can help students better understand and describe real-world objects. Use visual aids to introduce new concepts, reinforce learning, and provide opportunities for students to practice identifying and describing objects. **Multisensory learning:** Incorporating different senses into learning activities can help students with diverse learning needs. Provide opportunities for students to touch, smell, and taste objects (if

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		appropriate), in addition to looking at them and describing their properties.

Useful Content Knowledge for the Teacher about the Outcome: (Links to professional sources that *connect back to the Curriculum and Assessment Principles of Learning and Principles of Assessment*)

2D SHAPES

1. Circle: A shape with no corners or angles, and all points on the boundary are at an equal distance from the center.
2. Square: A shape with four equal sides and four right angles.
3. Rectangle: A shape with four sides where the opposite sides are equal in length and parallel, and all angles are right angles.
4. Triangle: A shape with three sides and three angles.
5. Pentagon: A shape with five sides and five angles.
6. Hexagon: A shape with six sides and six angles.
7. Octagon: A shape with eight sides and eight angles.
8. Rhombus: A shape with four equal sides, where opposite sides are parallel, and opposite angles are equal.

SOLID SHAPES

1. Cube: A solid object with six square faces that are all the same size.
2. Cone: A solid object with a circular base and a curved surface that tapers to a point at the top.
3. Cylinder: A solid object with two circular bases that are parallel and the same size, connected by a curved surface.
4. Sphere: A solid object with a curved surface that is the same distance from its center point at all points, creating a round shape.

Inclusive Resources and Materials from Regional Specialists (*texts, family &community knowledge and resources, contextually relevant professional web resources*)

Additional Resources and Materials

Khan Academy - Khan Academy is a free online learning platform that offers a variety of math courses. They have a course on geometry that covers 2D and 3D shapes.

Math Games - Math Games is a website that offers free math games for learners of all ages. They have a section on geometry that includes games to help learners identify and classify 2D and 3D shapes.

IXL Learning - IXL Learning is a paid online learning platform that offers math courses for learners of all ages. They have a section on geometry that covers 2D and 3D shapes, and includes interactive exercises and quizzes.

YouTube - YouTube has a wide variety of videos on geometry, including videos that cover 2D and 3D shapes. Some popular channels to check out include Math Antics, Numberphile, and Crash Course.

Mathway - Mathway is a website and app that offers step-by-step solutions to math problems, including problems involving 2D and 3D shapes. This can be a helpful resource for learners who are struggling to understand a particular concept.

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

1. **Science:** In science, students can explore how 2D and 3D shapes are used in the natural world, such as the shape of a leaf or the structure of a crystal. They can also investigate how shapes affect the properties of objects, such as the buoyancy of a boat or the strength of a building.
2. **Art:** In art, students can use 2D and 3D shapes to create their own works of art. They can explore how different shapes and colors can be combined to create different effects and patterns. They can also learn about the use of shapes in different art styles, such as geometric abstraction.
3. **Language Arts:** In language arts, students can use 2D and 3D shapes to develop their vocabulary and language skills. They can describe objects using shape-related adjectives and use shapes to create their own stories or poems. They can also use shapes to practice letter and word recognition.
4. **Social Studies**: In social studies, students can explore how shapes are used in different cultures and traditions, such as the use of geometric patterns in Islamic art. They can also investigate how shapes are used in different professions, such as architecture or engineering.

Technology:

Digital Games: There are many digital games available that focus on identifying and naming 2D and 3D shapes, such as shape matching games or shape building games. These games can be accessed on tablets or computers and can provide a fun way for students to practice their skills.

Interactive Whiteboards: Interactive whiteboards can be used to display 2D and 3D shapes in a large format, making it easier for students to see and interact with them. Teachers can use these whiteboards to draw shapes and highlight their properties, and students can use them to practice drawing and naming shapes.
Augmented Reality: Augmented reality apps can provide a 3D visualization of 2D and 3D shapes. Students can use mobile devices or tablets to view shapes in augmented reality, allowing them to see the shapes from different angles and perspectives.
Virtual Reality: Virtual reality can provide an immersive experience for students to explore 3D shapes. Virtual reality headsets can be used to view 3D shapes in a three-dimensional environment, allowing students to interact with them in a more realistic way.
Shape Building Apps: There are many apps available that allow students to build 2D and 3D shapes using virtual blocks or shapes. These apps can provide a hands-on way for students to explore the properties of shapes and practice building and identifying them.

Elements from Local Culture: *(References that learners might know from their local environment*
Artwork – There is a rich local tradition of colorful and vibrant art, including geometric patterns and shapes. Use local artwork as examples of 2D shapes and ask students to identify and name the shapes they see in the artwork.
Architecture – Local architecture is often characterized by unique and intricate designs, many of which incorporate geometric shapes. Take students on a field trip to observe and identify the 2D and 3D shapes they see in local buildings.
Fruits and vegetables – Local fruits and vegetables come in a variety of shapes and sizes and can be used as a fun and interactive way to teach 2D and 3D shapes. For example, students can sort and categorize fruits and vegetables based on their shape and size.
Musical instruments - Music is known for its rhythmic and percussive sounds, often created using a variety of instruments with different shapes and sizes. You can use local musical instruments as examples of 3D shapes and ask students to identify and name the shapes they see.
Carnival costumes - Caribbean carnivals are known for their elaborate and colorful costumes, many of which incorporate different shapes and patterns. You can use local carnival costumes as examples of 2D and 3D shapes and ask students to identify and name the shapes and patterns they see.

Resources for a learner who is struggling: *(Links to earlier learning activities for similar knowledge, links to resources for special education needs)*
Education.com - Education.com has a variety of free resources for learning shapes, including printable worksheets, interactive games, and activities.
PBS Kids - PBS Kids has a variety of games and videos that can help young learners with shape recognition, such as "Shape Quest" and "Cyberchase Shape Quest."
Funbrain - Funbrain has a section on shapes that includes interactive games and quizzes, such as "Shape Invasion" and "Shape Surveyor."
ABCya - ABCya has a variety of educational games for young learners, including games that teach 2D and 3D shapes, such as "Shape Match" and "Shape Invasion."
YouTube - YouTube has many educational videos that teach 2D and 3D shapes. Some channels that may be helpful for grade 1 learners include Super Simple Songs, KidsTV123, and Have Fun Teaching.

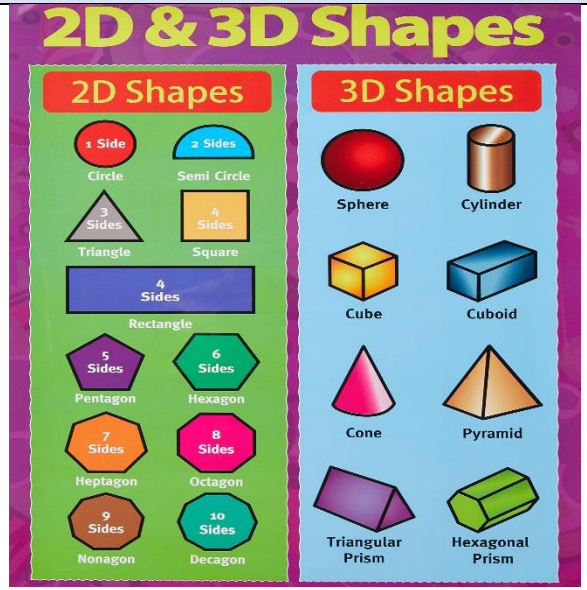
Manipulatives - Manipulatives are physical objects that can be used to build and explore shapes. Some examples of manipulatives that can be used for teaching 2D and 3D shapes include pattern blocks, tangrams, geoboards, and 3D shape blocks.
Whiteboard or Chalkboard - A whiteboard or chalkboard can be used to draw and label shapes, as well as to work through problems and examples with the learner.
Flashcards - Flashcards can be used to help learners memorize and recognize the names and characteristics of different shapes. For example, a flashcard might have a picture of a circle on one side and the word "circle" on the other side.
Worksheets - Worksheets can be used to reinforce the concepts learned through direct teaching. Worksheets might include activities such as coloring or tracing shapes, identifying shapes in pictures, or matching 3D shapes to their names and attributes.
Posters and Charts - Posters and charts can be used to provide visual aids and reminders for learners. For example, a poster might have pictures of common 2D and 3D shapes with their names and attributes listed.

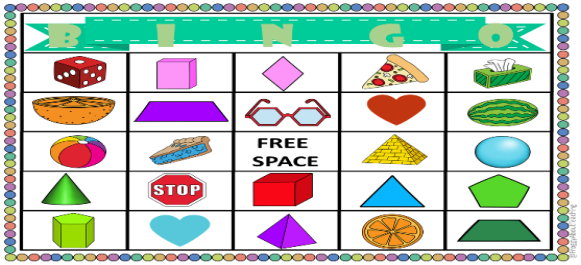
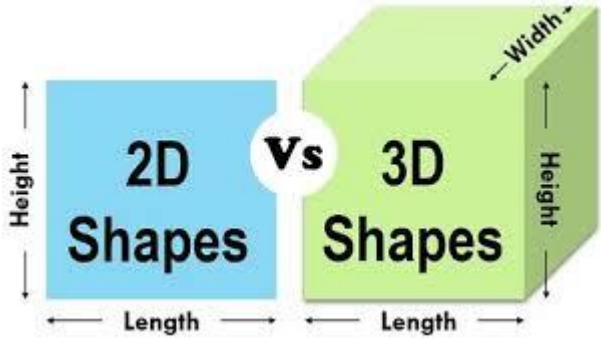
Resources for a learner who needs challenge: *(Links to learning activities and resources in later grades)*
Virtual Reality (VR) Tools - VR tools can provide a highly interactive and immersive learning experience for learners. Some VR tools focus on teaching geometry and shapes, allowing learners to explore 2D and 3D shapes in a virtual environment.
3D Printing - 3D printing technology can be used to create physical models of 2D and 3D shapes. This can allow learners to explore the shapes in a tangible way and gain a deeper understanding of their attributes and properties.
Advanced Worksheets - For learners who need a challenge, worksheets that involve higher-level thinking skills can be helpful. These might include activities such as identifying the properties of irregular shapes, creating composite shapes from smaller shapes, or solving geometric puzzles.
Games and Challenges - Games and challenges can be a fun and engaging way to challenge learners who are ready for a more advanced level of learning. Some examples of games and challenges that focus on shapes include Tangram puzzles, 3D shape building challenges, and shape recognition games.
Project-Based Learning - Project-based learning can provide a more challenging and in-depth learning experience for learners who are ready for it. For example, learners might be tasked with designing and building a structure using only 2D and 3D shapes, or creating a digital model of a complex 3D shape using software tools.

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):

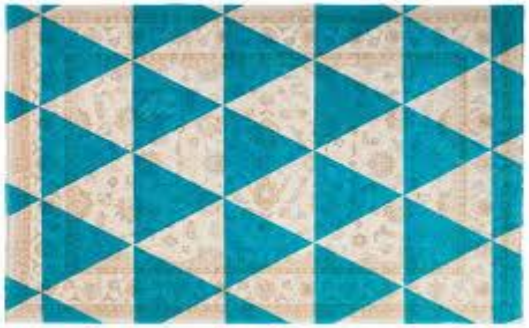
Introduction to the Subject: Geometry is one of the oldest branches of mathematics and is concerned with the study of shapes, sizes, and positions of objects in space. Our world is filled with shapes and objects of different designs; therefore, a deep understanding of geometric thinking is important. Geometric thinking is an essential skill that involves visualizing, analyzing, and manipulating shapes, objects, and space. It is a critical skill that students need to develop to understand many mathematical concepts and to solve real-world problems. To develop geometrical thinking students should observe pictures, diagrams and models, participate in hands-on activities, provided with the opportunity to make real -life connections, collaborative learning and opportunities to engage in technological activities.
Strand (Topic): Geometrical Thinking
Essential Learning Outcome 2.3: Recognizing, Naming and Describing Shapes – Describing relationships between and among shapes
Grade Level Expectations: Identifying and naming 2D and 3D shapes. Defining 2D and 3D shapes. Highlighting the attributes of 2D shapes (square, rectangle, circle triangle). Highlighting the attributes of 3D shapes (cube rectangular prism, cone, cylinder) Compare given geometric shapes according to sides, faces and corners.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **Identify the basic shapes, such as circle, square, rectangle, and triangle.** • **Create and explore with different materials such as playdough, blocks, foam to form different shapes.** • **Find shapes in the environment such as in buildings, signs, or everyday objects.** • **Sort shapes based on their attributes.**	**Questioning:** Ask students questions about shapes, objects, and how they are related to assess their understanding of the concepts. **Verbal Assessment** Ask students to describe the shapes they see, using their own words. This allows them to use their creativity and helps build their confidence in verbal expression. Ask students to use manipulatives such as blocks and play dough to create geometric shapes and describe them to you.	**Use visual aids:** Visual aids such as pictures, posters, and diagrams can help students to recognize and name geometric shapes. Use colorful images that clearly show the shape and label it with its name.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **Identify and create patterns using geometric shapes.**	**Visual Aids** Use pictures and diagrams to help students identify different shapes. Show them real-life objects and ask them to identify the shapes within them. You can also use flashcards with shapes printed on them. **Collaborative Learning** Encourage students to work together in small groups to identify and describe shapes. This allows for peer-to-peer learning and gives students the opportunity to practice their communication and social skills. **Individualise Learning** Provide students with individualized learning plans that cater to their specific needs. For example, some students may benefit from visual aids while others may need more hands-on activities. **Games**	 **Verbal instructions**: When introducing a new shape, provide clear and concise verbal instructions. Use simple language and avoid using technical terms that might be confusing for young learners. • *A triangle has three straight sides and three angles.* • *A rectangle has four straight sides and four right angles (90-degree angles).* • *A circle is a round shape with no corners or angles.* • *A square has four equal straight sides and four right angles (90-degree angles).*

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Use games such as shape ***bingo*** or memory matching games to make learning more engaging and fun for students.  **Observation** Observe students on task as they interact with different geometric shapes. Observe students as they categorize geometric shapes according to their attributes.  **Shape sort** *Materials*	• *A pentagon has five straight sides and five angles.* **Hands-on activities**: Hands-on activities, such as building shapes with blocks or using pattern blocks to make shapes, can help students to understand the properties of geometric shapes. Students can manipulate the shapes and explore their characteristics. **Group activities:** Group activities can help to foster a collaborative learning environment where students can learn from each other. Students can work together to identify and describe shapes, or play games that involve recognizing shapes. **Real-world examples:** Use real-world examples of geometric shapes to help students understand their relevance and application. *For example, point out shapes in buildings or in nature.* https://www.youtube.com/watch?v=ZnZYK83utu0 **Multi-sensory learning:** Use a variety of sensory experiences to reinforce learning. For example, students can touch and feel the different sides and angles of a shape or listen to a song or ***rhyme*** that helps them to remember its name and characteristics.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	• Various 2D and 3D shapes (e.g. circle, square, triangle, rectangle, cube, cylinder, sphere, cone) • A large sheet of paper with two sections labeled "2D shapes" and "3D shapes" *Instructions:* Show the students the different 2D and 3D shapes and ask them to name each one. Explain to the students that they will be sorting the shapes into two categories: 2D shapes and 3D shapes. Demonstrate how to sort the shapes by placing a circle, square, triangle, and rectangle in the "2D shapes" section, and a cube, cylinder, sphere, and cone in the "3D shapes" section. Have the students take turns sorting the shapes into the correct section. You can use a timer to make it more engaging and challenging for the students. After all the shapes have been sorted, review each section with the class to ensure accuracy. ***Assessment:*** Observe the students as they sort the shapes and take note of any difficulties they may have. You can also ask the students to explain why they sorted certain shapes into a particular category. This will help you assess their understanding of 2D and 3D shapes and sorting.	***Example of a rhyme*** ***2D Shapes:*** *Circle, circle, round and round No corners or edges to be found* *Squares are like a box or tile Four sides and corners make them smile* *A triangle has angles three Count them with me, one, two, three* *Rectangles are like squares stretched wide Two short sides and two long sides* *Pentagon, oh pentagon, a shape so bold Five sides and angles, it never gets old* ***3D Shapes:*** *A sphere is like a ball or globe Round and curvy, it's a fun shape to probe* *A cube has six faces, all the same It's like a box, a perfect little game* *A cone has one point and a circle base It's like a party hat, a fun shape to trace* *A cylinder is like a can or tube Round and long, it's a fun shape to cube* *Pyramids are pointy on top A shape so strong, it will never flop*

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		

Useful Content Knowledge for the Teacher about the Outcome:

A 3D shape is a solid object that has three dimensions: length, width, and height. It is not flat like a 2D shape, but has depth and can be held in your hand. Examples of common 3D shapes include cubes, spheres, cylinders, cones, and pyramids

Cube

- Has 6 square faces
- All sides are equal in length
- Has 8 vertices (corners)

Examples of cube found in our environment: dice, sugar cubes, Rubik's cube

https://www.vectorstock.com/royalty-free-vector/blue-smart-cube-icon-isometric-style-vector-26803260

Sphere

- Looks like a ball
- Has no faces, edges, or vertices
- Has a curved surface

Examples of Spheres found in our environment: balls, oranges, globes.
https://www.google.com/search?q=images+of+a+sphere&rlz=1C1GCEA_enGD937GD937&sxsrf=APwXEdf8sb7_4xrrSh29-2JuGcVvM5rrBA%3A1680618080970&ei=YDIsZIHyOq_LwbkPwMqUiAo&oq=images+of+a+s&gs_lcp=Cgxnd3Mtd2l6LXNlcnAQARgAMggIABCKBRCRAjIFCAAQgAQyBQgAEIAEMgUIABCABDIFCAAQgAQyBQgAEIAEMgUIABCABDIFCAAQgAQyBQgAEIAEMgUIABCABDoKCAAQRxDWBBCwAzoECCMQJzoGCAAQFhAeOg0IABAWEB4QDxDxBBAKOggIABAWEB4QCkoECEEYAFD5MVjLSWCQYGgBcAF4AIABogGIAZkFkgEDMC41mAEAoAEByAEIwAEB&sclient=gws-wiz-serp#imgrc=-OUfPctD-OvVcM

Cylinder

- Looks like a can
- Has 2 circular faces
- Has a curved surface
- Has no vertices

Examples of Cylinders found in our environment soda cans, water bottles, candles, pencils
https://www.google.com/search?q=image+of+cylinder&rlz=1C1GCEA_enGD937GD937&sxsrf=APwXEdc3Sf86OdZKz6KozRTdpROE14BdZA%3A1680618579086&ei=UzQsZOX3BPeGwbkP9tKhqAc&oq=images+of+a+sphere&gs_lcp=Cgxnd3Mtd2l6LXNlcnAQARgEMgoIABBHENYEELA

Cone

- Looks like an ice cream cone
- Has 1 circular face
- Has a curved surface that tapers to a point
- Has 1 vertex (the pointy end)

- Examples of Cones found in our environment: ice cream cones, traffic cones, party hats.

https://www.google.com/search?q=image+of+cone&rlz=1C1GCEA_enGD937GD937&sxsrf=APwXEdfiQuHUF-JEolkU0s8sVihTd2mt1A%3A1680620075512&ei=KzosZNP0HueTwbkPmuyD

Cuboid (Rectangular Prism

- Looks like a box
- Has 6 faces, all rectangles
- Opposite faces are equal in size
- Has 8 vertices (corners)
- Examples of Cuboid found in our environment

https://www.google.com/search?q=images+of+cuboid&rlz=1C1GCEA_enGD937GD937&oq=images+of+cuboid&aqs=chrome..69i57j0i512l4j0i22i30l5.20283j0j7&sourceid=chrome&ie=UTF-8#imgrc=nYM9v03ngrNuaM

What is a 2D shape?

A 2D shape is a flat shape that has two dimensions: length and width. It does not have any thickness or depth. Examples of 2D shapes include circles, squares, rectangles, triangles, and hexagons. These shapes can be found in many everyday objects, such as signs, toys, and buildings.

1. Square: A square is a shape with four sides that are all the same length and four corners that are all right angles.
2. Circle: A circle is a shape that has no corners and is completely round.
3. Triangle: A triangle is a shape with three sides and three corners.
4. Rectangle: A rectangle is a shape with four sides, where the opposite sides are parallel and the angles at each corner are all right angles.
5. Oval: An oval is a shape that is like a stretched-out circle, with no corners and a curved shape.
6. Pentagon: A pentagon is a shape with five sides and five corners.
7. Hexagon: A hexagon is a shape with six sides and six corners.
8. Octagon: An octagon is a shape with eight sides and eight corners.

Inclusive Resources and Materials from Regional Specialists (*texts, family &community knowledge and resources, contextually relevant professional web resources*)

1. **Visual aids** - Use visual aids such as posters, flashcards, or pictures to display different geometric shapes.

2. **Interactive games** - Interactive games, such as matching games, puzzles, or online quizzes, can be a fun and engaging way to help students learn about shapes.
3. **Playdough** - Use playdough or clay to help students create and manipulate different geometric shapes. This can help them develop a tactile understanding of the shapes, and also enhance their fine motor skills.
4. **Storybooks** - Use storybooks that incorporate geometric shapes, such as "The Greedy Triangle" by Marilyn Burns or "Shape by Shape" by Suse MacDonald. These books can be a fun and engaging way to introduce students to different shapes
5. **Collaborative activities** - Engage students in collaborative activities that involve identifying and describing geometric shapes. For example, students can work in pairs to create a shape scavenger hunt, where they search for different shapes around the classroom or school and describe their properties to each other.
and help them understand their properties.
6. **Videos** - There are many educational videos available online that can be used to teach geometry to grade 1 students. For example, the PBS Kids show "Cyberchase" has several episodes that focus on geometric concepts such as symmetry, angles, and tessellations. These videos can be used to supplement classroom instruction and engage students who may be more visually or auditory oriented.
7. **Interactive games** - Interactive games and activities can help students practice and reinforce geometric concepts in a fun and engaging way. For example, the game "Shape Invaders" allows students to practice identifying and naming geometric shapes by shooting down shapes in a space-themed setting. This type of game can be used as a form of formative assessment to gauge students' understanding of geometric concepts
8. **Hands-on manipulatives** - Providing students with hands-on manipulatives such as pattern blocks, tangrams, or geoboards can help them develop spatial reasoning skills and better understand geometric concepts. These manipulatives can also be used to create inclusive activities that promote teamwork and cooperation among students.

Additional Resources and Materials

Geometric shape flash cards
Geometric shape posters
Interactive whiteboard
Shape sorting games
Storybook about shapes
Online resources and websites
Sample models of 3D shapes.

Opportunities for Subject Integration:

Art and Craft:

- Draw and colour geometric shapes..
- Estimate the number of shapes within a pattern.

Represent arrays of geometric shapes through drawing, painting and photography.

Language Arts:

- Use adjectives to describe shapes, patterns, sizes, etc. when estimating.
- Write, discuss and share reasons and explanations for decisions made.
- Make comparisons between geometric shapes.
- Write simple sentences about geometric shapes.
- Create stories involving 3D shapes and 2D shapes.
- Read stories highlighting the attributes of 3D shape and 2D shapes
- Write sentences, rhymes and poems recognizing, naming and describing geometric shapes.

Music:

Singing songs about geometric shapes.

- Show appreciation for peers when working in groups
- Show appreciation for the opinions of others, by listening, and allowing peers to speak.
- Demonstrate listening skills, allowing and taking turns when conversing in groups.
- Play games with mathematical skills for enjoyment and skill development.
- Model sharing geometric shapes created by individual students.

Social Studies:

- Divide work among students working in groups.

Students working cooperatively to complete a given task.

Sharing responsibilities among students within groups.

Science

Categorizing geometric shapes according to number of sides, shape, number of corners, made from straight lines, made from curve lines etc.

Elements from Local Culture: *(References that learners might know from their local environment*
Flags: Use the flags of different Caribbean countries to identify 2D shapes, such as rectangles or triangles, and discuss their attributes, such as the number of sides or angles.
example: A circle could be a pizza or a calypso drum (face of drum for a circle). tile in the house

Resources for a learner who is struggling:
Online videos: There are many online videos available that can help students learn about 3D and 2D shapes. Some good options include:

- PBS Learning Media has a collection of videos about shapes and geometry that are designed for young learners.
- Khan Academy Kids has a series of videos that cover 2D shapes, 3D shapes, and other geometry concepts.
- Math Antics has a video on 2D shapes that explains the basic concepts in an easy-to-understand way.

https://pbskids.org/games
https://pbskids.org/games/shapes
https://www.khanacademy.org/
https://www.adaptedmind.com/Math-Worksheets.html?utm_medium=cpc&utm_source=google&campaignid=835890474&campaign_type=&placement=g&utm_content=
Worksheets and activities: There are many worksheets and activities available that can help students practice recognizing and describing shapes. Some good options include:
Education.com has a variety of worksheets and activities on shapes for grade 1 learners.
Teachers Pay Teachers has a selection of printable activities and worksheets that cover 2D and 3D shapes.
Scholastic has a set of printable activities that help students learn about shapes and geometry.
Games and apps: There are many games and apps that can help students practice recognizing and describing shapes in a fun way.
Manipulatives: Sometimes, students need hands-on experience with shapes in order to fully understand them. Some good manipulatives for teaching shapes include:-

Pattern blocks: These colorful blocks can be used to create and explore 2D shapes.
Geometric solids: These 3D models can help students understand the properties of different 3D shapes.
Tangrams: These puzzles challenge students to create different shapes using a set of seven pieces.

Resources for a learner who needs challenge:

1. Shape Up!" Game: This game helps students learn to recognize and name shapes by matching them to their corresponding names. It can be found on ABCya.com.

2. "Geoboard" App: This app allows students to create shapes on a virtual geoboard using rubber bands. It helps develop spatial awareness and geometric understanding. It can be found on the App Store or Google Play.

3."Pattern Blocks" Manipulatives: These manipulatives are available in both physical and digital formats and help students learn about shapes and patterns through hands-on exploration.

4."Exploring Shapes" Worksheets: These worksheets provide opportunities for students to practice identifying and describing the attributes of shapes. They can be found on education.com or teacherspayteachers.com.

5.Shape Explorer" Book: This book provides a comprehensive overview of geometric shapes, including their attributes and real-world examples. It can be found on Amazon or at your local library.

6.**"Geometry for Kids" Videos:** These videos provide engaging explanations of geometric concepts in a way that is easy for young learners to understand. They can be found on YouTube or Khan Academy Kids.

7.**"Math Playground" Games:** This website offers a variety of games that help students practice recognizing and describing geometric shapes in a fun and interactive way.

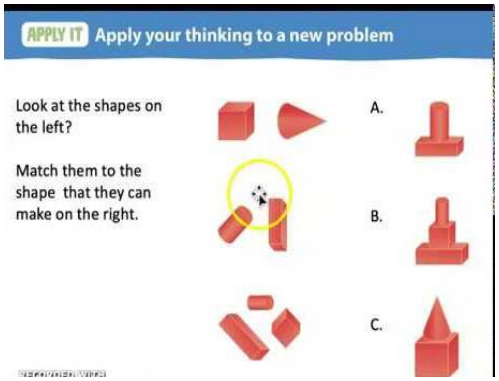
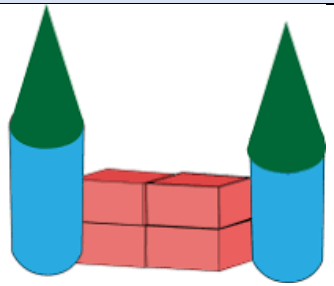
Strategies that Support the Curriculum and Assessment Framework

1. **Use real-life examples:** Use real-life objects and situations to introduce geometric shapes to students. For example, use a pizza to introduce the concept of a circle, a box to introduce the concept of a rectangle, or a cone to introduce the concept of a cone.
2. **Hands-on activities:** Provide students with hands-on activities such as building with blocks or creating geometric shapes with playdough. This will help them visualize and understand the different shapes.
3. **Visual aids:** Use visual aids such as posters or flashcards to help students recognize and name different shapes. You can also use videos and interactive software to help students understand geometric concepts.
4. **Games**: Incorporate games into your lessons to make learning fun and engaging. For example, play a game of "I Spy" where students have to find shapes in the classroom or go on a shape hunt outside.
5. **Assessment tools**: Use assessment tools such as worksheets or quizzes to assess students' understanding of geometric shapes. You can also use performance tasks such as asking students to build a specific shape using blocks or draw a shape on paper.

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: Geometry is one of the oldest branches of mathematics and is concerned with the study of shapes, sizes, and positions of objects in space. Our world is filled with shapes and objects of different designs; therefore, a deep understanding of geometric thinking is important. Geometric thinking is an essential skill that involves visualizing, analyzing, and manipulating shapes, objects, and space. It is a critical skill that students need to develop to understand many mathematical concepts and to solve real-world problems. To develop geometrical thinking students should observe pictures, diagrams and models, participate in hands-on activities, provided with the opportunity to make real -life connections, collaborative learning and opportunities to engage in technological activities.
Strand (Topic): Geometrical Thinking
Essential Learning Outcome 3.1: Developing spatial sense - Composing, Decomposing and Transforming Shapes - Combining Shapes
Grade Level Expectations: Construct composite objects using cubes, cones, cylinders, spheres and identifying characteristics of these objects that make them easy to build with or not easy to build with.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **Construct composite objects using different shapes** • **Identify the different shapes used in the composite objects created.** • **State the characteristics of the shapes that make them easy or difficult to build with.** • **Discuss and describe the composite objects.**	**Hands-on Manipulatives**	**Concrete Manipulatives** Provide concrete manipulatives, such as shape blocks, pattern blocks, or playdough, for students to physically manipulate and create composite objects. This hands-on approach allows students to explore shapes through tactile and kinesthetic experiences, which can be especially beneficial for young learners.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **Compare and contrast different composite objects.**	Use hands-on manipulatives, such as shape blocks or pattern blocks, to allow students to physically create composite objects and explore different shapes.  **Multisensory Approaches** Incorporate multisensory approaches, such as using songs, chants, or rhymes that involve movement or gestures to teach and reinforce shape identification. This can engage students with different learning styles, including auditory and kinesthetic learners. **Authentic Assessment** Use authentic assessment strategies, such as performance tasks or projects, where students can create composite objects using different shapes. Introduce students to different 2D and 3D shapes and their properties (e.g. number of sides, corners, edges, faces, etc.).	 **Multisensory Instruction** Incorporate multisensory instruction by using songs, ***chants,*** or rhymes that involve movement or gestures to teach and reinforce shape identification. This can engage students with different learning styles, including auditory and kinesthetic learners, and make the learning experience more enjoyable and memorable. ***Chant*** ***Shape Hokey Pokey" chant:*** • For circle, put arms in a circle shape • For square, put arms in a square shape • For triangle, put arms in a triangle shape • For rectangle, put arms in a long and short shape *You put your circle in, you put your circle out, You put your circle in, and you shake it all about. You do the shape hokey pokey and you turn yourself around, That's what it's all about!*

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Performance task: Shape creature 1. *Have students draw and label different 2D and 3D shapes in their math journals or on a worksheet.* 2. *Explain that they will be using these shapes to create their own shape creatures. These creatures can be animals, monsters, aliens, or anything else they can imagine.* 3. *Provide students with a variety of materials such as construction paper, glue, scissors, and markers to create their creatures.* 4. *Have students cut out different shapes and arrange them on their paper to create their creatures. They can glue the shapes together to create a 3D effect or keep them flat to create a 2D creature.* 5. *Once their creatures are complete, have students label the shapes they used to create them. You can also have them count the number of sides, corners, edges, faces, etc. on each shape.* 6. *Display the students' shape creatures on a bulletin board or in the classroom for all to see..* **Hands-on Experiences** Provide hands-on experiences with actual manipulatives, such as shape blocks, pattern blocks, or other building materials, for students to explore and experiment with. Allow them to build with different shapes and observe	**Hands-on Activities** Provide hands-on activities where students can manipulate and explore different shapes using building materials such as blocks, clay, or playdough. Allow students to experiment with building and observe the characteristics that make certain shapes easy or difficult to work with. Hands-on activities can provide concrete experiences for students to understand the shapes' characteristics through tactile and kinesthetic learning.  **Guided Inquiry** Use guided inquiry approaches to encourage students to observe, question, and explore the characteristics of shapes that make them easy or difficult to build with. Ask open-ended questions such as "*What do you notice about the shape of this block?" or "Why do you think spheres are difficult to stack?"* This can promote critical thinking and problem-solving skills as students investigate and discover the characteristics of shapes on their own.

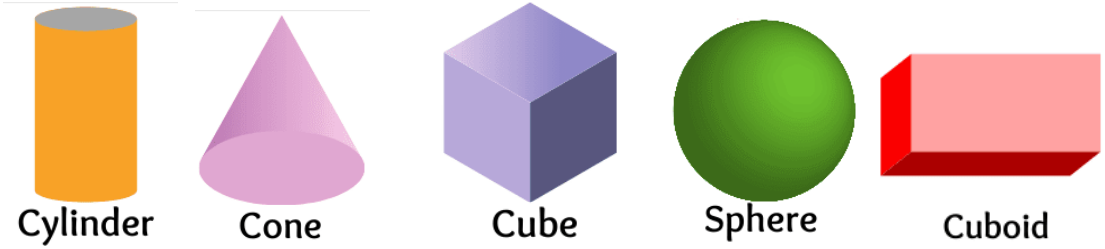
Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	and discuss the characteristics that make them easy or difficult to work with. Hands-on experiences can engage students in kinesthetic learning and promote their understanding of the shapes' buildability.  ***Why are the cylinders pinned at the top?*** **Verbal Descriptions** Use verbal descriptions or oral prompts to guide students in recognizing the characteristics of shapes that make them easy or difficult to build with. For example, ask students to describe the sides or edges of a cube that make it easy to stack, or the smooth and curved surface of a sphere that makes it difficult to stack. Verbal descriptions can support students with different learning styles, including auditory learners, in processing and understanding the information. **Multimodal Assessments** Utilize multimodal assessments that incorporate various modes of expression, such as written, oral, visual, or	**Simplified Language** Use simplified language and clear instructions to explain the characteristics of shapes in a way that is easy for grade 1 students to understand. Avoid using complex or technical language that may be confusing for young learners. Use simple and concrete terms to describe the characteristics of shapes and their buildability. **Guided Questions** Ask open-ended questions that prompt students to think critically about the characteristics of their composite objects. *For example, "What shape is your object?" "How did you connect the different parts?" "Why do you think your object is stable/unstable?" "What could you do to make it easier to build with?"* **Reflection and Metacognition** Encourage students to reflect on their own work and thought processes during the discussion. Ask them to explain their decision-making and problem-solving strategies, and reflect on what they learned from the activity. **Real-world Applications** Connect the learning of comparing and contrasting composite objects to real-world applications. For

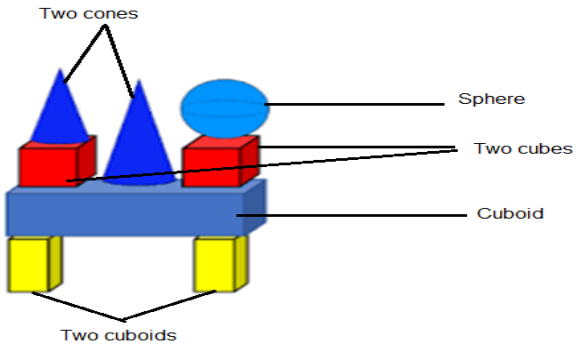
Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	hands-on, to allow students to demonstrate their understanding of the characteristics of shapes. *For example, students can draw or write about the characteristics of different shapes, verbally explain their observations, or physically build and manipulate shapes to demonstrate their understanding.* **Show and Tell** Provide opportunities for students to showcase and explain the composite objects they have created using building materials such as blocks, clay, or other manipulatives. Allow students to describe the characteristics of their objects, such as the shape, size, and arrangement of the components, and explain why they think their objects are easy or difficult to build with. **Think-Pair-Share** Use the Think-Pair-Share strategy, where students can first think independently about the characteristics that make their composite objects easy or difficult to build with, then discuss their ideas with a partner, and finally share their findings with the class. **Guided Questions** Ask students open-ended questions that prompt them to compare and contrast the characteristics of different	instance, discuss how different composite objects are used in everyday life, such as in construction, art, or play. This can help students see the relevance of their learning and understand the practical implications of the characteristics that make objects easy or difficult to build with. **Play-based Learning** Utilize play-based learning approaches to engage and motivate students. Allow them to engage in imaginative play with the composite objects, where they can experiment, create, and pretend. This can foster creativity, problem-solving skills, and critical thinking abilities while making the learning experience enjoyable and fun.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	composite objects. *For example, "What shapes do you see in each object?" "How are the objects similar or different in terms of stability?" "Which object do you think would be easier to build with and why?"* **Real-world Connections** Help students make connections between the characteristics of the composite objects and real-world objects or structures. *For example, discuss how stability and balance are important in building structures such as houses or furniture. This can help students see the relevance and practical applications of their learning.*	

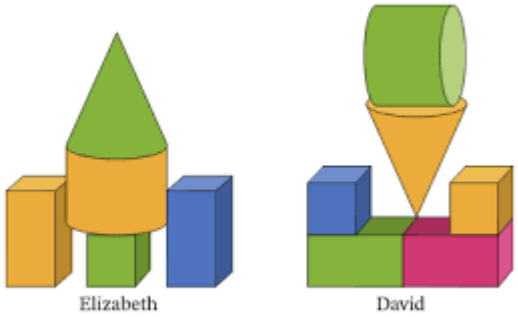
Useful Content Knowledge for the Teacher about the Outcome:

Identify the different shapes used in the composite objects they create.





Note: Composite shapes should also be placed in different orientations and to include non-examples. That 3D shapes they haven't encountered as yet.



Opportunities for Subject Integration:

Science

- Structures and Materials: Help students understand how composite solid shapes are used in structures and materials. Students can investigate how composite solid shapes are used in architecture, engineering, and everyday objects, such as buildings, bridges, and vehicles. They can explore the advantages and disadvantages of using composite solid shapes in different contexts, and design and build their own structures using composite solid shapes.
- Earth and Space Science: Explore how composite solid shapes are present in natural objects and phenomena. For example, students can study how mountains, rocks, crystals, and other natural formations are composed of composite solid shapes. They can also investigate how composite solid shapes are used in space exploration, such as spacecraft and planetary rovers.

Language Arts

- Reading: Incorporate literature that features composite solid shapes or related concepts, and engage students in discussions and activities related to the stories. For example, students can read books that depict characters interacting with composite solid shapes, or books that describe real-world scenarios where composite solid shapes are used. They can also engage in reading comprehension activities that involve identifying and analyzing composite solid shapes in text and images.
- Writing: Encourage students to express their understanding of composite solid shapes through writing. For example, they can write descriptive paragraphs or stories that use appropriate geometric vocabulary to describe composite solid shapes or explain how they are formed. They can also write persuasive or informative pieces that argue for or against the use of composite solid shapes in a specific context, or provide information about the properties and applications of composite solid shapes.

Social Studies

- Culture and History: Explore how composite solid shapes have been used in different cultures and historical periods. Students can investigate the use of composite solid shapes in traditional architecture, art, and artifacts from different regions and time periods, and analyze how they reflect the cultural and historical contexts. They can also examine how technological advancements have influenced the use of composite solid shapes in different societies over time.
- Economics: Study the economic aspects of composite solid shapes. Students can research how composite solid shapes are used in manufacturing, construction, and other industries, and analyze the economic implications of using composite solid shapes, such as costs, benefits, and environmental considerations. They can also investigate careers related to composite solid shapes, such as architects, engineers, and designers, and explore the skills and knowledge required for these careers.

Elements from Local Culture:

Traditional Architecture: Explore local traditional architecture and identify composite solid shapes used in buildings or structures. Students can observe and analyze how local buildings or structures are constructed using composite solid shapes, such as cubes, cylinders, or cones. They can identify different 3D shapes and their properties in the local architecture, and compare and contrast them with other composite solid shapes they have learned about.

Art and Crafts: Introduce local art and crafts that incorporate composite solid shapes. Students can explore local artwork or crafts that use composite solid shapes as design elements, such as sculptures, baskets, or pottery. They can observe the shapes, patterns, and arrangements in these art forms, and identify the composite solid shapes used. Students can also create their own art or crafts using composite solid shapes, inspired by local cultural elements.

Traditional Tools and Objects: Explore local tools, objects, or artifacts that are made of composite solid shapes. Students can investigate how traditional tools or objects in their local culture are constructed using composite solid shapes, such as bowls, drums, or masks. They can identify the shapes and their properties in these objects, and understand how the composite solid shapes are used for different purposes.

Local Celebrations or Festivals: Explore local celebrations or festivals that involve composite solid shapes. Students can learn about local celebrations or festivals that feature composite solid shapes as decorations, costumes, or props, and understand the significance and symbolism of these shapes in the local culture. They can also create their own composite solid shape decorations or props for a class celebration or festival, inspired by local cultural elements.

Traditional Stories or Legends: Incorporate local traditional stories or legends that involve composite solid shapes. Students can listen to or read local stories or legends that feature composite solid shapes as key elements, and discuss the shapes and their significance in the stories. They can also retell or recreate the stories using composite solid shapes as visual aids, or create their own stories that incorporate composite solid shapes and local cultural elements.

Resources for a learner who is struggling:

1. **Visual aids:** Provide visual aids, such as posters, charts, or flashcards, that display different shapes and their names. These visual aids can help learners visually identify and associate shapes with their names, making it easier for them to recognize shapes in the composite objects they create.
2. **Manipulatives:** Use manipulatives, such as building blocks, interlocking toys, or playdough, that allow learners to physically handle and manipulate shapes. Hands-on experiences with tangible objects can help learners better understand the characteristics of shapes and how they are used in composite objects.
3. **Interactive online resources:** There are many interactive online resources, such as educational websites, apps, or games, that offer engaging activities for learners to practice identifying shapes. These resources often provide visual cues, prompts, and feedback to support learners in their shape identification skills.
4. **Worksheets and activities:** Use worksheets and activities specifically designed for identifying shapes in composite objects. These can include exercises where learners need to identify and circle or label the shapes used in composite objects, or cut-and-paste activities where learners need to match shapes with the corresponding composite objects.
5. **Small group or one-on-one instruction:** Provide small group or one-on-one instruction to learners who are struggling with identifying shapes in composite objects. This allows for personalized attention and targeted instruction to address their specific needs and challenges.

6. **Multisensory approaches:** Incorporate multisensory approaches, such as incorporating auditory, visual, and kinesthetic elements into the learning process. For example, learners can listen to shape names, see visual representations of shapes, and physically manipulate shapes using hands-on materials.
7. **Differentiated instruction:** Differentiate instruction based on the learner's individual needs, abilities, and learning style. Provide varied levels of difficulty or scaffolding, and offer opportunities for repeated practice and reinforcement.
8. **Home-based activities:** Encourage learners to practice identifying shapes in composite objects at home with the support of family members or caregivers. This can include identifying shapes in household objects, creating composite objects using everyday items, or playing shape recognition games.

Resources for a learner who needs challenge:

Online Interactive Games: There are many websites that offer interactive games to help young learners understand composite solid shapes. Some popular ones include:

- PBS Kids (pbskids.org): PBS Kids has various games that focus on shapes, including composite solid shapes, such as "Shape Quest" and "Martha Speaks - Dog Party."
- ABCya! (abcya.com): ABCya! offers games that focus on geometry and shapes, including "Shape Invasion" and "Geoboard."
- Funbrain Jr. (funbrainjr.com): Funbrain Jr. has games that introduce basic geometry concepts, including composite solid shapes, such as "Shape Puzzler" and "Geometry Matching."

Printable Worksheets: There are many websites that offer printable worksheets for young learners to practice working with composite solid shapes. Some popular ones include:

- Education.com (education.com): Education.com has a variety of worksheets related to geometry and shapes, including composite solid shapes, such as "Solid Shapes: Identifying 3D Shapes" and "Building 3D Shapes."
- TeachersPayTeachers (teacherspayteachers.com): TeachersPayTeachers is a platform where teachers can share and sell educational resources, including worksheets related to composite solid shapes. You can find a wide range of worksheets, from simple to more complex, depending on the needs of your grade 1 learner.

Books: There are also children's books available that focus on geometry and shapes, including composite solid shapes. Some popular ones include:

- "3-D Shapes" by David A. Adler: This book introduces young learners to various 3D shapes, including composite solid shapes, in a simple and engaging way.
- "Captain Invincible and the Space Shapes" by Stuart J. Murphy: This is a fun and educational picture book that follows Captain Invincible as he explores space and encounters various composite solid shapes.

Teacher-created Resources: Many teachers create their own resources, such as lesson plans, activities, and worksheets, to help their students learn about composite solid shapes. You may find such resources on educational websites, teacher blogs, or online communities for educators.

Strategies that Support the Curriculum and Assessment Framework

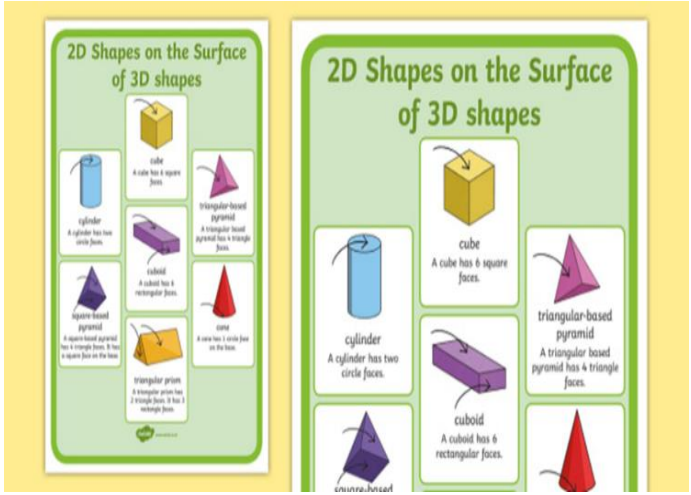
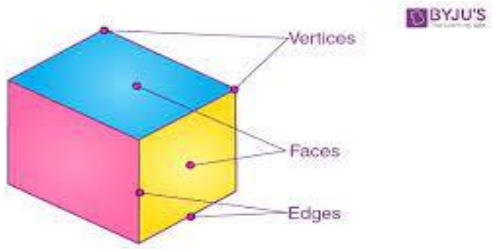
Elements that are integrated across subjects:

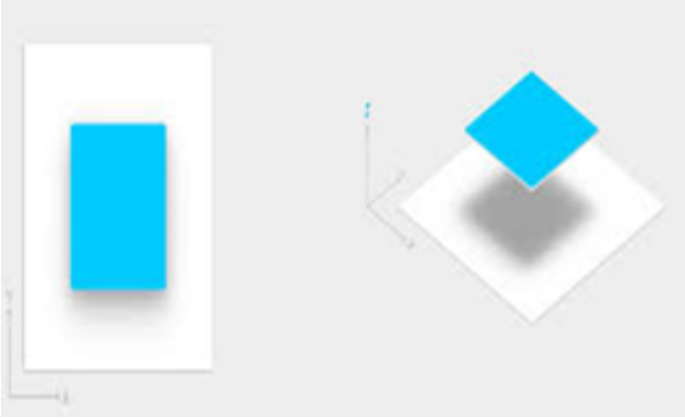
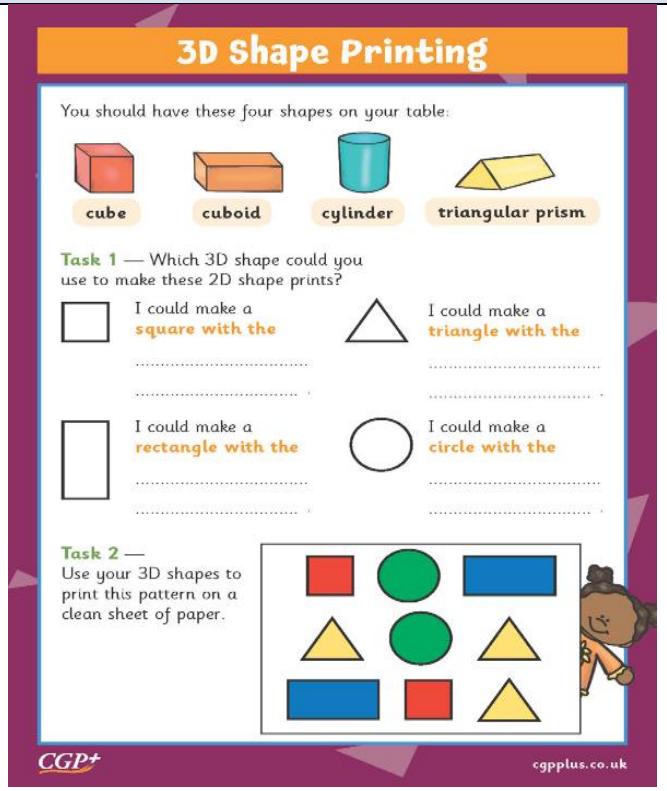
Elements from Local Culture, Technology, TVET, Environment that are integrated:

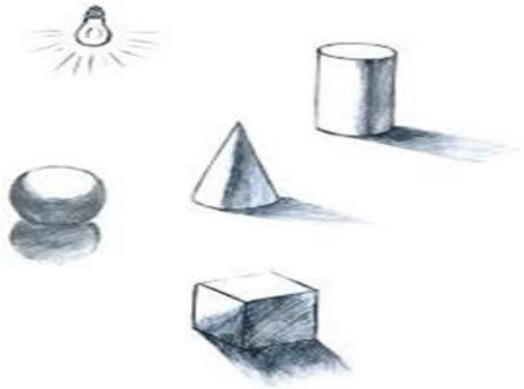
Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

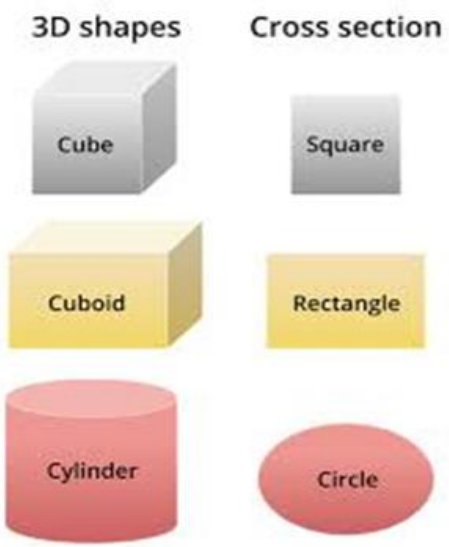
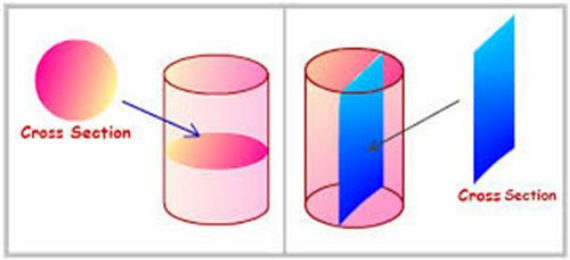
Introduction to the Subject: Geometry is one of the oldest branches of mathematics and is concerned with the study of shapes, sizes, and positions of objects in space. Our world is filled with shapes and objects of different designs; therefore, a deep understanding of geometric thinking is important. Geometric thinking is an essential skill that involves visualizing, analyzing, and manipulating shapes, objects, and space. It is a critical skill that students need to develop to understand many mathematical concepts and to solve real-world problems. To develop geometrical thinking students should observe pictures, diagrams and models, participate in hands-on activities, provided with the opportunity to make real -life connections, collaborative learning and opportunities to engage in technological activities.
Strand (Topic): Geometrical Thinking
Essential Learning Outcome 3.2: Composing, Decomposing and Transforming Shapes – Deconstructing Shapes
Grade Level Expectations: Deconstruct shapes identifying 2D shapes that can be found in cubes, cones, cylinders, spheres through making footprints, making shadows, or slicing

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **Identify and name at least three different 2D shapes (e.g., circles, squares, rectangles, triangles) that can be found in cubes, cones, cylinders, and spheres.** • **Create and name 2D shapes by using physical objects (such as cubes, cones, cylinders, and spheres) to create "footprints" or "shadows" on paper.**	**Visual Identification:** Provide visual aids such as pictures or diagrams of cubes, cones, cylinders, and spheres with 2D shapes highlighted within them. Ask students to identify and name the 2D shapes they see, using appropriate vocabulary like circles, squares, rectangles, and triangles.	**Visual Aids:**

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **Describe the resulting cross-section of slicing a cube, cone, cylinder, or sphere is sliced, the resulting cross-sections can be different 2D shapes, and be able to identify and name these shapes.** • **Use appropriate vocabulary (e.g., edges, vertices, sides, circles, triangles) to describe the features of cubes, cones, cylinders, and spheres, and explain how these features can be used to identify the 2D shapes within them.** • **Apply knowledge of 2D shapes to real-world objects by identifying and naming the 2D shapes that can be found in everyday objects that resemble cubes, cones, cylinders, and spheres, such as a soccer ball (sphere) or a building block (cube).**	 **Verbal Descriptions:** Use verbal descriptions and guided discussions to help students describe the features of cubes, cones, cylinders, and spheres using appropriate vocabulary like edges, vertices, sides, circles, and triangles. Encourage students to explain how these features can be used to identify the 2D shapes within them. **Hands-on Manipulation:** Provide students with actual cubes, cones, cylinders, and spheres that they can hold, manipulate, and use to create	Use visual aids, such as posters or charts, that display images or diagrams of cubes, cones, cylinders, and spheres, along with the 2D shapes that can be found within them. Label the shapes using appropriate vocabulary, such as edges, vertices, sides, circles, and triangles, to help students associate the shapes with the objects.  **Guided Questions:** Ask guided questions that prompt students to think critically about the features of cubes, cones, cylinders, and spheres, and how these features relate to the 2D shapes within them. For example, you can ask questions like "*How many sides does a cube have?"* or *"What shape do you see on the top of a cylinder?"*

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	footprints or shadows on paper. This hands-on approach allows students to actively engage with the  objects, feel their shapes, and explore how they create different 2D shapes when pressed against paper. **Verbal Prompts:** Use verbal prompts to guide students in identifying and naming the 2D shapes created by the 3D objects. For example, you can ask questions like *"What shape do you see when you press the cube on the paper?"*, *"What shape is formed when you roll the cylinder?"*, or *"What do you notice about the shape created by the cone?"*. Verbal prompts can help students articulate their observations and make connections between the objects and the shapes formed.	 **Visual Aids:**

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Hands-on Activities: Provide opportunities for students to physically slice or cut cubes, cones, cylinders, and spheres using safe and appropriate materials. Allow them to observe and identify the resulting cross-sections, and use appropriate vocabulary (e.g., circles, triangles, rectangles) to name these shapes.  **Visual Representations**: Use visual representations, such as diagrams or pictures, to show the process of slicing a cube, cone, cylinder, or sphere, and the resulting 2D shapes. Ask students to label and name these shapes based on the visual representations provided.	Use visual aids such as pictures, diagrams, or illustrations to demonstrate how cubes, cones, cylinders, and spheres can create 2D shapes when projected onto paper. Show examples of "footprints" or "shadows" created by these objects and help students identify and name the resulting shapes.  **Guided Exploration:** Guide students through a structured exploration activity where they can experiment with the objects and create different "footprints" or "shadows" on paper. Provide prompts or cues to help them make connections between the objects and the resulting 2D shape. **Hands-on Exploration:**

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 **Vocabulary Checks:** Conduct vocabulary checks during classroom discussions or one-on-one interactions with students to assess their ability to use appropriate vocabulary related to the features of cubes, cones, cylinders, and spheres. Ask students to explain the meaning of key terms such as edges, vertices, sides, circles, and triangles, and provide examples of these features in the context of these 3D shapes.	Provide students with actual cubes, cones, cylinders, and spheres to explore and manipulate. Encourage them to slice these objects using safe tools or by using their hands and observe the resulting cross-sections. Help them identify and name the 2D shapes formed, such as circles, rectangles, triangles, etc. This hands-on approach can provide a tangible and meaningful experience for students to understand the concept of cross-sections.    **Discussion and Language Development:**

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Cooperative Learning Activities: Engage students in cooperative learning activities where they work in pairs or small groups to discuss and describe the features of cubes, cones, cylinders, and spheres. Assess their ability to use appropriate vocabulary in their discussions and explanations and provide feedback accordingly. **Real-world object identification:**	Engage students in discussions about the concept of cross-sections and the different 2D shapes that can be formed. Use appropriate vocabulary, such as edges, vertices, sides, circles, triangles, etc., and model their use during discussions. *Encourage students to ask questions and share their observations and interpretations. Provide opportunities for students to practice using the vocabulary in context through discussions, group activities, or role-play.* **Inquiry-based Learning:** Encourage students to explore and investigate the concept of cross-sections on their own or in small groups. Provide them with materials, such as playdough or clay, to create their own 3D objects and slice them to observe the resulting cross-sections. Allow them to experiment, make observations, and draw conclusions about the different 2D shapes formed. This inquiry-based approach can foster curiosity, critical thinking, and problem-solving skills.  **Language support:**

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Provide a variety of real-world objects that resemble cubes, cones, cylinders, and spheres, such as toys, household items, or images. Ask students to identify and name the 2D shapes they can find in these objects. For example, a soccer ball can be used to identify a circle (for the patches) and a sphere (for the overall shape).  **Picture-based assessments:** Use pictures or diagrams of everyday objects that resemble cubes, cones, cylinders, and spheres, and ask students to identify and name the 2D shapes within them. This can be done through worksheets or digital platforms where students can drag and drop labels to match the shapes they see in the pictures.	Use simplified language and provide clear explanations of the vocabulary terms such as edges, vertices, sides, circles, and triangles. Use concrete examples and relate them to familiar objects or experiences that students can easily understand. **Multisensory approaches:** Incorporate multisensory approaches such as tactile, auditory, and visual cues to accommodate different learning styles. For example, use textured shapes, play verbal games, or use interactive online resources that provide visual and auditory cues to help students connect the features of 3D shapes with the 2D shapes within them. https://study.com/academy/lesson/identifying-2d-shapes-in-3d-figures-lesson-for-kids.html **Inclusive language:** Use inclusive language that promotes diversity and inclusivity in the classroom. Avoid gender-specific terms and ensure that all students feel valued and included in the learning process, regardless of their backgrounds or abilities. **Real-World Object Exploration:**

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		Provide opportunities for students to explore real-world objects that resemble cubes, cones, cylinders, and spheres, such as soccer balls, building blocks, or toy cars. Encourage them to use their senses to examine the objects, and ask open-ended questions to prompt their observations and discussions about the 2D shapes they can identify on these objects.  **Personal Connections:** Help students make personal connections between the 2D shapes they are learning about and their own lives. For example, ask them to identify and name the 2D shapes in objects they use every day, such as their lunch

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		box (cube), a pencil (cylinder), or a toy car (cone). This can make the learning more relevant and meaningful to them and help them apply the knowledge to their own experiences. ***This scenario can be used to make real world connections.*** *"Shawna is at home with her family, but her parents are busy cooking dinner in the kitchen. She wants to practice identifying 2D shapes in 3D objects and starts looking around the house for items she can use.* *There is a ball on the floor and recognize it as a sphere, a cereal box on the counter and notice that it has rectangles for sides. Also, she sees a can of soup in the cupboard and realizes it is a cylinder because it has circles on the top and bottom. Next, she goes into the living room and sees a toy block set, picks up a cube and observes that all its sides are squares. Shawna also sees a cone-shaped lampshade on a table and notices that it has a circular base. Finally, she goes into the bedroom and sees a basketball hoop hanging on the wall. The backboard is a rectangle, and the rim is a circle. She is proud of herself for finding all these 3D objects in her house and identifying the 2D shapes that make them up".*

Useful Content Knowledge for the Teacher about the Outcome:
Deconstruct shapes identifying 2D shapes that can be found in cubes, cones, cylinders, spheres through making footprints, making shadows, or slicing

Basic 2D shapes:

Students should be familiar with basic 2D shapes such as circles, squares, rectangles, and triangles. They should know their names, characteristics (e.g., number of sides, angles), and be able to recognize them in different orientations.

Understanding 2D shapes is an important foundation for geometry and can help students develop skills in problem-solving and spatial reasoning.

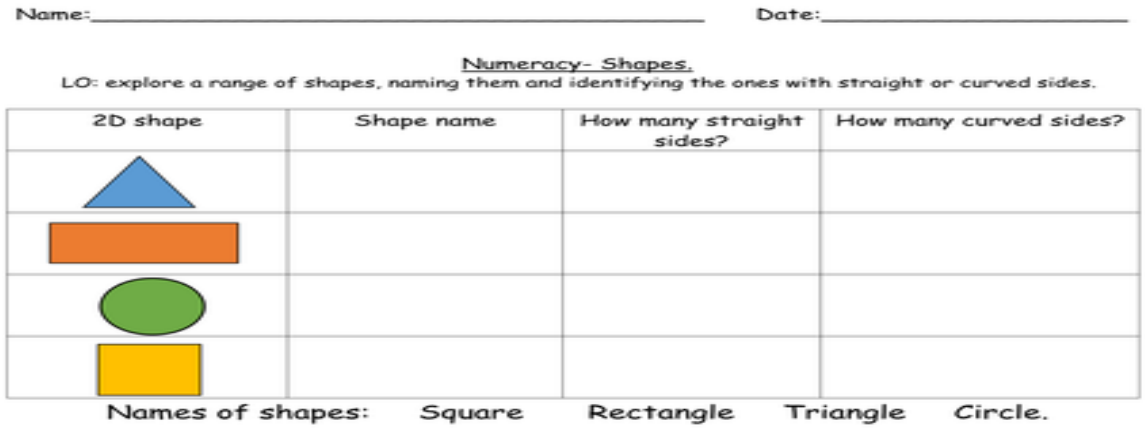
A 2D shape is a flat, two-dimensional figure that has only length and width.

Examples of 2D shapes include circles, squares, triangles, rectangles, and hexagons.

These shapes can be identified by their specific attributes, such as:

- the number of sides and corners they have
- or whether they have straight or curved sides.

https://www.youtube.com/watch?v=apAmQCzjmtE



Name:_____ Date:_____

Numeracy- Shapes.

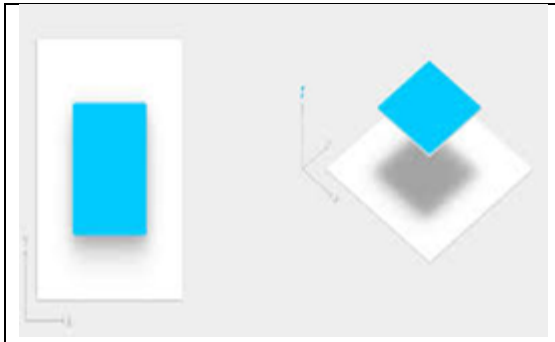
LO: explore a range of shapes, naming them and identifying the ones with straight or curved sides.

2D shape	Shape name	How many straight sides?	How many curved sides?

Names of shapes: Square Rectangle Triangle Circle.

Spatial awareness: Students should develop spatial awareness skills to understand the relationships between 2D shapes and 3D objects. They should learn about concepts such as edges, vertices, and sides of 3D objects like cubes, cones, cylinders, and spheres, and how they relate to the 2D shapes that can be found within them.

Observation skills: Students should develop observation skills to identify and recognize 2D shapes in real-world objects that resemble cubes, cones, cylinders, and spheres. This can be done through activities such as making footprints or shadows on paper, or slicing objects to reveal the cross-sections and identify the 2D shapes present.



Hands-on activities: Students benefit from hands-on activities that allow them to manipulate and explore real-world objects to identify and name 2D shapes within them. Activities such as using physical objects to create footprints or shadows on paper, or slicing objects to reveal cross-sections, can be engaging and effective in helping them understand the concept of 2D shapes within 3D objects.

Visual aids: Students can benefit from visual aids such as diagrams, illustrations, or models that represent the 3D objects and the 2D shapes within them. Visual aids can help them visualize and better understand the relationships between the 3D objects and the 2D shapes, and make connections between real-world objects and geometric concepts.

Differentiated instruction: Inclusive learning strategies should also consider differentiating instruction to meet the diverse needs of grade 1 students. This can include providing additional support, adaptations, or accommodations for students with different learning styles, abilities, or needs. For example, using tactile or multisensory approaches for students with sensory impairments, providing visual supports for students with visual impairments, or using simplified language or visual cues for students with language or cognitive challenges.

Inclusive Resources and Materials from Regional Specialists (*texts, family &community knowledge and resources, contextually relevant professional web resources*)
https://portal.educoas.org/en/courses/oas-profuturo-online-courses-innovation-and-mathematics-caribbean-teachers

Additional Resources and Materials
https://study.com/academy/lesson/identifying-2d-shapes-in-3d-figures-lesson-for-kids.html
https://www.youtube.com/watch?v=apAmQCzjmtE

Useful vocabulary

Cube: a solid shape with six square faces of equal size
Cone: a solid shape with a circular base and a curved surface that narrows to a point
Cylinder: a solid shape with circular ends and straight sides
Sphere: a solid shape that is perfectly round like a ball
Face: a flat surface on a 3D shape
Edge: the line where two faces of a 3D shape meet
Vertex: the point where three or more edges of a 3D shape meet
Shadow: a dark shape that is made on a surface when something blocks light
Footprint: the outline of a 3D shape left behind when it touches a surface
Slice: to cut through a 3D shape to create a flat 2D surface

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

By integrating these different subjects into the lesson of deconstructing shapes and identifying 2D shapes that can be found in cubes, cones, cylinders, and spheres, students can deepen their understanding of the concepts and build connections between different areas of learning.

Science: Students can learn about the characteristics of 3D shapes and their properties such as volume and surface area. They can understand the difference between 2D and 3D shapes and explore how shadows are formed when light interacts with 3D objects. Students can also learn about the different materials that can be used to create 3D shapes.

Art: Students can create footprints, make shadows, or slice 3D objects to make 2D shapes. They can explore the use of different materials to create 3D shapes such as clay, paper mache, or play dough. Students can also create 2D shapes using different art techniques such as drawing, painting, or collage.

Literacy: Students can read books about shapes and 3D objects. They can also write and describe the shapes they see in 3D objects using descriptive words and sentences.

Social Studies and HFLE

Community Helpers: Students can explore how community helpers use shapes in their jobs. For example, doctors use cylinders and cones in medical equipment such as syringes and stethoscopes.
***Healthy Eating*:** Students can explore different shapes of healthy foods such as circular fruits like oranges and apples, or cylindrical vegetables like carrots and cucumbers.
Exercise and Play: Students can explore the different shapes of equipment used for exercise and play such as balls, cones, and cylinders. They can also investigate how playing with different shapes can help develop gross motor skills and coordination.
Home Safety: Students can explore how different shapes can be used for safety at home. For example, they can identify the shapes of safety equipment such as smoke detectors and fire extinguishers.
Community Spaces: Students can explore how different shapes are used in community spaces such as parks, playgrounds, and buildings. They can also investigate how the shapes of these spaces affect how people use them and interact with each other.
Technology:
Digital games and activities: Use digital games and activities such as online shape games, virtual shape builders, and shape sorting activities to help students identify and understand 2D shapes in 3D objects.
Augmented reality (AR) and virtual reality (VR): Use AR and VR technologies to create immersive experiences for students to explore 3D shapes and their properties. For example, students can use AR apps to scan a 3D object and explore its shape and properties in a virtual environment.
3D modeling software: Use 3D modeling software such as Tinkercad or SketchUp to help students create and manipulate 3D shapes. Students can design their own 3D shapes and explore how the 2D shapes are interconnected.
Interactive whiteboards and tablets: Use interactive whiteboards and tablets to display and manipulate 2D and 3D shapes. Students can use digital pens or fingers to draw and identify shapes or drag and drop shapes into different categories.
By integrating technology into the lesson, students can develop digital literacy skills while deepening their understanding of 2D and 3D shapes.

Elements from Local Culture:
Here are some real environment examples for deconstructing shapes and identifying 2D shapes that can be found in cubes, cones, cylinders, and spheres using making footprints, making shadows, or slicing:
Cubes: Students can explore cubes such as Maggi cubes, dice, ice cubes. They can make footprints of the cubes in playdough or clay to identify the shape of the cube. Students can also create shadows of the cubes in sunlight to see the 2D shape of the shadow.
Cones: Students can explore cone shaped hats such as straw hats. They can make footprints of the hats in paper or cardstock to identify the shape of the cone. Also, they can slice a cone-shaped fruit such as a pineapple to see the 2D shape of the slice.
Cylinders: Students can explore the cylinder shape of traditional drums such as steel pans. They can make footprints of the drums in sand or salt dough to identify the shape of the cylinder. Students can create shadows of the drums in sunlight to see the 2D shape of the shadow.

Spheres: Students can explore the sphere shape of traditional fruits such as sapodilla or breadfruit. They can make footprints of the fruit in clay or playdough to identify the shape of the sphere. Alternatively, students can slice a sphere-shaped fruit such as a passionfruit to see the 2D shape of the slice. By using real environment examples, students can connect their learning to their local culture and environment, which can enhance their engagement and understanding of the concepts.

Resources for a learner who is struggling:

There are several resources available for grade 1 students who may be struggling with deconstructing shapes and identifying 2D shapes that can be found in cubes, cones, cylinders, and spheres. Here are some suggestions:

Online shape games: There are many online games and activities available that can help students practice their shape recognition skills. Some examples include ABCya's Shape Match, Education.com's Shape Sorter, and Funbrain's Shape Invasion.

Manipulatives: Using manipulatives such as blocks, pattern blocks, or tangrams can help students visualize and manipulate shapes to better understand their properties. Students can create different 2D and 3D shapes using these manipulatives and practice identifying them.

Worksheets: There are many free printable worksheets available online that focus on shape recognition and identification. These worksheets can help students practice identifying shapes and counting sides, vertices, and edges.

Interactive whiteboards: Interactive whiteboards can be a great tool for visual learners. Teachers can use the whiteboard to display and manipulate shapes, and students can use digital pens or fingers to draw and identify shapes.

One-on-one instruction: For students who are struggling with the concept, one-on-one instruction with a teacher or tutor may be beneficial. This allows the student to receive personalized instruction and practice.

It is important to note that every student learns differently, so it is important to identify the student's learning style and tailor instruction to meet their needs. Patience, repetition, and positive reinforcement can also go a long way in helping struggling students.

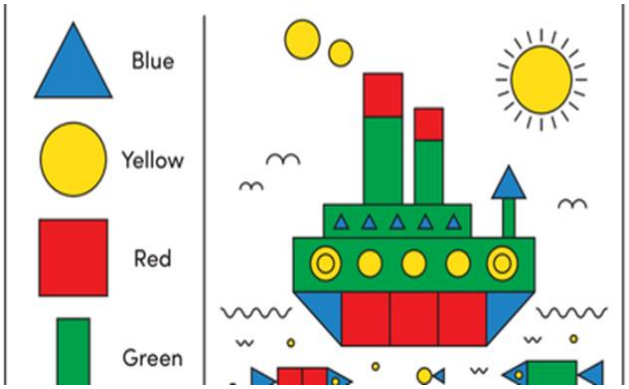
Resources for a learner who needs challenge:

To challenge students in deconstructing shapes and identifying 2D shapes that can be found in cubes, cones, cylinders, and spheres, here are some resources that can be helpful:

Geometric construction sets: Construction sets such as Magformers, Tegu, or Geomag can provide a challenging hands-on activity for students to create and explore different 2D and 3D shapes.


Digital shape builders: Online shape builders such as GeoGebra or Shapespark allow students to create and manipulate 2D and 3D shapes using digital tools. These tools can provide a more complex and interactive experience for students.

Real-life problem-solving activities: Real-life problem-solving activities can challenge students to apply their shape recognition skills in practical scenarios. For example, students can design a 3D structure using 2D shapes or create a map of their classroom using different shapes.



Critical thinking puzzles: Puzzles such as tangrams, Sudoku, or logic puzzles can challenge students to think critically and apply their shape recognition skills in a different way.

Enrichment activities: Enrichment activities such as creating art with geometric shapes or designing a 3D structure with toothpicks and marshmallows can provide a fun and challenging activity for students to apply their skills.

It is important to provide students with challenging activities that match their abilities and interests to keep them engaged and motivated. Providing opportunities for student-led exploration and creativity can also encourage them to think outside the box and develop problem-solving skills.

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)

Introduction to the Subject: Geometry is one of the oldest branches of mathematics and is concerned with the study of shapes, sizes, and positions of objects in space. Our world is filled with shapes and objects of different designs; therefore, a deep understanding of geometric thinking is important. Geometric thinking is an essential skill that involves visualizing, analyzing, and manipulating shapes, objects, and space. It is a critical skill that students need to develop to understand many mathematical concepts and to solve real-world problems. To develop geometrical thinking students should observe pictures, diagrams and models, participate in hands-on activities, provided with the opportunity to make real -life connections, collaborative learning and opportunities to engage in technological activities.
Strand (Topic): Geometrical Thinking
Essential Learning Outcome 3.3: Composing, Decomposing and Transforming Shapes – Transforming Shapes
Grade Level Expectations: Transform 3D objects using concrete materials (playdough, sand, clay, etc.)

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **Identify and name common 3D shapes, such as cubes, spheres, cones, and cylinders.** • **Use basic spatial concepts, such as up, down, in front of, behind, and beside correctly.** • **Use concrete materials, such as playdough, sand, or clay, to create 3D shapes and objects.** • **Transform 3D objects by molding, shaping,**	**Manipulatives:** Provide students with manipulatives such as blocks or toys to demonstrate the spatial concepts. ***For example, ask students to place a toy behind a block or place a block beside another block.*** **Model the concepts:** **Play games:** Play games such as *Simon Says* or *Red Light, Green Light* that involve movement and spatial concepts. For example, give commands such as *"Jump up and down"* or "*Walk behind the desk."* **Draw or colour:**	**Hands-on activities:** Provide hands-on activities that allow students to manipulate objects and practice spatial concepts. For example, students can build towers with blocks or move objects around a room to practice the concepts of in front of and behind. **Songs and rhymes:** Use songs and rhymes to help students remember the spatial concepts. For example, sing *"The Hokey Pokey"* to practice up and down, or recite a rhyme about a bunny hopping in front of and behind objects.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
stretching, and flattening the materials. • **Identify similarities and differences between transformed and original objects.** • **Use mathematical language to describe the transformations, such as "flattened," "stretched," or "twisted."** • **Explore different ways to transform objects, such as rotating, flipping, or sliding.** • **Use trial and error to solve problems related to transforming objects.** • **Work collaboratively with peers to create and transform 3D objects.** • **Reflect on learning and identify areas for improvement in their ability to transform 3D objects.**	Ask students to draw or color pictures that show the spatial concepts. For example, ask students to draw a picture of a tree in front of a house or color a picture of a ball beside a box.  **Observe and document:** Observe students as they work with the materials and document their process and the transformations they make. You can take notes, photos, or videos to capture their progress. **Rubrics:** Develop a rubric that outlines specific criteria for the transformations you are looking for, such as the use of different techniques or the creation of a specific shape. **<u>Sample Rubric for Transformations:</u>** **<u>Criteria:</u>**	**Movement and games:** Incorporate movement and games into learning to engage students and reinforce spatial concepts. For example, students can play *"Follow the Leader"* or *"Red Light, Green Light"* to practice moving in different directions and using spatial language. **Encourage exploration:** Encourage students to explore the materials and experiment with different techniques to see what works and what doesn't when transforming shapes.  **Prompts:** Use prompts to guide students in their exploration and help them focus on specific concepts. For example, you can ask students to

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	1. Use of different techniques: • *Demonstrates the ability to use at least two different techniques to create a transformation (e.g. flipping, sliding, rotating).* • *Uses appropriate terminology to describe the transformations (e.g. "flip", "slide", "turn").* ***2. Creation of specific shape:*** • *Successfully creates a specified shape through the use of transformations (e.g. creates a square by flipping a rectangle).* • *Uses appropriate terminology to describe the shape (e.g. "square", "rectangle").* ***3. Accuracy:*** • *Accurately completes the transformation with minimal errors.* • *Demonstrates attention to detail in the transformation process.* ***4. Creativity:*** • *Shows creativity in the transformation process (e.g. creates a unique design or pattern through the use of transformations).* • *Demonstrates the ability to think outside of the box.* ***5. Neatness:*** • *The final product is neat and well-presented.* • *Demonstrates care in the creation of the transformation.*	create a specific shape or to use a certain technique to make a texture. **Encourage descriptive language:** Encourage students to use descriptive language to talk about the original and transformed 3D objects. This can include using words like *"same," "different," "bigger," "smaller," "curvy," "straight,"* etc. **Examples:** Provide students with concrete examples of similarities and differences between the original and transformed 3D objects. *For example, you can show them a block and a cylinder and ask them to identify the similarities and differences.* **Concrete examples:** Use concrete examples of transformations and model how to use mathematical language to describe them. *For example, you can show students how to describe the transformation of a flat piece of paper into a paper airplane using words like "folded" and "twisted."* **Exploration:** Encourage students to explore different transformations and describe them using mathematical language. This can be done

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	<u>Scoring:</u> 4 - ***Exceeds expectations:*** • *Demonstrates mastery of all criteria and goes above and beyond in creativity and accuracy.* *3 - **Meets expectations:*** • *Demonstrates a solid understanding of all criteria and completes the transformation with accuracy and creativity.* *2 - **Needs improvement:*** • *Demonstrates some understanding of the criteria, but lacks accuracy or creativity in the transformation process.* *1 - **Not meeting expectations:*** • *Demonstrates limited understanding of the criteria and struggles with accuracy and creativity in the transformation process.* **Ask open-ended questions:** Ask students open-ended questions about the similarities and differences between the original and transformed objects. For example, *"What is the same between these two objects?"* or *"What is different about the two objects?"* **Graphic organizers:** Use graphic organizers such as Venn diagrams or T-charts to help students compare and contrast the original and transformed objects. This can help students organize their thoughts and make connections between the two objects. **Provide opportunities for oral communication:**	through open-ended activities that allow students to be creative and use their imagination. **Games:** Use interactive games such as *matching games or "spot the difference"* games to help students practice using mathematical language to describe transformations. Encourage students to work in pairs or small groups to explore and describe transformations using mathematical language. **Hands-On Activities:** Provide students with manipulatives such as blocks, shapes, and puzzles that they can physically manipulate to explore different transformations. This will help them understand concepts like rotation, flipping, and sliding. **Multi-Sensory Learning:** Incorporate different senses into the learning experience. *For example, allow students to touch and feel different objects as they explore transformations, or use music and movement to reinforce concepts.*

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Allow students to describe their transformations using mathematical language through oral communication. You can use *a "math talk" approach* where students share their thought process with the class. Ask students open-ended questions such as *"What did you do to transform the object?" or "How did you change the shape of the object?"* to prompt them to use mathematical language to describe their transformations. **Peer assessment:** Encourage students to assess each other's work and use mathematical language to describe the transformations. This can help promote collaboration and communication skills. **Hands-on exploration:** Provide students with different materials and objects to manipulate and transform using different methods such as rotating, flipping, or sliding. Observe their processes and ask questions to prompt their thinking and describe their transformations. Ask open-ended questions such as *"What did you do to transform the object?"* or "*Can you show me how you rotated the object?"* to encourage students to explain their thinking and use specific vocabulary. **Peer assessment:** Encourage students to assess each other's work and describe the transformations they observe. This can help promote collaboration and communication skills.	

Useful Content Knowledge for the Teacher about the Outcome:

Composing, Decomposing and Transforming Shapes - Transforming Shapes

Understanding 3D Shapes: Start by introducing students to the concept of 3D shapes. Show them examples of different 3D objects such as cubes, cones, cylinders, spheres, etc. Help them identify the different parts of the shapes such as faces, edges, and vertices.

Composing Shapes: Next, introduce the concept of composing shapes. Demonstrate how to create new shapes by combining two or more 3D shapes. Encourage students to experiment with different combinations and record their findings.

Decomposing Shapes: Once students are familiar with composing shapes, move on to decomposing shapes. This involves breaking down a 3D shape into smaller parts. Demonstrate how to do this with concrete materials such as blocks or play dough.

Transforming Shapes: Finally, introduce the concept of transforming shapes. This involves changing the position, size, or shape of a 3D object. Show students how to transform objects by rotating, flipping, or sliding them. Encourage them to use concrete materials to experiment with different transformations.

Hands-On Activities: To reinforce these concepts, provide hands-on activities for students to explore. For example, have them build 3D shapes with blocks or play dough, then transform them by rotating, flipping, or sliding them. You could also create a scavenger hunt where students search for different 3D shapes in the classroom or school, then compose and decompose them using concrete materials.

Inclusive Resources and Materials from Regional Specialists (*texts, family &community knowledge and resources, contextually relevant professional web resources*)

https://portal.educoas.org/en/courses/oas-profuturo-online-courses-innovation-and-mathematics-caribbean-teachers

Additional Resources and Materials

https://www.youtube.com/watch?v=1xIT_D8sLpk

Useful vocabulary

Shape: An object that has two dimensions, such as length and width.
Compose: To create a larger shape by combining smaller shapes.
Decompose: To break down a larger shape into smaller shapes.
Transform: To change the size, position, or orientation of a shape.
Flip: To turn a shape over.
Slide: To move a shape in a straight line without changing its orientation.
Turn: To rotate a shape around a point.

Pattern: A repeating sequence of shapes or colors.
Symmetry: A shape that can be divided into two equal parts that mirror each other.
Attribute: A characteristic of a shape, such as size, color, or shape itself.

Opportunities for Subject Integration: *(How the inclusive learning strategies might be adapted and/or applied to include other subjects in the curriculum)*
Science: In science, students can learn about the properties of different materials used to make 3D objects. Discuss the difference between materials such as plastic, wood, and metal. Students can also explore how forces such as pushing, pulling, and twisting can transform 3D objects.
Art: Art is a great subject to integrate into this lesson as it involves creativity and imagination. Have students create their own 3D objects using materials such as clay, paper, or cardboard. They can then transform their objects by painting, drawing, or adding different materials.
Language Arts: In language arts, students can write about their experiences exploring 3D shapes and transforming them. Have them create a story or a descriptive paragraph about a specific shape or object. You could also incorporate vocabulary words related to shapes and transformations, such as "rotate," "flip," and "slide."
Social Studies: In social studies, students can learn about the different cultures and societies that use 3D objects in their daily lives. For example, you could discuss how different cultures use pottery or sculptures as a form of art and expression.

HFLE
Self-Esteem: Use the lesson to promote self-esteem and confidence in students. Encourage them to be proud of their creations and efforts, regardless of their abilities. Celebrate their successes and encourage them to support each other.
Communication: Communication is essential in the classroom and in life. Encourage students to communicate effectively and respectfully with their classmates when working together. They can also share their ideas and thoughts on the shapes they create, allowing for further discussion and understanding.
Positive Relationships: Encourage students to build positive relationships with their classmates. They can learn to appreciate each other's differences and work together to create something unique and special.

Elements from Local Culture:

Folk Art: Introduce grade students to Caribbean folk art, which often features bright colors and bold shapes. Have them examine and recreate patterns and shapes found in the art using concrete materials.

Traditional Games: Many traditional Caribbean games involve manipulating objects or shapes. Teach students games such as "pick-up-sticks" or "jacks," which can help develop their fine motor skills and understanding of shapes. **Musical Instruments:** Use Caribbean musical instruments such as the steelpan, 'shack shack' or drums to explore the concept of transforming shapes. Have students examine the shapes of the instruments and create their own versions using concrete materials. **Animals:** Many Caribbean animals, such as the parrot or the manatee, have unique shapes and features. Use these animals to teach students about composing and decomposing shapes and have them create their own animal shapes using concrete materials. **Landmarks:** Introduce students to iconic Caribbean landmarks such as the Pitons in St. Lucia. Have them examine the shapes and structures of these landmarks and use them as inspiration to create their own 3D structures using concrete materials.
Resources for a learner who is struggling: **Visual Aids:** Using visual aids such as pictures, diagrams, and posters can help struggling students understand the concepts better. You can create posters with pictures of different shapes and their properties or use diagrams to show how a shape can be transformed. **Hands-on Activities:** Struggling students often benefit from hands-on activities. You can use manipulatives such as blocks or playdough to help students visualize and create different shapes. You can also use real-life objects such as cardboard boxes to teach students how to transform shapes. **Simple Worksheets:** For struggling students, simple worksheets that focus on the basics can be helpful. Worksheets that have fewer problems and provide clear instructions can help students build confidence and understanding. **Online Games and Activities:** There are many online games and activities that can be used to help struggling students learn about Composing, Decomposing, and Transforming Shapes. Websites such as PBS Kids and Math Game Time offer a variety of games and activities that are specifically designed for grade 1 students. **Small Group Instruction:** Struggling students often benefit from small group instruction. You can create small groups of students and work with them on specific concepts. This will allow you to provide individualized instruction and support to each student.
Resources for a learner who needs challenge: **Tangrams:** Tangrams are a great resource for challenging grade 1 students. You can use these geometric puzzles to teach students how to compose and decompose shapes, as well as how to transform them by flipping or rotating the pieces. **3D Shape Models:** Using 3D shape models can help challenge grade 1 students who are ready for a greater challenge. You can use models such as cubes, cones, and cylinders to help students understand the different parts of a 3D shape, and how they can be transformed. **Advanced Worksheets:** For students who are ready for a greater challenge, you can use more advanced worksheets that focus on complex concepts such as symmetry, angles, and shapes in space.

Virtual Manipulatives: Virtual manipulatives such as Geoboard or Math Playground can be used to provide students with a greater challenge. These tools allow students to create and manipulate shapes in a virtual space, giving them more opportunities to explore and experiment with different shapes and transformations. **Problem-Solving Activities:** Problem-solving activities can be used to challenge grade 1 students who need a greater challenge. You can provide students with problems that require them to compose and decompose shapes or transform them in different ways.
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

Introduction to the Subject: The purpose of this unit is to help students obtain a broad view of measurement in any situation. Therefore, the focus is to enable learners to understand that measurement involves producing a numerical description of an attribute. Learners will develop an awareness that the physical attributes of an object can be measured. These attributes are length, area, mass and capacity. Subsequently, learners will be able to compare the measurable attributes of objects through the use of non standard units. Learning activities and materials are selected within culturally relevant contexts that provide the basis for forming generalisations and foundational learning. Students will be provided with experiences that require them to manipulate concrete materials. These opportunities will allow students to describe, explain, measure, estimate, make predictions and record their observations. Students will be assessed using an array of formative and summative assessments. Measurement is an important everyday activity that provides a useful link between Mathematics and real life experiences. It also provides a link between Mathematics and other subject areas.
Strand (Topic): Measurement
Essential Learning Outcome 1.1: Understanding What and How We Measure - Developing an understanding of measurable attributes.
Grade Level Expectations: Develops an understanding of what can be measured - how long it is, how heavy it is, how much it holds
Key Skill/ Concept: Observe measurable attributes of length, capacity, mass and area; representing, classifying, comparing

Specific Curriculum Outcomes:	**Inclusive Assessment Strategies:**	**Inclusive Learning Strategies:**
Learners will be expected to:	**Observation**	Vocabulary describing length: Discussion

<table>
<tr><th>Specific Curriculum Outcomes:</th><th>Inclusive Assessment Strategies:</th><th>Inclusive Learning Strategies:</th></tr>
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- **Explore physical materials and describe them using the vocabulary associated with linear measure (short/long, high/low, near/far, thick/thin, narrow/wide, deep/shallow).**
- **Classify the measuring attribute of length based on the vocabulary associated with it.**
- **Explore physical materials and describe them using the vocabulary associated with capacity (full, empty, same as).**
- **Categorise the measuring attribute of capacity based on the vocabulary associated with it.**
- **Explore physical materials and describe them using the vocabulary associated with mass of an object (heavy/light).**
- **Categorise the measuring attribute of mass based on the vocabulary associated with it.**
- **Explore physical materials and describe them using the vocabulary**

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Listen to learners as they describe the characteristics of the attribute, length, of given objects. Check to see if the learner is using correct vocabulary associated with measurable attributes (length).
Checklist to identify the characteristics of the measuring attribute-length.

Characteristics of Length	Yes	No
long		
short		
near		
far		
thick		
thin		
narrow		
wide		
deep		
shallow		

Close sentences/Matching Picture:

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- A height chart for kids is stuck on a wall at the front of the classroom. Two students from the class (who differ in height) are called to the front and are asked to stand next to the chart so that their height could be compared. Learners will observe and verbally express what they noticed about the 2 students. Guiding questions will be asked to elicit the vocabulary associated with height; tall and short. (other scenarios can be presented with a stimulus to depict tall and short objects)

.

- Teacher presents two students, one wearing a pair of short pants and one wearing long pants (uniform). Teacher will ask questions about the pants that the students are wearing. Students will respond and give reasons why one pants is short and one is long. (other examples can be presented to understand the concept of long and short)

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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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associated with area of a surface of an object (large/small).

- **Categorise the measuring attribute of area based on the vocabulary associated with it.**

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In pairs, students will discuss and match the picture to the sentence that best describes it and fill in the blank space with the correct describing word.

<table>
<tr><th>Picture</th><th>Characteristics</th></tr>
<tr><td>  </td><td>The bus is _____(close,far) to/from the building.</td></tr>
<tr><td>  </td><td>The bird is _____(high,low) up on the tree.</td></tr>
<tr><td>  </td><td>The boy is_____(near/far) to/from the tree.</td></tr>
</table>

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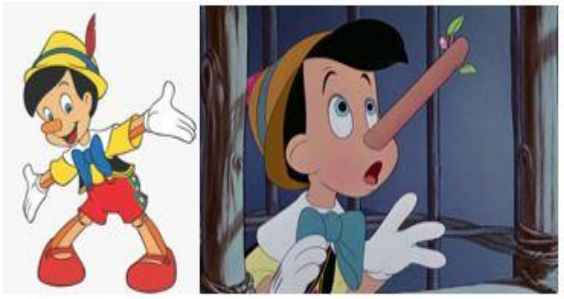
<td>

- Teacher reads the story of Pinocchio to the learners. A picture is presented as a stimulus to show his nose before and after he lied; learners will be questioned to bring out the vocabulary associated with what his nose looked like before and after lying. His nose was **short** before he lied and grew **long** after he lied.



- An item is placed on a shelf where a student cannot reach and another item on a shelf where the item can be reached. A learner will be asked to reach for both items. Learners will be asked why the student could not reach the item on the top shelf and why the student was able to reach the item on the bottom shelf: **the item on the top shelf was too high and the item on the bottom shelf was low and could be reached.**

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</table>

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:

Babies should bathe in pools that are _____(shallow,deep)

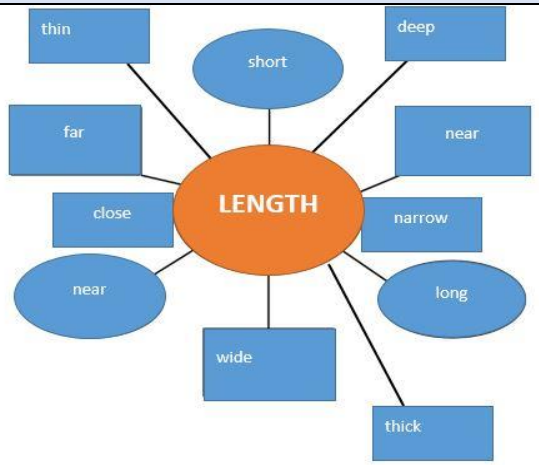
The mangoes can be easily reached because they are _____(**low,high)** on the tree.

Graphic organizer

To culminate the measuring attribute, length, a graphic organizer will be created with learners with all the describing words/vocabulary learnt about how long or short objects and distances are. A discussion will bring out the measuring attribute of **length**.

- Teacher puts two pairs of students to sit next to each other on a bench as demonstrated in the picture. Questions will be asked about the space in between them. Vocabulary such as far apart and close or near each other will be elicited from them. Also a picture stimulus with two animals and their distance to a building will be presented to the learners. The descriptors for the distance near, close and far will result from the discussion.

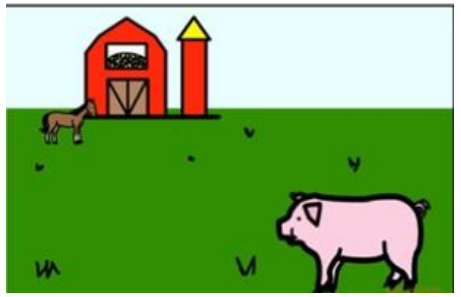
Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:



Observation and Think, Pair, Share

As the story, Goldilocks and the Three Bears is read, the teacher will take note of the responses from students about the vocabulary associated with the contents in the container (full and empty). Situations classifying empty and full containers in pictures will be done by students first using their self check table in pairs then presented orally to the class.

	Empty	Full
		



Mathematics Talks and Walks

- Take students outside on a walk where the width of two roads reflect one wide and one narrow. The students will deduce from observations and subsequent discussion that **one road is wide/broad and the other is narrow.**

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:

Observing and classifying objects that can be poured.

Teacher will observe students as they pour the items into the containers and group the objects as liquids that can be poured (takes up the space of the container) and items that can be poured and not liquid (not taking up all the space). Students will formalise the measuring attribute capacity from the activities.

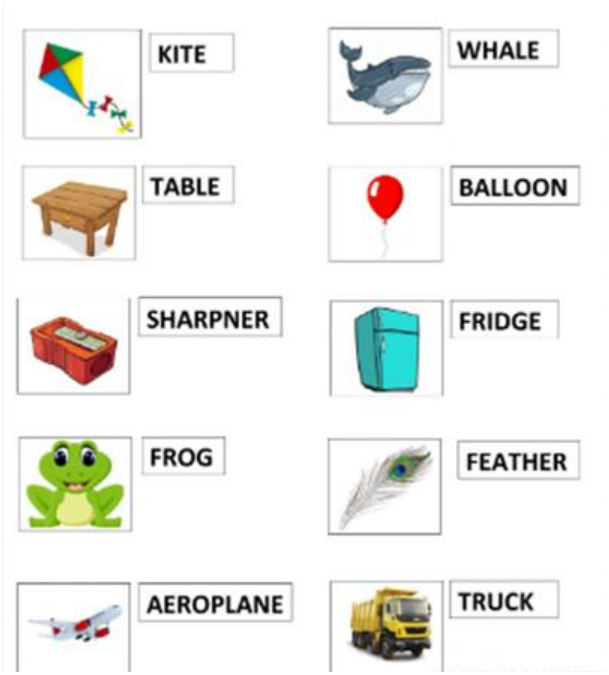
Place an X on all the items that can be poured and the container has a capacity.

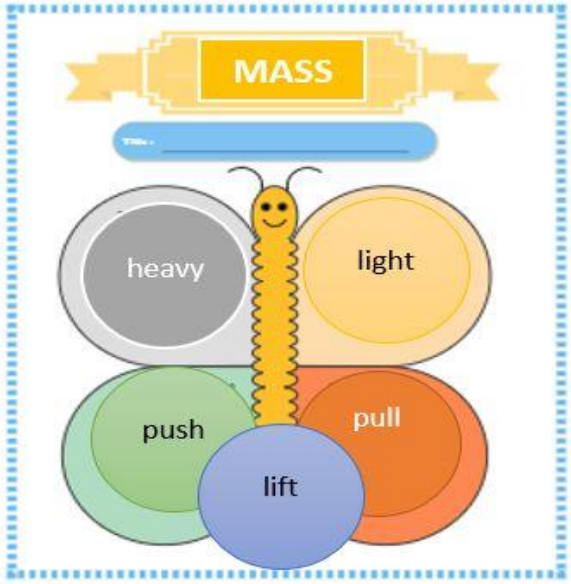
Vocabulary describing capacity

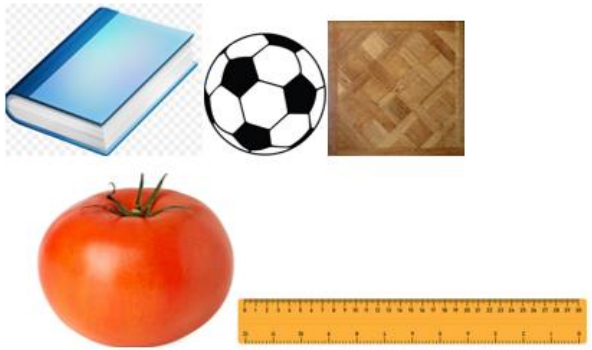
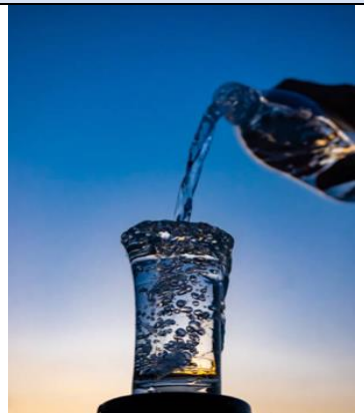
Use of hands-on manipulatives and storytelling

- The Story of Goldilocks and The Three Bears will be read to initiate the concept for learners. A stimulus picture will be presented at the end of the story to students as questions are asked regarding the contents of each bear's bowl. Responses would reflect terms such as **empty and full.**

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 **Think, Pair, Share** In pairs, think of objects that are heavy, objects that are light to carry around them and group them(pictures will be given as well for that discussion). Students will share with the class after classifying the objects as heavy or light.	• Discussion: A follow up activity discussing pictures of liquids that can fill a container will be done.  bottle of orange juice, cup of tea, glass of milk glass of water

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 **Whole Group-Graphic Organizer** All the terms associated with mass will be discussed with students and a graphic organizer will be created to assess their understanding of mass.	 Barrel of water  Tank of water • Examples and Non Examples

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 **Observation** As students engage in the pizza making process, teacher will note the vocabulary associated with the area (small and large) as they discuss the activity. **Observation**	Learners will be provided with 2 empty clear bottles. Have the learners fill up one with a liquid (water, juice, oil or milk) and the other with beans, stones, leaves or marbles. Allow learners to explore the fluidity with which the items are being poured and the space occupied in the container by the items. Students will deduce that the space is taken up by a liquid and not the other items. Discussion with a stimulus: Learners will be provided with an empty container and a jug of water (it would hold more water than the container). Allow a learner to pour the water into the empty container until it overflows. Question learners on what is taking place. Why did the water overflow? (because it is full to capacity or it is full) Question students to bring out the measuring attribute capacity, as the amount of liquid a container holds when filled or full.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Students will be presented with some objects to feel and touch them. They will describe what they feel (in terms of the surfaces). Teacher will listen for vocabulary such as flat surface/face, curved surface 	 **Vocabulary associated with mass** ● Learners will be asked the following question - Is it easier to carry a cell phone or a T.V. set? Why? Can Janie (student in class) carry a baby or can she carry the teacher? Why? (vocabulary associated with mass, heavy and light will be introduced) ● Learners will be given the picture below. Learners will be questioned on why the boy in the first image is struggling and in the second image he is not.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		 • Learners will be asked to lift/push/pull objects such as paper, bags, books, chairs, desks. Learners will be engaged in discussions about which objects were easy or difficult to lift, push, pull and why. • The teacher will engage learners in a discussion to find out why objects are heavy or light, why objects are difficult or easy to push/pull (the material it is made out of, mass determines how heavy or light an object is). The measuring attribute will be defined there and a graphic organizer will be created. **Vocabulary associated with area** Use of a realistic experience - Pizza Making • In groups, students will each be given pizza dough in the shape of a circle, rectangle and

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		oval. Learners will spread pizza sauce on the entire surface of the dough using a spoon or their hand. Questions will be asked during the process such as: what part of the dough did you cover with the sauce? (the surface, the entire space). Learners will then spread toppings of their choice all over the surface of the dough. Again questions will be asked, what space was covered. The term **area** will be elicited from students as they engage in the process. Students will eat their pizza after it has been baked and again questions will be asked as to the size eaten (a slice, a piece, an area of the pizza) in relation to what was left.  ● Hand art: Learners and the teacher will be engaged in creating a handprint painting wall. Discussion will take place about the region represented by the handprints (the area of their hand). Learners will describe the space

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		covered by their handprints and the teacher's handprint as the area (small and large areas).  • Real life manipulation of objects: Students will engage in touching surfaces of various objects and describe how they feel (flat and curved surfaces). Students will recognize that objects around us have flat and curved surfaces. They will discuss how easy it is to feel/touch/see the area of flat or curved surfaces.

Inclusive Resources and Materials from Regional Specialists

pencils
erasers
building blocks
book bags
plastic bags with items
cups
bowls
containers
water bottles
playdough

book
blocks
paper
handpaint
desk
tags
bottle caps

Additional Resources and Materials

Story Books - Goldilocks and the Three Bears; Jack and the Beanstalk; Pinocchio

https://www.youtube.com/watch?v=pe7nVxkqSmI

https://www.youtube.com/watch?v=JjKhSyUVFBI

Opportunities for Subject Integration:

Science:
- Plants: Growth of seedlings
- Life cycle of animals
- States of Matter

Language:
- Using appropriate language for descriptions; antonyms and synonyms
- Developing communication skills

Physical Education:
- Track and field events; how long a distance is, how short a distance is. Cricket ball throw - throw far distance
- Swimming
- Fun sports

Art and Craft:
- Create objects with playdough
- Painting - painting or colouring within an area;
- Creating Hand prints

Health and Family Life Education:

- Cooperative learning skills
- Valuing peers contributions
- Listening while other students speak

Social Studies:

- Communicating and working with peers
- Description of family members
- Identity - Unique hand prints

Music:

- Notes
- Musical sounds on containers (glasses) when they are empty, full, half full etc

Vocabulary: Measurement

light heavy thick thin shallow deep near far short tall long high low full empty surface area narrow wide length mass capacity

Elements from Local Culture:

Germination of seeds/farming: seedlings - tall and short
Playground - use of seesaw
Sporting events

Resources for a learner who is struggling:

- Use of assistive devices such as computer with read to text speech when needed
- Use verbal prompting at every stage of the learning activity
- Stories being read aloud
- Varied manipulatives: manipulatives with raised surfaces

Resources for a learner who needs challenge:

Use of images to state the difference among objects based on a specific attribute and give reason why it is different.

Objects in the environment you can find the length, capacity, mass and area of.

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):

Introduction to the Subject:

The purpose of this unit is to help students obtain a broad view of measurement in any situation. Therefore, the focus is to enable learners to understand that measurement involves producing a numerical description of an attribute. Learners will develop an awareness that the physical attributes of an object can be measured. These attributes are length, area, mass and capacity. Subsequently, learners will be able to compare the measurable attributes of objects through the use of non standard units.

Learning activities and materials are selected within culturally relevant contexts that provide the basis for forming generalisations and foundational learning. Students will be provided with experiences that require them to manipulate concrete materials. These opportunities will allow students to describe, explain, measure, estimate, make predictions and record their observations. Students will be assessed using an array of formative and summative assessments.

Measurement is an important everyday activity that provides a useful link between Mathematics and real life experiences. It also provides a link between Mathematics and other subject areas.

Strand (Topic): Measurement

Essential Learning Outcome 1.2: Understanding What and How We Measure - Comparing and ordering based on measurable attributes

Grade Level Expectations: Direct comparisons of two objects based on one attribute. Can predict which is longer/shorter or heavier/lighter or larger/smaller or more/less given a set of objects and explains reasoning.

Key Skill/ Concept: Observing, predicting, comparing

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

- **Learners will be expected to:**
- **Compare the length of two objects using direct comparison (i.e: place side by side and align one end) and explain reasoning using appropriate vocabulary; (shorter/longer, higher/lower, deeper/shallower, nearer/farther, thinner/ thicker, wider and narrower).**
- **Compare the mass of two objects (lifting, pushing, pulling and balancing) and explain reasoning using appropriate vocabulary;**
- **Compare the capacity of two objects (filling and emptying) and explain reasoning using appropriate vocabulary (such as more or less, level is higher than or less than). .**
- **Compare the area of two objects using direct comparison(i.e**

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Observation

Listen to the discussions at various stations on which objects are shorter, longer and taller. Pay attention to the skills applied and the reason for selection. Make use of observational checklists.

Checklist

<table>
<tr><th>Criteria for comparing two objects based on length or height

Did the children?</th><th>Yes</th><th>No</th><th>Needs Practice</th></tr>
<tr><td>Place both objects on the same flat surface to compare their height</td><td></td><td></td><td></td></tr>
<tr><td>Identify taller or shorter objects</td><td></td><td></td><td></td></tr>
<tr><td>Use the same start point to compare the length of the two objects</td><td></td><td></td><td></td></tr>
</table>

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Inclusive Learning Strategies:

Create learning stations, with objects to measure length and objects to measure height. Have learners observe two similar concrete objects of different lengths and heights such as pencils, bottles, crayons, ribbons. Check to see if they make use of a start line to compare objects. Before they can compare objects to find out which is longer, the end point of both objects must be arranged in a straight line. In comparing which object is taller, ensure that both objects are placed on the same flat surface. Then, allow students to make use of activity cards to record observations. Label materials using letters or names to facilitate independent learning.

Sample of Activity Cards.

<table>
<tr><td>Longer</td><td>Shorter</td></tr>
<tr><td></td><td></td></tr>
</table>

<table>
<tr><td>Taller</td><td>Shorter</td></tr>
</table>

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

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Assessment Strategies:
which one occupies more space) and explain reasoning using appropriate vocabulary (such as bigger and smaller).	<table><tr><td>Recognize the longer and shorter object.</td><td></td><td></td><td></td></tr><tr><td>Explain why objects must be aligned before they can be compared.</td><td></td><td></td><td></td></tr></table> **Which Mathematician is Right?** Provide students with a task sheet with objects identified as longer than or shorter than other objects. Have students determine which is correct and explain why. **Observation** Pay attention to which objects students are trying to send the hoop around after instructions are given. eg. Send the hoop around the object which is nearer to you. With this instruction, focus on whether students are attempting to send the hoop around the object which is nearer or farther. **Observation: Think, Pair, Share** Listen as students make statements of comparison. Question students to find out their reasoning for such statements. Watch as students pick their cards to show that they have completed their task. Provide opportunities for children to share their	<table><tr><td></td><td></td></tr></table> Allow students to play a game of Scavenger Hunt. Provide students with an object and have them find objects hidden around the class which are shorter than, longer than or equal in length to the objects given. Activity Card For Scavenger Hunt <table><tr><td></td><td>Shorter than</td><td></td></tr><tr><td></td><td>Longer than</td><td></td></tr><tr><td></td><td>Equal in length to</td><td></td></tr></table> Allow students to choose objects which are nearer and farther than a particular object. Use

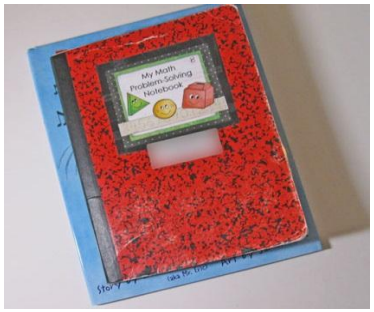
Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Assessment Strategies:
	findings. Pay careful attention to the use of the words higher and lower in the explanations given. **Task Cards: Ming models** Observe as learners glue sticks to make models of a thicker, thinner, narrower and wider shelves. Provide students with the opportunity to show their work and explain by making statements of comparison. **Think, Pair, Share** Have every child to show their objects to their pairs, identify which is lighter or heavier. Question students to further explain why they made such a comparison statement. Have them work in a small group to verify their answer using a hanger balance scale. Allow students the opportunity to present and explain their findings. Observe learners as they complete their task. **Observation - Group Formation Activity** Have students form three groups: lighter than, heavier than or equal in weight. After students take turns on the seesaw with their partner, they fit themselves in the right groups. After the activity, have each child state their position in comparison to their partner. E.g. I am heavier than Joe. **Group Activity:**	questioning techniques to help them make statements of comparison with reasoning. eg. *Can you tell me which object is nearer to the book? Why would you say that this object is nearer to the book?* Take students outdoors and allow them to play a game of hoopla, in small groups. Place objects nearer to line and further away. Have students stand at the line and try to send the ring onto the object that is farther and nearer. The learner who is able to send the ring around the correct object gets to keep that object. This activity can be done not only with a ring but with ball throwing. Have students sing the hymn song Higher, higher by Christafari. Allow students to make the actions while singing higher, higher and lower, lower. Question students to bring out the meaning of higher and lower. eg. *How high are we lifting Jesus? How low are we to bring satan?* In pairs, take students out to fly kites. Have them to compare by stating which is higher or lower? Allow students to choose a yellow card if their kite is lower than their pairs and a red card if it is higher. Read this short story to students.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Assessment Strategies:
	In groups, have them select two objects. One which can be pushed or pulled and one which they can't. Provide learners with the opportunity to present objects to the class giving explanations with reasoning. Pay attention to the use of the terms heavier than and lighter than. **Demonstration Station** Allow students to visit different demonstration stations. Have groups explain the process they followed to determine which bottle holds more or less liquid or equal amounts of liquid. Allow students to ask questions if they need to know anything more about the process followed. **Think, Pair , Share** Pay attention to students as they compare the surface area of the books chosen. Let them discuss in pairs, as they make statements of comparison. Provide students with the opportunity to share with the class.	**The Birthday Prank** Peter received a nice yellow bookshelf from his uncle as his birthday present. He was extremely happy and could not wait to stack all his story books on it. When he placed the first book on the shelf, half of it could not fit. He was a little disappointed but decided to continue to stack his books. As he placed the second book on the shelf it broke in two. Peter was so disappointed his eyes got filled with tears. He decided not to cry but find his uncle to vent his anger instead. As soon as he rushed out the door he saw another bookshelf, just as small and painted in the same bright yellow colour. His eyes lit up and a smile formed on his lips, wiping away his anger and disappointment. He hastily dragged it in and started to stack his books once more. The first book fit perfectly. After stacking all ten books on the shelf, Peter moved back and watched with joy and satisfaction. Ask students the following questions. *Why was the book unable to fit on the first bookshelf?* *Why did the bookshelf break so easily after he placed the second book?*

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Assessment Strategies:
		Why did the book fit perfectly on the second shelf and not the first? *Why did the second shelf not break after placing all the books?* Then in groups, have students use manipulatives such as popsicle sticks to create shelves to show the comparison between thinner and thicker, narrower and wider. Take students on a walk to collect two objects. Have them determine which is heavier or lighter. Ask questions such as: *Are you certain that this is heavier or lighter than this? What can we do to check to see if we are right?* In groups, allow students to use a hanger balance scale. Have them measure objects by putting one in each pot, make observations and statements of comparison with reasoning.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Assessment Strategies:
		 Take students to the playground, allow them to use the seesaw as a balance or create seesaws using a plank of wood and a bag of sand to determine which pair is lighter than, heavier than or equal in. Take learners on the outside to observe things in their surroundings. While on the outside, direct students' attention to various objects that can be pulled or pushed. Ask questions to help them to develop the understanding that lifting and balancing are not the only attributes of weight. Pushing and pulling can also help them to determine heavier and lighter objects. Questions? *Do you think it will be easier to push this car or this bin? Why?*

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Assessment Strategies:
		What about this water tank and this lunch table? Why? *Why do you think you can push these two items and not these two?* Provide each group with a container filled with water and two other containers or two bottles of different shapes and sizes. Try to also include containers of different shapes which hold the same amount of liquid. Using a small ¼ cup, have students fill two containers at a time. Create opportunities for students to do the reverse. Provide students with containers or bottles of water and have them empty them by using a third object. Question students to find out which one holds more or less liquid. Which holds more than, less than or equal amounts. Have students listen as you read this scenario: Tony wants to create a postcard for his mother. He has a lot of things he wants to write to his mother. He also wants to draw a few of his mother's favourite flowers. *Which of these two papers should he use to create his postcard? Why? How*

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Assessment Strategies:
		can we prove that this one has a bigger surface area than this one? Encourage students to demonstrate their rationale by placing paper one on top of the other to show the difference in their surface area. Allow students to find books with smaller and bigger surface area than their Mathematics notebook. 

Useful Content Knowledge for the Teacher about the Outcome:

Learning to measure will improve students' ability to estimate, count, and record data. These are essential life skills that kids should learn. Giving students the chance to measure through thoughtful and well-planned activities will aid in their development of measurement skills and strengthen their understanding of number sense.

Points to remember when teaching students to Measure

When comparing the length of two objects, it is important that both ends of the objects are lined up.

It is not always possible to compare two things through observation. When it isn't, it can be helpful to use a third object that can be directly compared to each of the other two and serve as a point of comparison.

Measuring Length

The attribute of length needs to be taught using practical situations in which they occur. For example, the length, width, depth, height, thickness or closeness of objects. In making comparisons between two objects based on any of these attributes, the use of words such as longer, shorter, nearer, farther, deeper, shallower, higher, lower, thicker and thinner should be used.

- The length of an object describes how long an object is from one horizontal point to the next. E.g., The blue pencil is longer than the red one.

- The height of the object states how tall it is from the surface moving upward. E.g., This girl is taller than her brother OR the second kite is higher than the first one.

- The width indicates how broad an object is. E.g. The first footpath is wider than the second one or the second footpath is narrower than the first one..

- The depth of an object is measured from the surface to how low it will go downwards. E.g. The second container is deeper than the first. Therefore, the first container is shallower than the second.

- The distance is how far one thing is from another thing. E.g. The distance from the school to the road is farther than the distance from the school to the church.

- Thickness is the measure of the distance between two sides of something. E.g. The first book is thicker than the second one.

Measuring Weight

Mass is a measure of how much matter is in an object. We can compare the mass of two objects by measuring the force of pushing or pulling the objects or by lifting and balancing objects. To make a comparison between two objects we use words such as heavier or lighter.

- When comparing the mass of two objects by pushing or pulling, the heavier object resists change or movement more than the lighter object. E.g. Pulling an empty cart and a cart full of stones.

- When comparing the mass of objects by lifting, have kids stretch out their arms like a balance scale to help them to determine which is heavier or lighter.

- When balancing using the hanger balance model, the heavier object is pulled down while the lighter object is pushed upward. If they are of the same mass, it remains the same.

Measuring Capacity

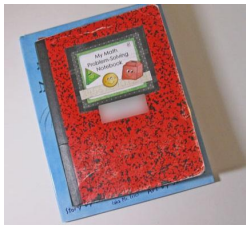
The term capacity is the measure of the amount of liquid a container can hold. To compare the capacity of two objects which are of the same shape, size and height, we can use the term more or less liquid than the other.

- For bottles or containers which are not the same, have students use a third object to empty or fill the objects to compare the capacity.

Measuring Area

The area is the measure of the total space taken up by a flat surface or shape of an object. To compare the area of two different surfaces, we can try to measure the area by trying to figure out which surface is bigger or smaller.

- If it is not possible to see the difference in their area through observation, cover one surface area of the object with the other.



Inclusive Resources and Materials from Regional Specialists (*texts, family & community knowledge and resources, contextually relevant professional web resources*)
Mighty Maddie by Stuart Murphy
How Short. How tall, how far away by David Adler
Me and the measure of things by Joan Sweeney
https://www.weareteachers.com/teaching-measurement/

Additional Resources and Materials

sticks
bottles
pencils
crayons
books
paper
square tiles
bottle caps
hangers
paper plates
building blocks
cups
container
balancing scales or self made devices

Opportunities for Subject Integration:

Language Arts

- use adjectives to compare objects.
- making statements of comparison
- explaining using sequencing
- discuss and give reasonable explanations for decisions made
- making predictions
- listen to story situations, analyse and make decisions
- demonstrate good communication skills

Art and Craft

- Create objects to make comparison between quantities
- Trace shapes to create visual representation of surface area
- Draw shapes to compare attributes of length
- Hand prints or objects to demonstrate/compare difference in surface area

Social Studies

- cooperation within groups

- accepting roles and responsibilities
- respect for others and their opinions
- recycling materials found in the environment for comparing measurement attributes

Science and Technology

- Living things in the environment and how they grow.
- States of Matter and Materials
- Force : Understanding the concept of balanced and unbalanced forces,push or pull
- Simple Machines

Health and Family life

- stages of development
- exercise cooperative learning skills
- demonstrate good judgement and decision making skills
- show willingness to listen to the opinion of others

Music

- singing
- clapping to rhythm

Physical education

- developing games to stimulate the mind
- track and field rules and regulations(start point, length, distance ran)

Elements from Local Culture: *(References that learners might know from their local environment*

Use of the seesaw on the the playground to explain heavier and lighter mass
Tug of war
Pan balances

Vocabulary

higher lower bigger smaller longer shorter taller deeper nearer farther shallower distance

thicker thinner surface area heavier lighter more less equal same

Resources for a learner who needs challenge:
Comparing three objects based on the attributes of length, mass, capacity and area.
Use non standard units to compare areas of different shapes both regular and irregular.
Trace surface area of the six faces of cuboid and cube shaped objects and use square tiles to estimate the area of each side.

Strategies that Support the Curriculum and Assessment Framework

Elements that are integrated across subjects:

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

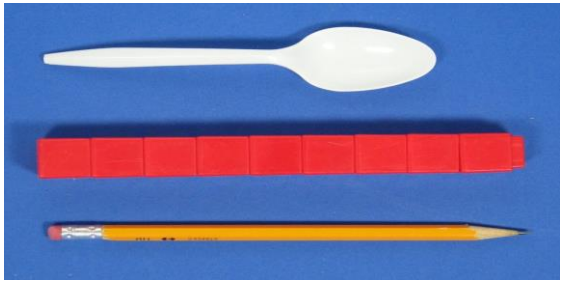
Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

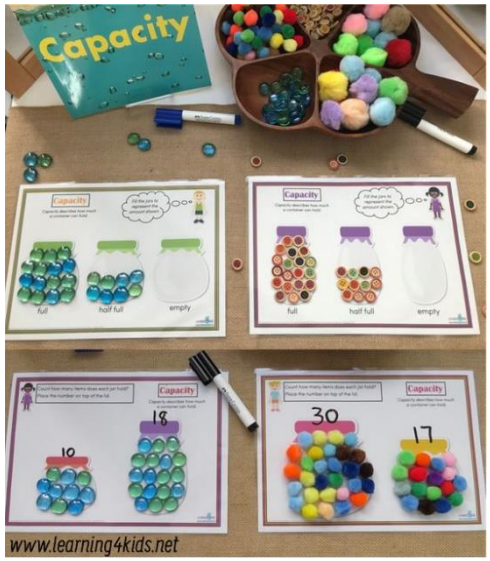
Introduction to the Subject: The purpose of this unit is to help students obtain a broad view of measurement in any situation. Therefore, the focus is to enable learners to understand that measurement involves producing a numerical description of an attribute. Learners will develop an awareness that the physical attributes of an object can be measured. These attributes are length, area, mass and capacity. Subsequently, learners will be able to compare the measurable attributes of objects through the use of non standard units. Learning activities and materials are selected within culturally relevant contexts that provide the basis for forming generalisations and foundational learning. Students will be provided with experiences that require them to manipulate concrete materials. These opportunities will allow students to describe, explain, measure, estimate, make predictions and record their observations. Students will be assessed using an array of formative and summative assessments. Measurement is an important everyday activity that provides a useful link between Mathematics and real life experiences. It also provides a link between Mathematics and other subject areas.
Strand (Topic): Measurement
Essential Learning Outcome 1.3: Understanding What and How We Measure - Developing and applying non-standard units of measure.
Grade Level Expectations: Can use non-standard units to measure attributes, e.g. uses blocks, hands span, toy cars, etc to measure length, uses square, palms, etc. to measure area; uses blocks, sand, little stones, etc to see which container holds more.
Key Skill/ Concept: Estimating, measuring, reasoning, justifying

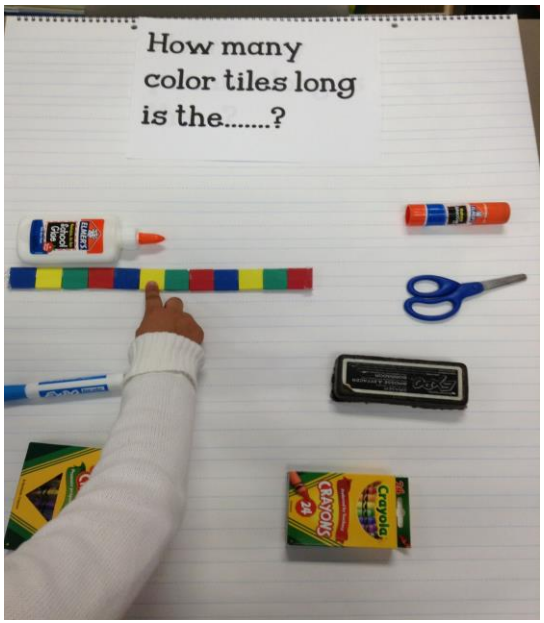
Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Learners will be expected to: **Knowledge** • **Measure length, mass and capacity using non standard units** • **Select appropriate non standard units to measure different attributes.** • **Compare the capacity of two containers to determine which holds more.** **Skills** • **Use parts of their body to conduct non-standard measurement. (Palms, hand span, foot span)** • **Use objects to conduct non-standard measurement. (little stones, blocks, sand, toy cars, paper clips etc.)** • **Estimate and measure the mass and length of objects using non-standard measurement.** • **Apply the correct non-standard measurement to measure various items.**	**Observation** Observe pupils as they select non standard units to measure the different attributes. Make notes of students' reasoning as they discuss among themselves the difference in their answers. **Games** Students would use the appropriate non-standard measurement to measure items. Hands Span, toy cars, foot span -length Stone & sand - capacity Hand span and squares - area Estimate the non-standard measurement then measure the object. Students should justify their reasons for their estimated non-standard measurement. Compare the length of an object (pencil) to the length of two or three smaller objects. (eraser, sharpener)	Give students opportunities to identify objects that can be measured? Ask students to make direct comparisons between two objects according to length, mass, capacity. Ask students, "What do we want to measure?" Make a list of attributes that are measurable. Ask students to make predictions about attributes. Give students opportunities to say which object is heavy/light, lighter/heavier etc. Provide opportunities for students to collect objects and sort them based on measurable attributes. Give students opportunities to explore objects and make comparisons between and among them – length (which longer/shorter, shorter); mass – heavier/lighter and capacity – (more/less). Give students opportunities to manipulate with given objects and make predictions which is longest/shortest or heaviest/lightest or smallest/largest or most/least. Give students opportunities to look at situations to arrive at some non-standard units - length, mass and capacity e.g. length – hand span, cubit, foot span, stride or step etc., Mass – estimating with your hands, scale, balance etc. Capacity – use of containers, bottles etc.

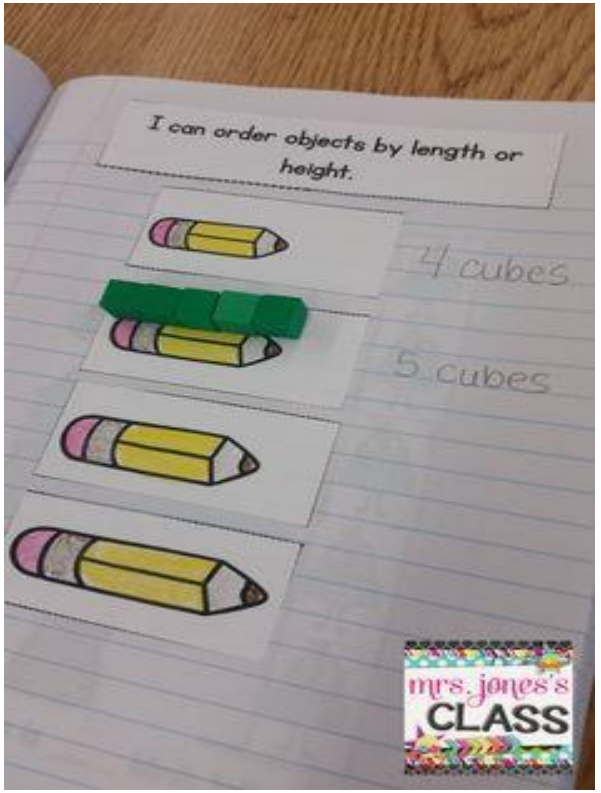
Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Example: You would not use a hand span to measure capacity. **Values** • **Show enthusiasm using non-standard measurement to measure objects.** • **List examples when they estimate measurement in their everyday lives.** • **Appreciate the importance of using estimations in everyday situations.**	 Source:https://www.shutterstock.com/image-photo/pencil-eraser-isolated-on-white-260nw-77854333.jpg Compare a surface space with two different size and shape leaves. (how many banana leaves/other leaves can cover the chalkboard etc?.) (How many table mats,coasters can cover a table surface?) Use blocks or tiles to build something longer than, same as shorter than half as long as a given object etc.	Using the following strategies, ask students to use their senses to compare: What 'looks' bigger? 'feels' heavier, etc. Provide opportunities for students to predict which is longest/shortest or heaviest/lightest or largest/smallest or most/least given a set of objects and explain reasoning. Give students opportunities to look and determine their lengths e.g. the desk top is so many pencils long etc. Give students opportunities to say which object is heavy/light, lighter/heavier and lighter. Give students opportunities to look at containers/vessels and state which holds more/least, arranging those objects in ascending/descending order. Give students opportunities to explore objects and make comparisons on them – length (which longer/shorter, shorter); mass – heavier/lighter and capacity – (more/less). Give students opportunities to estimate, measure and compare the numbers of paper

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 Source:https://i.pinimg.com/originals/26/ca/f4/26caf47d02831c30daa486a915baefd0.jpg	clips, pencils, etc., needed to measure the length of the same object. Allow students to estimate, measure and record lengths, heights and distances. (e.g., a book is about 10 paper clips wide; a pencil is about 3 toothpicks long). Have students estimate, measure and describe area using non-standard units (e.g., It took about 15 cards to cover my desk, with little space left over). Have them estimate, measure and describe the capacity and/or mass of an object, through investigation using non-standard units. (e.g. My book has the same mass as 10 pencils. The 3 juice cans have the same capacity as my water bottle). 

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		Source:https://i.ytimg.com/vi/4qmmsSCJUGw/maxresdefault.jpg **Experiment** Students work in groups or pairs to estimate measurement using non-standard units using objects above.  *Source:https://images.squarespace-cdn.com/content/v1/5980d56fb8a79b3cf086de1c/1502398432465-X7R8R2U1HYASN5L4KK55/nonstandard-unifix.jpg?format=1000w* Students cover the surface of items using different sized squares or palms.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		Students compare measurements using non-standard measurement in groups or pairs. **Math Talk** Students then discuss their findings. ("Why is his or her measurement more or less than yours?" "Why is there a difference in the measurements?") Students use different size containers to determine which holds more. 

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		Source:https://i.pinimg.com/564x/a6/88/9f/a6889f05b2d866de92eaa75e0874976c.jpg  Source:https://i.pinimg.com/originals/bb/f7/4b/bbf74b21ca821d3d136ca84367e6a2e1.jpg

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
		 *Source: https://i.pinimg.com/236x/0f/b5/13/0fb513d7897ad4f6dc1ea4d7c7a1b133--measurement-for-kids-measurement-st-grade.jpg* Provide students with three or more objects and have them compare the three.

Useful Content Knowledge for the Teacher about the Outcome:

The term 'non-standard units of measurement' refer to 'measurement units that are not commonly accepted as standard but are applied uniformly when measuring (e.g., paperclips, pencils, toy cars etc)

Non-standard units are not typically used for measurements. The units that are used have no fixed margins and may vary from person to person or depend upon the shape and size of the object used for taking measurements.

Read more: http://teachmefinance.com/Scientific_Terms/non-standard%20units%20of%20measurement.html#ixzz7xqB4RwYI

Additional Resources and Materials: Blocks, pencils, sand, seeds, paperclips, etc.

Online sites: NonStandard Units of Measuring - YouTube

Opportunities for Subject Integration:
Mathematics -
Science - Use non-standard measurement to measure the growth of plants over a certain period of time.
S.Studies - Estimate the distance using foot span, of different places in their school's community.
L.Arts - Describe the length of objects using appropriate vocabulary
HFLE -
Creative Arts - Silent gallery walk displaying items measured with non-standard measurement.

Resources for a learner who is struggling:

Online Games:https://wordwall.net/resource/3047001

https://wordwall.net/resource/2897559

Resources for a learner who needs challenge:

Strategies that Support the Curriculum and Assessment Framework

Elements that are integrated across subjects:

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

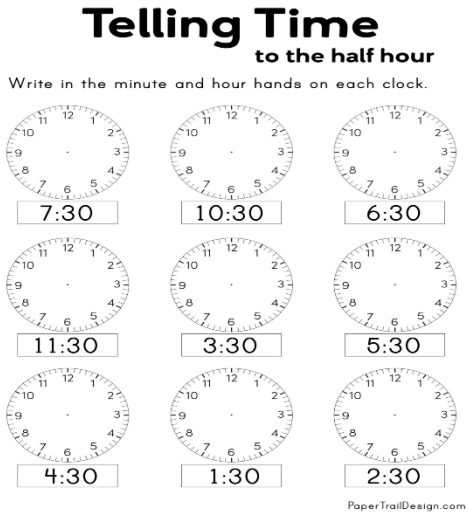
Items of Inspiration (teaching tips, inspirational passages, connections to educational research):

For this aspect, continued use of concrete and pictorial materials are necessary to enhance and aid in students' understanding of measurement.

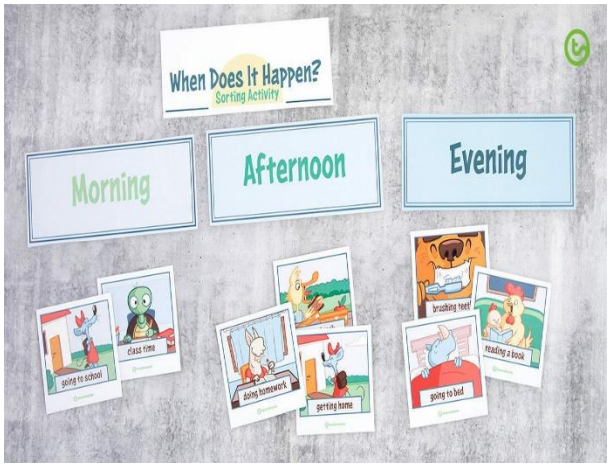
Introduction to the Subject: The students, having understood that through the use of non-standard units of measure there are multiple answers, there is now a need to establish standard units of measures. Students will then be introduced to time and money and the standard unit of measurement associated with them. Through the use of the calendar and authentic activities students will be provided opportunities to demonstrate their knowledge of time. Additionally, they will navigate the analog clock to identify its parts and become familiar with representing time on the digital clock. They will also be provided opportunities to manipulate coins in circulation and know the value of each.
Strand (Topic): Measurement
Essential Learning Outcome 1.4: Understanding What and How We Measure - Developing and applying standard units of measure.
Grade Level Expectations: Read the date on a calendar, and use a calendar to identify days, weeks, months, holidays, and seasons. Tell and write in hours and half hours using analog and digital clocks. Identify 25c, 10c, and 5c and relate their values to pennies.
Key Skill/ Concept: Comparing, sorting, representing, identifying, partitioning

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Learners will be expected to: **Knowledge** ● **State the days of the week, months of the year and holidays.** ● **Explain the composition of days for week, weeks for month and months for year.** ● **Identify the months in which various holidays occur.** ● **Identify 5c, 10c and 25c and relate their value to pennies (1c)** **Skills** ● **Read the date on the calendar.** ● **Interpret details on a calendar.** ● **Represent and recognize time on the hour and half past the hour on the analog and digital clock.** **Values** ● **State their birthdate with pride.**	**Online Games** Select the correct day to complete the sentences: https://wordwall.net/resource/22419293 Put the months of the year in the correct order: https://wordwall.net/resource/363117 **Writing** With the aid of a calendar in small groups students construct a story or poem utilising the days, months or dates in a sequential order. For example, where there are many students with the same birth month they can identify each birthdate in sequential order.	Provide opportunities for students to read the calendar to figure out what day and to familiarise students with the days of the week, months of the year and the structure of written dates.  Retrieved from: https://www.education.com/lesson-plan/calendar-creation/

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **Be willing to share the date every morning in class.**	Use a calendar to mark special days celebrated in their country.  **Art:** Draw images to represent their favourite month of the year. Complete the days of the week or months of the year starting from a given day or month. (Complete by filling in the days of the week from Thursday, ——-, ——-,----------) **Time on the Clock**	Ask students to create their own questions about the calendar to swap with another student to answer. **Sing Along** Have students and teachers sing songs and recite nursery rhymes related to days of the week and months of the year (For example; 'There are 7 days in one week…', 'Months of the year are: January, February, March,...' **THERE ARE SEVEN DAYS** **There are seven days; there are seven days, there are seven days in the week** **Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday** **What's today?** **Today is (Tuesday), happy (Tuesday) happy (Tuesday) everyone** **Happy (Tuesday), happy (Tuesday) happy (Tuesday) everyone** Source:https://i.pinimg.com/originals/aa/b0/e4/aab0e43be084243839fe351d626317bb.jpg

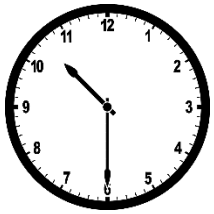
Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Students complete a worksheet in which they draw hands to show time on analog clocks.  Source:https://www.papertraildesign.com/wp-content/uploads/2022/06/Telling-Time-half-hour-3.jpg	Every morning, teachers and students sing the morning song which states the current day. Song: Months of the Year:  Months of the Year Song | Song for Kids | The Singing Walrus - YouTube **Student Observation** Get your students to work out how many days they have been in school using the yearly calendar. Get them to also work out how many days to other significant events such as Christmas, their birthday or the school holidays. You could also have your students create their own questions to swap with another student to

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Students work in pairs to tell the time using their bodies.  Source:http://lovepreschool.weebly.com/blog-love-preschool/making-a-human-body-clock-telling-time **Online Games:** Tell the time on the clock: https://wordwall.net/resource/24859817 https://wordwall.net/resource/32922747 https://wordwall.net/resource/54049357 https://wordwall.net/resource/363099 Students match a series of activities to the correct time of the day when each activity occurs.	answer. Students observe a calendar to identify the months, days and dates. Days of the month poem:  Source:https://i.pinimg.com/originals/69/db/bb/69dbbb198149e980f5ff755e2ba87f15.jpg **Time on the clock**

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	'When Does It Happen?' Teacher shows students different pictures displaying different things done during the day. Students state what time of the day the activities take place.  Source:https://fileserver.teachstarter.com/thumbnails/36309-14-terrific-time-resources-thumbnail-0-1200x628.png Students can justify their answers if they differ. For example, a student may say he or she takes an	Sing and play the game 'Mr. Wolf…'  Source:https://himama.s3.amazonaws.com/uploads/learning/learning_media_file/image/file/599/medium_hm_learning_activities_mini_magick20210818-4-18jocb3.png Have students manipulate model clocks to show the position of the hour hand when it is half past the hour.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	afternoon nap and another may say it only happens in the evening. **Oral Questioning** Students identify the features of the different coins in their country through comparing and contrasting all the coins. Sort and arrange the coins according to value.  Source:https://i.ytimg.com/vi/xp-WVG0c1Co/maxresdefault.jpg Give combinations of coins that give a total value of 10c and 25c.	 Source:https://static.mamanpourlavie.com/uploads/images/articles.cache/2011/01/13/file_main_image_5733_2_temps_enfants_01_5733_1500X1000_cache_1200x630.jpg Students free talk and tell the class what time they do various activities during the day.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 *Source:https://i.pinimg.com/736x/37/17/6a/37176a17649014f9cf1dbf012362fe1a--money-games-maths-money.jpg* Sort given coins according to their values (5c, 10c, 25c) 	 Source: https://media.istockphoto.com/id/923721584/vector/daily-routine-activities-for-kids-with-cute-boy.jpg?s=612x612&w=0&k=20&c=uOhx1TgS5I6ITFSDatBgXBwcgm06WXBKZqUe6QJQ_LI=

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Source:https://www.ebay.com/itm/294344231307  	Have students simultaneously monitor the live clocks (analog and digital) throughout the day to observe and compare time on the hour and half past the hour.   Source:https://www.valcom.com/products/productdetail/v-d2440bSource:https://etc.usf.edu/clipart/34200/34224/nclock-10-30_34224.htm **Hands on learning** Have students trace the different coins using paper and pencil to remind them of their features.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Source:https://files.liveworksheets.com/def_files/2021/2/5/10205204720125649410205204720125649 4001.jpg	 *Source:https://i.ytimg.com/vi/5jULu6VuH-Q/maxresdefault.jpg* Have students count in 5's using the 5 cent coins. Have students count in 10's using the 10 cent coins up to 100 cents. Have students guess the value or number of the coins used to match a stated number of a given coin; or a stated value (For example, *I have three coins that give a total value of 20 cents.What are the coins that I have? I have three coins in my hand. What is the value of the coins I have?*)

Useful Content Knowledge for the Teacher about the Outcome:

Days - There are 7 days in one week. A new week begins on Sunday. Students should be able to list the days of the week in the correct order.

Months - There are 12 months in a year. The first month of the year is January and the last month of the year is December. One holiday recognized in almost every part of the world is Christmas Day. This is celebrated on the 25th of December. Students should be able to list the months of the year in the correct order and state one holiday celebrated in their country.

Time - A clock is used to tell the time. There are two types of clocks: digital and analog clocks. The analog clock uses hands to show the time, while the digital clock uses numbers to tell the time. The long hand on the analog clock tells the minutes and the short hand tells the hours. The long hand on 12 says o'clock as well as the two zeros on the digital clock. The long hand on the 6 says half past and the number 30 behind the colon says the same. Students should be able to draw hands and write numbers to show different times and look at clocks and say the time shown.

Money - The Eastern Caribbean currency is used in some Caribbean countries. The coins used are 5 cents, 10 cents, 25 cents and 1 dollar. Students should be able to identify the coins used in their country and combine coins to make a required value.

Additional Resources and Materials: Calendar, Clock, EC coins,

Online Games (days of the week): https://wordwall.net/resource/16999125

https://wordwall.net/resource/22674111

Opportunities for Subject Integration:

Mathematics - Students answer questions on data handling from the story, 'The Hungry Caterpillar' saying what the caterpillar ate on each day.
Science - Distinguish between day and night based on pictures of different activities (children looking at stars, a boy going to school , a family having dinner etc)
Social Studies - Create a timeline to show important dates in their country (New Year's Day, National Heroes' Day, Christmas Day etc)
Language Arts - Students compose stories or poems incorporating the days of the week and months of the year.
HFLE - Students identify the time when they take different medications. (Every 4 hours, 1 hour before meal, etc)

Creative Arts - Create analog clocks using simple materials; create a chart depicting the activities in which they engage on a daily basis
Elements from Local Culture: Pupils use 4 twenty-five cents to pay for transportation to and from school. They also use multiple twenty-five cent pieces to pay for their daily lunches at school whether it be 75 cents or $1.00.
Resources for a learner who is struggling: Students trace/shade the coins on paper with their pencils.
Resources for a learner who needs challenge: **Identify the different money in your country: https://wordwall.net/resource/30570306**
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):

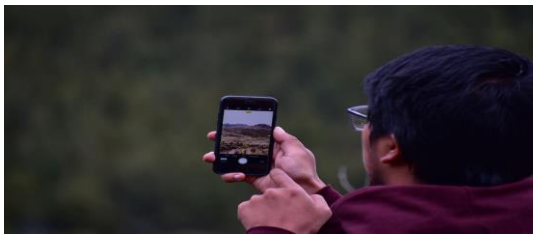
Story Book - Chickens to the Rescue - John Himmelman

- Cookie's Week - Cindy Ward and Tommie dePaola

Data Handling and Probability

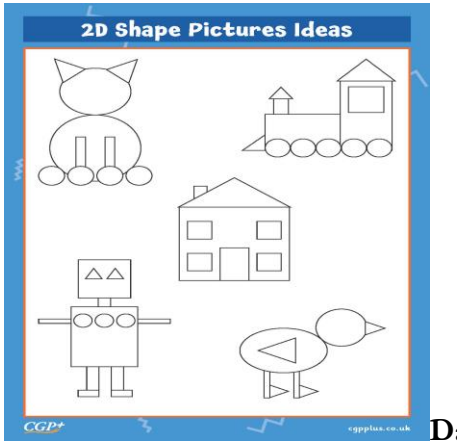
Introduction to the Subject: This area in Mathematics helps students to realise that information is all around them and it can be gathered to learn more about their surroundings. Students at this age are generally curious and should be provided with opportunities to navigate their environment to find similarities and differences, draw conclusions and make vital decisions based on their findings. This course of work allows them to question things around them to ascribe a number through counting for collected data.
Strand (Topic): Data Handling and Probability
Essential Learning Outcome 1.1: Collecting, Organising and Displaying Data - Formulating questions that can be answered with data
Grade Level Expectations: Asking simple survey questions with a couple of choices as a means of collecting data for counting situations
Key Skill/ Concept: meaningful counting, skip counting, constructing, connecting

Specific Curriculum Outcomes:	**Inclusive Assessment Strategies:**	**Inclusive Learning Strategies:**
Key Skills/Concepts: Learners will be expected to: **Knowledge** • **Construct simple questions based on observation.** • **State the information that can be collected by using a given question.**	**Observation** Listen to students as they formulate questions during the observation process based on the experiences provided by the teacher (for example: nature walk, concrete objects provided by teacher,etc.) Check to ensure that **the questions generated are related to what was observed.**	Give students opportunities to formulate and ask questions to collect data. Students can do this through playing of games, listening to stories etc. Provide opportunities for students to brainstorm about what they are interested in exploring. Invite students to ask questions about their interests. What question would they like to answer?

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **Identify sources for collecting information for data.** • **Formulate questions that can be addressed with data collected to answer them** **Skills** • **Observe objects/ people in the environment.** • **Communicate with others and among peers regarding their observations.** • **Count the number of objects/ people based on observation.** • **Justify reasons for answers** • **Make connections with numbers** **Values** • **Willingly participate in observation activities.** • **Learn to appreciate that questions that are worded differently can obtain the same answer.**	**Oral Questioning** Listen to students' answers based on the questions they construct. Check to make sure that answers supplied are related or possible. follow-up questions can be asked to check students' understanding. **Probing Questions** What would you like to know about this picture/ objects/people? **Peer Evaluation** Listen to students as they evaluate their peers as they ask questions to be used to collect data. **Jumbled Words** Conference students concerning their efforts at putting words together to form questions based on a situation (shapes, coins, pictures, sports) *Example:* (cents many are How coins jar the five in?)	Provide students with templates to create data collection tool e.g. surveys or questionnaires. What questions will they need to ask to help answer their question? Provide opportunities for students to collect and record data by observing. Students can observe peers based on the type of snack they like to eat or games they like to play. Have students use their devices to record videos of scenes/items to be observed to stimulate them to ask their peers questions.  Present students with a variety of learning experiences/situations to stimulate questions in their minds.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **Accept that information can come from multiple sources.**	**Fish for a Question** Observe as students select random questions from a fish bowl; read each question, then state which data set they would use to get the information to answer the question. Non-examples should be provided to monitor students' understanding. This is noted where questions are asked about data sets that are missing. Example: A bowl with sample questions: 1. How many bananas are in the bowl? 2. Of all the shapes, which one has the most squares? 3. Who has the least number of marbles? 4. What is the gender of the tallest child? 5. On which day were the most mangoes sold?  **Data Set A**	 Counting the different colours of vehicles that may pass around a certain time.  Counting the different colours/types of flowers found in the school yard. Teacher models the process of formulating questions relating to selected objects/situations (coins in a box, box of crayons, a garden filled with colourful flowers). Students observe the teacher as he/she models the process of asking

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Source:https://www.finewebstores.com/thumbnail.asp?file=assets/images/HFA/tropicalassortmentinironbowl_1806_general.jpg&maxx=300&maxy=0  **Data Set B** Source:https://media.gettyimages.com/id/129301897/photo/smiling-children-standing-together.jpg?s=612x612&w=gi&k=20&c=QpHWMTxSafUUnhftvZU7pv-AfltGUHi4ircqQ-FwdQc=	questions. Teacher guides students as they practise formulating questions.  **Role Play -** Teacher provides students with opportunities for students to practise asking their peers questions related to observable data in different scenarios. (e.g. TV show, interview on the street, etc.) Have students work in small groups to construct questions containing the vocabulary least, most, more than, less than, that can be answered using a given data set. Students from different groups exchange questions and give feedback to each other on the clarity of the questions

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 **Data Set C** Source:https://www.cgpplus.co.uk/getmedia/22e4c0a8-dff9-4392-bc40-b95fb45c8e1b/a01wac7734-cover Observe students match questions to possible sources where data can be had to answer these questions; and how they justify their responses. Observe students as they work in small groups to correct questions with errors to make them clearer and or more specific. **Role Play**	

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Observe students as they interview each other based on selected scenarios /learning experiences presented  to students. Students take turns to construct and ask questions according to the scenario presented.	

Useful Content Knowledge for the Teacher about the Outcome: (Links to professional sources that *connect back to the Curriculum and Assessment Principles of Learning and Principles of Assessment*)

Data refers to a collection of facts (words, numbers, measurements etc) about the things around us. The process of collecting data involves observing, asking questions(interviewing), experimenting and conducting surveys. Data that is collected can be used to make very important decisions in our daily lives.

Data collection methods:

- Observation - This is a way of gathering data by looking at events, behaviour, or noting physical characteristics/features of a person or object in its natural setting.
- Interviewing - This involves two or more people exchanging information through a series of questions about a phenomenon (event, person, object).
- Experimenting - This is a method of conducting tests to collect data about properties of objects and to identify patterns in events in our environment.
- Survey - This is a method which involves the use of a questionnaire administered to a sample (small group representing a larger group) in order to collect data.

Additional Resources and Materials: 3D shapes or 2D shapes of different colours and sizes; toys, flowers, pictures
Videos showing a short interview: How to Conduct an Interview - YouTube
Video showing data collection: Data Collection Methods | Mathematics Grade 1 | Periwinkle - YouTube

Opportunities for Subject Integration:
Mathematics - Skip counting from any number between one and twenty (forward and backward)
Science - Observing the properties of various objects/animals
S.Studies - Asking questions to collect data about objects/people in their community
L.Arts - Constructing oral questions using the 'wh' words (What , Why , Who , When , Where)
HFLE -
Creative Arts -

Strategies that Support the Curriculum and Assessment Framework

Elements that are integrated across subjects:

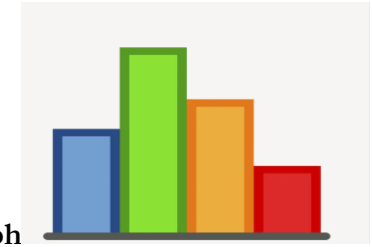
Elements from Local Culture, Technology, TVET, Environment that are integrated:

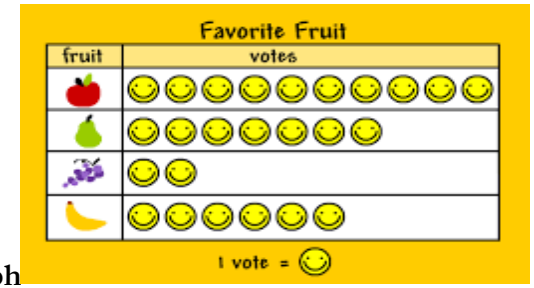
Items of Inspiration (teaching tips, inspirational passages, connections to educational research):
Story Books - The Best Vacation Ever by Stuart J. Murphy ; Charlie's Checklist by Rory S. Lerman.

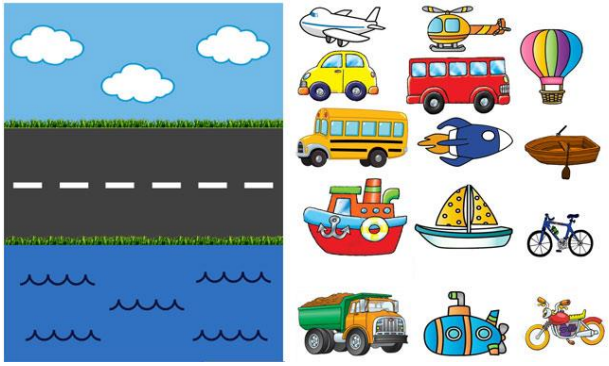
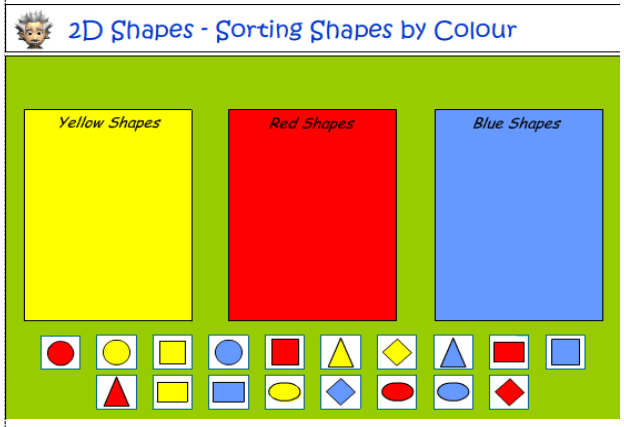
Introduction to the Subject: As students continue to work with data, they will learn how to collect data through the use of observations, experiments and interviews, and will record, sort and organise data and use different modalities to represent them. The idea is to make the information students work with as real as possible to make connections to the world around them, so they benefit from the usefulness of the data collected. They are provided with opportunities to verbalise their understanding of the materials with which they interact.
Strand (Topic): Data Handling and Probability
Essential Learning Outcome 1.2: Collecting, Organising and Displaying Data - Collecting, organising, displaying and communicating data
Grade Level Expectations: Sort sets of data about people or things according to one attribute, and describe rules used for sorting. Collect data through observations, experiments, and interviews to answer questions of interest that focus on a single piece of information; record the data using methods of their choice; Using tallies, making simple bar graphs and pictographs to represent data collected.
Key Skill/ Concept: measuring, representing, counting, problem solving, constructing, experimenting, classifying, sorting, ordering

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Learners will be expected to: **Knowledge** ● **Sort objects/ people according to one attribute (shape, colour, size, properties, ethnicity, occupation, etc.)** ● **Represent the information collected from observations /experiments/ interviews in multiple ways.** **Skills** ● **Use a variety of different methods (counting, matching, grouping, rearranging, ordering, using counters, etc.) to collect and sort data.** ● **Collect data in different ways to answer questions.** ● **Use symbols/tables/groupings to sort and organise data collected.** **Values**	**Observation** Use a checklist to assess students as they engage in collecting and recording data. Assess their ability to record data accurately using different methods. **Observation Checklist** **Name of Student:** _____ **Teacher:** _____ **Date:** _____ **Statement** ✓ Pays attention in class. Distinguish between the different items in the data set State how many of each item are in a set Record data accurately Count items correctly Orally express what is shown in the data set **Oral Questioning** Listen to students as they work in pairs and small groups to provide justification for choice of strategies used in collecting and recording data.	**Group Work** Have students work in small groups or pairs to discuss how to collect data to answer questions.  *https://newsone.com/3896715/5-ways-for-schools-and-families-to-work-together-to-better-a-childs-educational-success/* **Environment Walk** Have students explore their environment to collect and display data from a small population (e.g., objects in a bin, animals/ plants found in the school yard, students in Grade 1).

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **Appreciate the fact that different information can be derived from objects sorted.** • **Show willingness to collect, organise and display data**	Students answer questions to justify why they group objects the way they did. **Think Pair Share** Students work together to represent data collected.  *Source:https://today.brockport.edu/live/news/2042-new-program-childhood-inclusive-education-msed* ***Display information in various ways:***	 *Source:https://ceric.ca/2021/06/community-connections-foster-k-12-career-exploration/* **Item Display for observation and sorting** Provide a variety of data sets that can either be qualitative (descriptive, e.g., colour, type of pet/fruits/animals/seeds etc) or quantitative (numerical, e.g., number of pets, height, weight). (Have students sort items and organize data (eg. an assortment of shapes, leaves, seeds, images, people) based on various attributes (eg. shapes, colours, sizes, masses, etc.). Have students discuss with peers the attribute(s) used to sort items with students.

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Teachers make notes of students' creativity as they mount display boards depicting the same data in an organised manner in different ways. **Tally**  Observe students as they construct charts (such as tally charts, drawings, matching diagrams, arrow diagrams, etc.) to record the number of objects/people observed in selected places at a given time (eg. people wearing different colours, vehicle colours, vehicle brands, etc) **Individual or pair work** **Bar graph**  Students represent data collected relating to their birth months, daily temperature (temperature is continuous data is better represented in line graph), ages of their classmates etc)	 *Source:https://planningplaytime.com/wp-content/uploads/2017/10/Preschool-Sorting-Activities-for-kids-Simple-and-Fun..jpg* Example: Sort cotton balls according to the correct colour. 

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Teacher interviews students as they use concrete objects (such as square tiles, counters, grid papers, etc.) to construct bar charts for collected and or given data. **Pictograph**  Students present data based on different data (topics) (eg. birth months of students, occupations of parents, ethnicity groupings in the class/schools, tourist (yacht) sightings, preferred taste in foods, preferred festivals, modes of transportation used to travel to school etc.	Source:Sorting Game DIY | Generation Genius Example: Items found on the teacher's table. Have students compare and contrast different sorting arrangements obtained from the same data set. sort items to see how their results vary. Have students sort a pack of skittles based on their colour; they sort musical instruments based on one attribute (wind instrument, vibration, etc); they classify animals based on their body covering/ how they move (swim, fly)/ what they eat; they sort items based on their tastes (sweet, sour, bitter, etc) 

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 https://www.pinterest.com/pin/465278205255763088/	Source:https://www.eslbuzz.com/learn-english-vocabulary-through-pictures-musical-instruments/  Source:https://www.studyladder.com/games/activity/sorting-shapes-according-to-colour-and-shape-3245

Useful Content Knowledge for the Teacher about the Outcome:

Data can be collected about people and things in different ways by students. These include observations, interviews and experiments. It is important that only one attribute is dealt with at this level.

A tally chart is a type of table that is used to collect data in a quick way. It involves the use of strokes or tally marks grouped in groups of five. This makes it easier to count the frequency for each value

A pictograph uses pictures or symbols to represent quantities, objects or people. It is used when the data are discrete (non-continuous). The picture or symbols that are used must be of the same size and shape.

A bar graph is a graphical representation of information using bars that extend to different heights to depict values (vertically or horizontally).

The title shows you what you are interpreting. The vertical and horizontal lines are called axes. The horizontal line is called the **x-axis**. The vertical line going up is the **y-axis.** Both are always labelled so you know what is being shown. To interpret the data, you read the very top of the bar to see which number it reaches on the y-axis.

Inclusive Resources and Materials from Regional Specialists

Additional Resources and Materials: 3D shapes or 2D shapes of different colours, toys, flowers, pictures

Videos showing sorting objects for children: Sorting Objects and Counting for Kids | Sorting Games for Preschool & Kindergarten | Kids Academy - YouTube

Sort the Same Group Two Different Ways | Preschool and Kindergarten | Kids Academy - YouTube

Games showing sorting objects for children: Sorting Objects by Colour - Group sort (wordwall.net)

Sorting objects - Group so rt (wordwall.net)

Sorting - - Group sort (wordwall.net)
Opportunities for Subject Integration: Mathematics - Describing the properties of objects Science - Classifying objects/people based on given attributes ; Measuring the temperature S.Studies - Following oral instructions to collect data on race/ ethnic groups (height, weight) or cultural activities L.Arts - (QAR) Asking and answering questions to get meaning from the data collected and represented. HFLE - (Environmental Health) Collecting data on different plants, flowers, trees which can grow in a class/ school garden to make their environment beautiful. Creative Arts - Constructing a concrete graphing mat, 'Silent Gallery Walk'
Elements from Local Culture: Nine mornings, carnival, La Rose Festival, Blues Festival, World Creole Music Festival
Resources for a learner who is struggling: Graphing activities for kindergarten - The Measured Mom https://www.turtlediary.com/game/charts-and-graphing.html

Introduction to the Subject: In today's world students should not only be taught how to collect and sort data, therefore, the opportunity will be given to them here to order categories of data from greatest to least and vice versa. This will help pupils in finding numbers that are greater or lesser than any given number, developing their competence in number sense and counting forward and backward. The introduction of tally tables, concrete graphs and pictographs will be used here to represent data so pupils can see the different sets as they analyse accordingly.
Strand (Topic): Data Handling and Probability
Essential Learning Outcome 1.3: Using Statistical Methods to Analyze Data - Describing data sets
Grade Level Expectations: Order categories of data from greatest to least frequency for various data sets displayed in tally tables, concrete graphs, and pictographs.
Key Skill/ Concept: Representing, sequencing, counting, measuring, reasoning

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Learners will be expected to: **Knowledge** ● **Explain how and why a given data set can be arranged in different orders.** ● **State the highest and least value in each data set.** ● **Compare the values of different members of a given data set** ● **Arrange sets of data from greatest to least** **Skill** ● **Use a variety of strategies (tally charts, matching, counters, array diagrams, bar charts, etc.) to identify the count of each member of given data set.** ● **State reason(s) why identified members in a data set has a low or high frequency.** ● **Identify and speak about trends in data set presented in tables,**	**Observation** Use a checklist to assess students as they arrange items from greatest to smallest in a graph (pictograph, concrete graph, etc) **Observation Checklist** **Name of Student: _____ Teacher: _____** **Date: _____** **Statement** ✓ Pays attention in class. Demonstrates knowledge of how to arrange objects. Demonstrates knowledge of the terms greatest and least by arranging items correctly. Orally demonstrates their knowledge of the key terms 'smallest' and 'greatest'. Items are neatly organized.	

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
pictographs and or concrete bar charts. • **Represent given data on a tally or graph.** • **Arrange data according to frequency.** • **Order sets of data displayed from greatest to least using tallies, concrete graph and pictographs.** **Values** • **Appreciate the fact that the same data can be represented differently.** • **Speak freely of how different strategies used by students helps in making learning interesting.**	Observe students working in pairs, as they reflect on the work of their peers against formulated criteria; and students give suggestions for improvements. **Game** Students play a game in which they arrange themselves according to their heights (tallest to shortest).  *Source: https://familife.in/en/growth-chart-calculator-indias-children/children-height-lineup/* **Interviews and anecdotal records**	

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Make notes of and interview students concerning the strategies they used to order members of a data set. *Sample question: How did you know you arranged yourselves correctly?* *Possible students' responses: We aligned ourselves in pairs first and our classmates checked to ensure that we were lined up properly/ We picked the tallest and shortest in the group then the others fell in place in the line up.* Take notes of students as they use the feedback of their peers to identify improvements and adjust the quality of their work. **Oral Questioning** Listen to students as they justify the order for which they placed the items on their graph. Ask questions to ensure that they can distinguish between large and small numbers in data sets.	

Useful Content Knowledge for the Teacher about the Outcome:

Data can be represented or organised according to its magnitude (from smallest to greatest and/or greatest to smallest).

Students should understand the terms: greatest, largest, smallest, and least.

Inclusive Resources and Materials from Regional Specialists

Additional Resources and Materials: Videos and pictures showing festivals

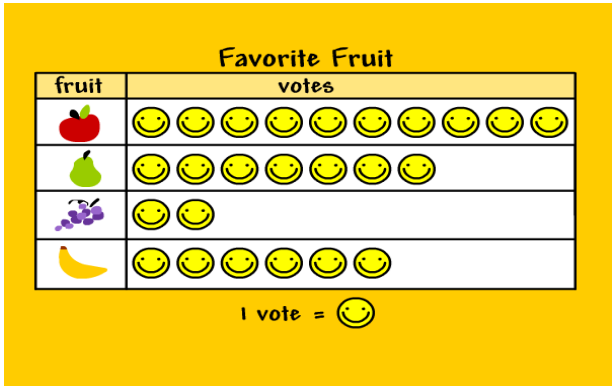
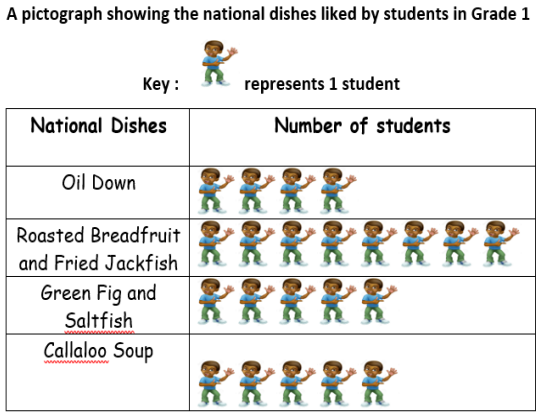
Videos showing arranging numbers from greatest to least: **ARRANGING NUMBERS FROM GREATEST TO LEAST - YouTube**

Opportunities for Subject Integration:

Mathematics - Comparing numbers/ Arranging numbers in sequence; measuring and recording the distances different students jump
Science - Planting different seeds (peas, corn, peanut, peppers, tomatoes) and ordering them based on height over a period of time.
S.Studies - Show pictures of patrons at tending different festivals in their country and order the pictures from the greatest to the smallest crowd shown.
L.Arts - Demonstrate the understanding of the words 'least' or 'greatest' by representing the information on a graph, tally, etc. For example: if a student represents their language score, another student can show a greater score.
HFLE - Discuss the food groups and place them in a frequency based on the amount brought by students.
Creative Arts - Silent Gallery Walk, Picture Wall

Elements from Local Culture:
Resources for a learner who is struggling: https://www.liveworksheets.com/au747515va
Resources for a learner who needs challenge: https://www.liveworksheets.com/zz1485278fg
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):**

Introduction to the Subject: Even though students are young, it is essential to help them understand the importance of making decisions for themselves. This section allows students to gain a deeper understanding of what they are learning and how information can be further extracted from data presented. Students must realise that they have a voice in the classroom to share their opinions and how they can listen to others to make informed decisions based on outcomes.
Strand (Topic): Data Handling and Probability
Essential Learning Outcome 1.4: Using Statistical Methods to Analyze Data - Developing and applying methods to analyse data sets
Grade Level Expectations: Analyze different sets of data presented in various ways, including in tally tables, concrete graphs, and pictographs, by asking and answering questions about the data drawing conclusions, then make convincing arguments and informed decisions.
Key Skill/ Concept: differentiating, analyzing, interpreting, reasoning, representing, problem solving

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Learners will be expected to: **Knowledge** ● **Identify that data can be represented in tally charts, tables, concrete graphs, and pictographs** ● **Read and interpret data represented in tables, pictographs and bar charts** ● **Distinguish among the different ways in which data can be represented** ● **Read and interpret data presented in various ways.** **Skills** ● **Generate and answer questions based on data presented in tally charts, concrete graphs, pictographs** ● **Use correctly vocabulary (most, least, more than, less than, etc.) when speaking about the occurrences of members in a data set**	**Oral Questioning** Listen to students; take notes of and give feedback to them as they use information from graphs, pictographs, charts and tables to answer questions. Students answer questions correctly based on the information presented in bar graphs, pictographs etc.  Source: *https://jr.brainpop.com/math/data/pictographs/* Possible questions: a. How many children prefer apples? b. Which fruit is least preferred?	**Making Connections** Use previously collected data to construct various types of graphs (tally chart, bar graph, pictograph) Compare the different representations to help students see that the data does not change. 

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
• **Draw conclusions based on the analysis of information given.** • **Analyze data to obtain essential information.** • **Interpret information from data presented in graphs, tally charts, tables, concrete charts.** **Values** • **Appreciate the importance of being able to present sets of data in multiple ways** • **Begin to accept that different students can interpret the same data in different ways.** • **Students make informed decisions based on the information received.**	c. How many more children prefer pears than bananas? **Group work** Have students work in small groups to construct questions containing the vocabulary least, most, more than, less than, that can be answered using a given data set. Students from different groups exchange questions and give feedback to each other on the clarity of the questions. Have students work in small groups to answer questions based on given pictographs, tally charts, tally charts etc. **Oral presentation** Students demonstrate their understanding of the graph through oral presentation. Make notes of students' reasoning as they match possible answers to questions based on data. Students ask each other questions about the graph shown or made. **Conferencing**	**Modelling/Think Aloud** Model questions that can be answered from given authentic data. Model strategies used to answer questions about information given in picture graphs, tables and bar charts. **Math Talk** A tally chart showing the amount of money that four friends spent at a candy store. Names of students / Amount of money spent ($) Michael / 𝍸 𝍸 𝍸 II Sita / 𝍸 𝍸 III Colin / 𝍸 𝍸 Pamela / 𝍸 III Provide students with multiple opportunities to describe and discuss data given in picture graphs, tables and bar charts, using vocabulary such as 'most', 'least', 'highest', 'lowest', 'smallest', 'same as', 'as many as' **Developing a story as a class**

Specific Curriculum Outcomes:	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Observe, conference' and point the way forward as students make use of information in tables, pictographs, charts to answer questions based on a given data set. Observe students as they re-represent data given in one into another mode of representation. For eg. pictograph to bar chart. **Individual/pair Work** Students look at a graph provided by the teacher and make a different graph displaying the same information. **Class Discussion** Discuss reasons as to what might have caused the changes in communication devices today.	Make a story using information from data from picture graphs, tables and bar charts. **Present real situations** Use data students collected and what is presented by the teacher (data charts) to ask and answer questions. Students look at the sale of food/ shoes/ favourite subject in a graph and discuss. Students talk about the number of different injuries/ accidents at school. Group/peer discussion on whatever data is presented. Students draw conclusions as to what could have caused the changes in transportation. Use all the authentic examples that students can use to make informed decisions. Having this data, ask, "What can we learn from this data?" What can we do because of what you know now?

Useful Content Knowledge for the Teacher about the Outcome:

Teachers need to know how to analyze data to help students draw conclusions.

Teachers should know how to guide students to make informed decisions. For example: Teacher leads students to the conclusion that they would need an umbrella for a rainy day.

Inclusive Resources and Materials from Regional Specialists

Additional Resources and Materials

Games to interpret graphs: Bar Graphs and Picture Graphs - Gameshow quiz (wordwall.net)

Parts of a Picture Graph - Labelled diagram (wordwall.net)

Bar Graphs and Picture Graphs - Open the box (wordwall.net)

Opportunities for Subject Integration:

Mathematics -
Science - Discuss the types of weather experienced in the Caribbean.
S.Studies - Discuss reasons why there is a change in transportation and communication devices as represented in graph. For example: Students may look at a graph showing how many people have a cell phone and a house phone.
L.Arts - Compare and contrast the different festivals.
HFLE - Analyse the impact of exercise and rest on the body.
Creative Arts - Draw the response to their decision or argument.

Elements from Local Culture: *(References that learners might know from their local environment*

Based on pictures or videos presented earlier, make a compelling argument to justify why a particular festival is the best. (Students state reasons why they would want to attend a festival, etc)

Resources for a learner who is struggling:

https://www.liveworksheets.com/worksheets/en/Math/Data/Data_mm1448664vy

Resources for a learner who needs challenge: *(Links to learning activities and resources in later grades)*

https://www.iknowit.com/lessons/b-reading-bar-graphs.html

Strategies that Support the Curriculum and Assessment Framework

Elements that are integrated across subjects:

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

Question students about how they think communication might change in the future.

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

Introduction to the Subject:
Students need to be given opportunities to develop critical thinking skills which will allow them to function well in society. Understanding probability will give students the ability to foretell or determine the outcome of events or things and make intelligent guesses about results. Teachers will present students with scenarios that will teach the understanding of given terms, such as "possible", "impossible" and "certain", in a way that they can apply this knowledge to their own daily lives to make informed decisions.

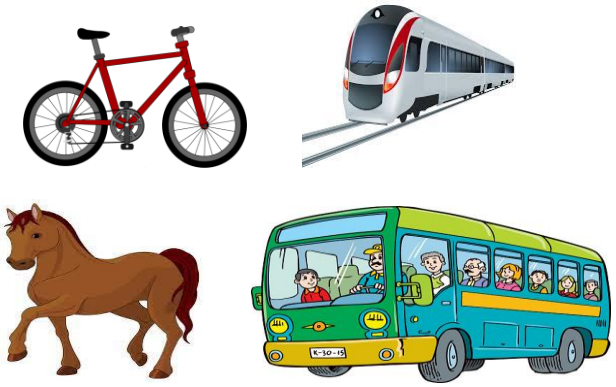
Strand (Topic): Data Handling and Probability

Essential Learning Outcome 1.5: Understanding and Applying Concepts of Probability - Predicting and describing the likelihood of an events.

Grade Level Expectations: Describe the likelihood that events will happen, and use that information to make predictions. Use mathematical language, including the terms "impossible", "possible", and "certain", to describe the likelihood of events happening, and use that likelihood to make predictions and informed decisions.

Key Skill/ Concept: Predicting, reasoning, creating

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Learners will be expected to: **Knowledge** ● **Use correctly words (vocabulary) associated with probability such as "impossible" 'will happen", (will never happen', "possible", and "certain to describe the likelihood of events occurring**	**Oral Questioning** Students make informed decisions based on outcome. Students are presented with a shopping scenario. They are given a certain amount of money and asked to answer particular questions: *What are you certain you can buy? Is it likely for you to buy two things with the amount of money you have?*	**Direct instruction to understand the meaning of these words.** Provide students with the opportunity to identify events that are possible or not possible. For example Ask students to judge various events as *certain, impossible*, or *possible* ("might happen"). ❖ It will rain tomorrow. ❖ Drop a rock in water and it will sink. ❖ A mango seed planted today will bloom tomorrow.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Skills • **Predict possible outcomes of events given.** • **Make informed decisions based on predictions and outcomes of event.** **Values** • **Appreciate the importance of learning about probability and how the knowledge of such can be applied to our daily lives and affect decisions we make.**	Every vehicle on the road has music. What is the possibility of the next vehicle passing with music? Show students types of transportation and ask questions… For example: *Which type of transportation is likely to be used in your area/country?* *Which type of transportation is unlikely in your area?*  https://creazilla.com/nodes/3151489-bicycle-clipart https://clipartpng.com/?1078,train-png-clipart	❖ The sun will rise tomorrow morning. ❖ A hurricane/tornado will hit our town. ❖ If you ask someone who the Prime Minister of SVG they will know. ❖ You will have two birthdays this year. ❖ You will be in bed by 9:00 p.m. Allow students to justify their choice of how likely they think it is. Ask students to make predictions about what they think might happen and then explore through experiments. For example, use of random devices with which students can count the outcomes, such as tossing a coin. Coloured dots can be stuck on the sides of a wooden cube to create different colour probabilities. Colour tiles (e.g., eight red and two blue) can be placed in opaque bags. Students draw a tile from the bag and then return it after each draw.). This will support students' emerging ideas about what is possible or not possible.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	https://depositphotos.com/vector-images/horse-clipart.html https://www.istockphoto.com/vector/bus-with-passengers-gm1197096697-341663967 **Games** Probability game on word wall: Probability - Quiz (wordwall.net) Probability Gr 3 - Group sort (wordwall.net) Probability (Grade 1) https://wordwall.net/resource/8106684 Students spin the wheel and give an example of the word it lands on :maths spinner probability - Random wheel (wordwall.net) Students will spin the wheel and state whether the sentence is "certain", "impossible", etc.:Probability - Random wheel	Use various pictures and calendar to depict the following: ***Certain*** - days of the week, festivals (birthday, christmas day, etc) growth in height. ***Possible*** - the weather. It will be a sunny day. **Impossible** - pigs flying, cock laying an egg, a man making a baby. A new born baby walking ***Likely*** - the weather, the teacher doing a cartwheel in class. Students pick a colour from a jar. ***Predict*** - how many puppies a dog will have, a gender of a child.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Group work Students work in groups to create a chart depicting events with outcomes that are possible, impossible and certain. They take turns to explain why the selected outcomes are placed under the headings they are placed.	Represent probability on a number line, where 0 (impossible) to 1 (certain) provides a visual representation of how likely an event can be. **Probability Sorting Activity** What's the possibility that each event will occur? **(possible , impossible , certain)** You will see a flying pig.  It will rain on Monday.  The sun will rise tomorrow.  Your teacher will do a cartwheel in class. 

Useful Content Knowledge for the Teacher about the Outcome:

Impossible - not able to happen, or be done; not possible (*Impossible | Wordsmyth Word Explorer Children's Dictionary; WILD Dictionary K-2 | Wordsmyth*, n.d.).

Possible - capable of being, happening, being done, or being used (*Possible | Wordsmyth Word Explorer Children's Dictionary; WILD Dictionary K-2 | Wordsmyth*, n.d.).

Certain - sure; positive; having no doubt *(Certain | Wordsmyth Word Explorer Children's Dictionary; WILD Dictionary K-2 | Wordsmyth, n.d.).*

Students should be able to use the above terms in sentences correctly. Students should also be able to make predictions and informed decisions by critically assessing information given to them. Teachers should demonstrate critical thinking skills for students to develop and master the skill.
Inclusive Resources and Materials from Regional Specialists
Additional Resources and Materials **Video about chance - https://www.youtube.com/watch?v=TedbpetdzBE** **Video teaching probability: Probability! | Mini Math Movies | Scratch Garden - YouTube**
Opportunities for Subject Integration: **Science** - Create a weather chart for the Caribbean displaying weather patterns that can be: impossible, possible or certain. **Social Studies** - Students state for certain what they would find at important places in their community. (church, police station, school) **Language Arts** - Make predictions from given text. **HFLE** - Use acquired life skills to respond appropriately to effective use of drugs, using words such as: certain, possible, impossible. **Creative Arts** - Create posters displaying images showing things that are: possible, impossible and certain.