December 2023

Organisation of
Eastern Caribbean States

OHCP Grade Two Mathematics Curriculum

Overview

The Specific Curriculum Outcomes (SCO) to be developed at this level are presented with due recognition of those outlined for the preceding grades. Against this backdrop, teachers are once again reminded of the need to ensure students' comfort with prerequisites, before introducing new concepts or skills. The general knowledge, skills, attitudes, and mathematical processes that should be made manifest in pupils by the end of Grade 2 are highlighted in this section under the Six content strands: -

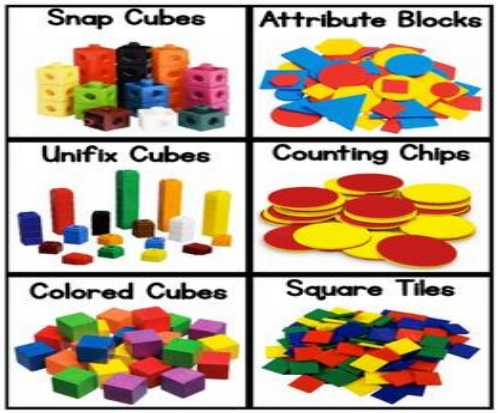
Number Sense (N); Operation with numbers (O); Patterns and Relations (PR); Geometric Thinking (G); Measurement (M), and Data Handing and Probability (D).

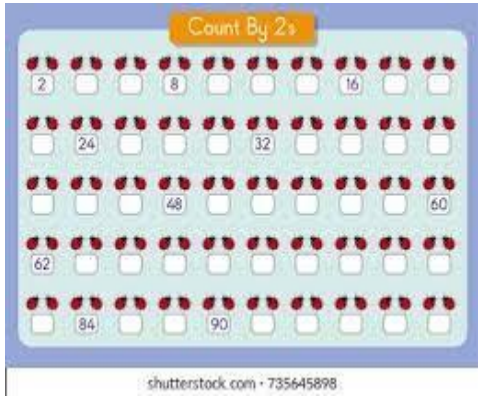
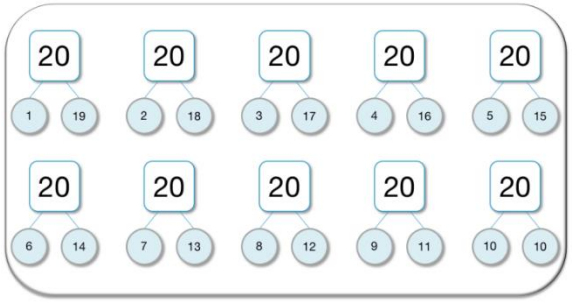
In Grade 2, instructional time should focus on six areas: (1) extending understanding of base-ten notation; (2) building fluency with addition and subtraction; (3) identifying, describing, extending, creating, and making predictions about a variety of patterns, including those found in real-life contexts (4) analyzing and classifying two-dimensional shapes as polygons or non-polygons; (5) using standard units of measure; (6) collect, organize, visualize and analyze data and use language such as impossible, possible and certain and make predictions. Please note that while every standard/topic in the grade level has not been included in this overview, all standards should be included in the instruction.

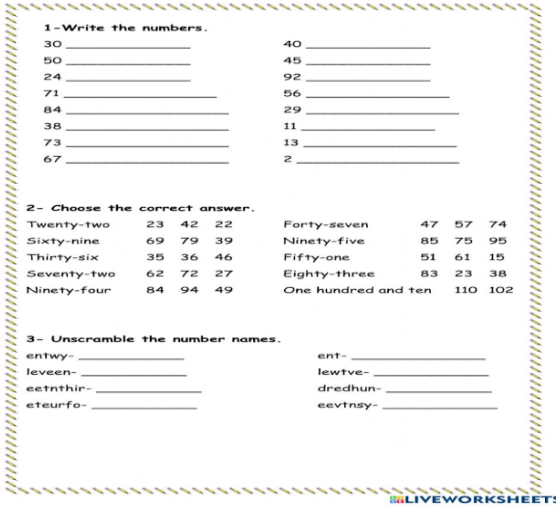
Essential Learning Outcome: Number Sense 1.1

Introduction to the Subject: "Number Sense development in young children is an important link to future mathematics achievement" (Ferguson, Mink & Witzel, 2012). It is important to constantly check for understanding as students build on their previous knowledge to make further connections and identify relationships among numbers. Number sense is fundamental to all other areas in Math and making connections to real-life issues. A good knowledge of number sense from an early age will prepare students to make critical decisions in life.
Strand (Topic): Number Sense
Essential Learning Outcomes: Essential Learning Outcome 1.1 : Whole Number - Saying Number Sequence, Meaningful Counting and Skip Counting
Grade Level Expectations: Can count with meaning to 100 by building quantities and matching quantity and numeral Can say the number sequence to 200 by 1s, 2s, 5s, and 10s Use number lines and hundreds chart to support counting & skip counting

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Learners will be expected to: **Knowledge** • Count by 1s, 2s, 5s and 10s, forward and backward, to 100. • Say number sequence by 1s, 2s, 5s and 10s, forward and backward, starting from any point, to 100.	**Observation** • *Concrete:* Check to see whether students can use manipulatives to count and build quantities up to 100.	Provide opportunities for students to experience counting in 1s, 2s, 5s and 10s, to 100 in engaging in real life situations. For example, through games, songs, and local stories. Students should begin counting initially from 1- 100 or any given number using a counting chart and number lines.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
• Read, write and represent whole numbers from 1 - 100. **Skills** • Demonstrate different ways of representing numbers from 1 - 100. • Skip count orally in 2s, 5s and 10s up to 200. • Use a variety of methods to count and skip count. **Values** • Volunteer to count/skip count up to a given number of real-life objects found in the classroom.	 Source:https://ecdn.teacherspayteachers.com/thumbitem/Math-Manipulatives-Labels-with-Visuals-2315152-1657566217/original-2315152-1.jpg • *Pictorial:* Observe students as they match pictorial representation of quantities with the correct number up to 100. • *Symbolic:* Listen to students as they call out numerals based on a representation shown of a particular quantity up to 100. Observe students write the numeral in figures and words after being shown a representation of a particular quantity up to 100. **Think, pair, share** • Have students select a card of their choice then pair with each other to match the symbolic representation of the quantity shown on their card.	 https://cdn.teachercreated.com/covers/7106.png  Source:https://i.etsystatic.com/16378156/r/il/69009a/2529300166/il_fullxfull.2529300166_3lw3.jpg Encourage students to 'build' numbers using concrete manipulatives – include the ten frames and

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 https://img.lakeshorelearning.com/is/image/OCProduction/hh396?wid=500&hei=375&fmt=pjpeg&pscan=auto&qlt=90,1&op_sharpen=0&resMode=bilin&op_usm=2,0.25,7,0  https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.shutterstock.com%2Fsearch%2Fskip-count&psig=AOvVaw0EkNSXc2AN0m3yeZHArBAk&u	beaded number lines. Explore the numbers and find the different variations using number bonds.  https://i0.wp.com/www.mathswithmum.com/wp-content/uploads/2019/09/Part-Part-Whole-Number-Bonds-to-20.png?resize=740%2C392&ssl=1 Let students represent numbers from 1-100 using concrete manipulatives (coloured tiles, counters, counting sticks, cubes, marbles, toothpicks, buttons, corks, square tiles etc.) to count and build quantities to 100 and by pictorial representation. For example, have students fill small containers with a specified number of objects. Have students create visuals to represent counting by 2s, 5s, and 10s. e.g., skip counting by 5s could be represented by pictures of each student's hand with the fingers spread apart, or counting by 2s could be represented by pictures of each student's eyes, etc. - Provide students with a number of counters (e.g. 50), and allow them to separate the

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 st=1686750195502000&source=images&cd=vfe&ved=0CBEQjRxqFwoTCJCIhqqwwP8CFQAAAAAdAAAAABAE **Observation** • Allow students to draw quantities to represent a given amount up to 100. • Listen to students as they count in sequence to 100. Source:https://files.liveworksheets.com/def_files/2022/1/31/20131113941119074 1/20131113941119074 1001.jpg	counters from the pile as they count them by groups of 2s, 5s or 10s. - Provide opportunities for students to read and write numbers from 1 - 100.

Useful Content Knowledge for the Teacher about the Outcome: Sequencing is very important in Mathematics today. The first aspect of sequencing is to find the pattern, then move on from there. Counting is very important in sequencing as you are expected to count in order to carry on the pattern. Sequencing can involve counting backward and forward, one just needs to identify and follow the pattern.

Additional Resources and Materials

Students look at a number line and answer questions: https://www.ixl.com/math/grade-2/number-lines-up-to-100

Students skip count by 2's, 5's, 10's and 100's: https://www.ixl.com/math/grade-2/count-forward-and-backward-by-twos-fives-tens-and-hundreds

Opportunities for Subject Integration:

Language Arts - Sequencing events in a story

Science - Arranging the stages in the life cycle of a butterfly

Social Studies - Creating a timeline for the different types of transportation over the years

HFLE - first Aid procedure, personal hygiene

Arts/Craft - Create a miniature numbers book. Use drawings to represent a number of items.

Elements from Local Culture: *Ring games involving counting ('one ah twenty, two ah twenty,...').*

Dog and Bone (Two students will always have the same number and are on opposite teams. One person tries to retrieve the bone in the middle (any object) before being touched by their opponent)

Resources for a learner who is struggling: *Counting from 1 - 100: Big Numbers Song | Count to 100 Song | The Singing Walrus - YouTube*

Reinforce principles of counting such as stable order, one-to-one correspondence and cardinality (which deal with the how of counting and abstraction and order-irrelevance (which deal with the what of counting).

Resources for a learner who needs challenge: *Online games: Bonds to 100 - https://wordwall.net/resource/32644914*

Number sequencing: https://wordwall.net/resource/32168938

Skip counting: Skip-count by 5s (practice) | Place value | Khan Academy

Skip counting: IXL | Adventure Man and the Counting Quest

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

The events in our lives happen in a sequence in time, but in their significance to ourselves they find their own order the continuous thread of revelation.

-Eudora Welty

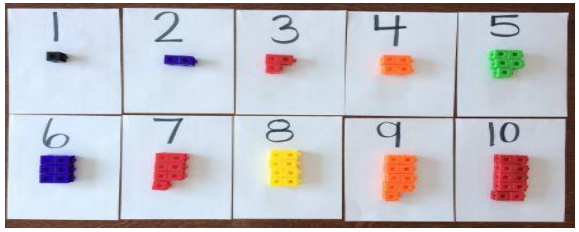
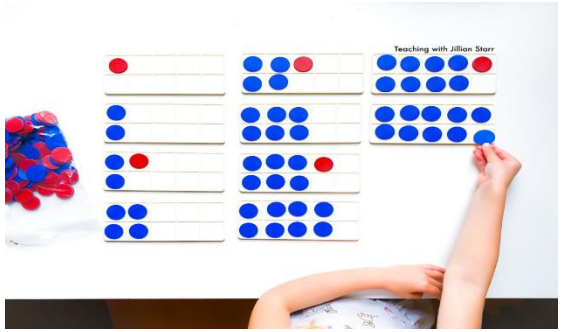
allauthor

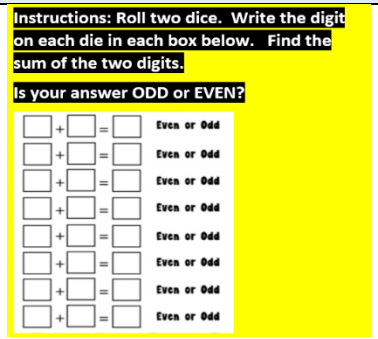
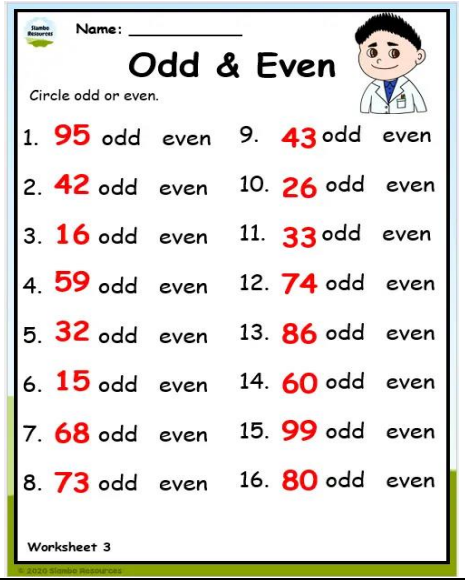
Tips on how to use a number chart with children: https://happynumbers.com/blog/how-to-use-a-number-chart-to-100/

Essential Learning Outcome Number Sense 1.2

Introduction to the Subject: Identifying even and odd numbers is an important skill that children will need throughout their Math education. This skill will help prepare them to learn division, prime numbers, composite numbers and square roots.
Strand (Topic): Number Sense
Essential Learning Outcomes: 1.2 Whole Number - Representing and Partitioning Quantities
Grade Level Expectations: Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Learners will be expected to: **Knowledge** • Distinguish between odd and even numbers for groups with up to 20 objects. • Identify equations that express an even number as a sum of two equal addends. **Skills** • Write an equation to express an even number as	**Game** Students compete in pairs or teams to differentiate among given 2-digit numbers. Each team is given response cards with the words 'odd' and 'even'. As numbers are displayed, the first pair/team that indicates the correct type of number, scores the point. The pair/team with the highest score is the winner. Students line up in teams. Two large containers (e.g. buckets) are labelled 'ODD' and 'EVEN' and placed at the front of each line. Each team is given cards with various 2 digit numbers. Team members are instructed to correctly fill each bucket with odd and even numbers. The team with the most correct answers is the winner.	Guided discovery - Identify odd and even numbers up to 20. Have students use square tiles to make equal rows and have them identify which number makes equal rows and which do not. This will help students to sort a given set of numbers as even or odd. E.g., 7 groups of 2 with one left over or 2 equal groups with one left over. Ask students to count a certain number of objects. They will then group them in twos. They will do this with different numbers and note their observations. They can look for any pattern

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
a sum of two numbers of equal value. **Values** • Willingly participate in activities involving odd and even numbers.	Students place number values on a sheet of paper to determine if they are even or odd.  Source:https://i.pinimg.com/originals/75/0c/2b/750c2bb55dad6acf023e905e58ffd244.jpg . Students will share their observations about the numbers that are odd or even based on these activities.  Source: https://jillianstarrteaching.com/odd-and-even-numbers/	in the numbers. Separate the numbers based on their observations.  Source:https://fileserver.teachstarter.com/thumbnails/7076-odd-even-numbers-poster-us-thumbnail-0-600x400.png Let children work with numbers and take out a certain number of objects and if that number is an even number, they run to the sign that says even, but if the number is an odd number, they run to the side that says odd.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 **Worksheet :** Students identify odd and even numbers. 	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	https://i0.wp.com/slamboresources.com/wp-content/uploads/2021/12/Grade-1-Odd-Even-Worksheet-3-Image.png?fit=502%2C719&ssl=1	

Useful Content Knowledge for the Teacher about the Outcome: Two types of numbers are odd and even. Odd numbers are those when divided by two have a remainder of one while even numbers are those numbers that can be divided exactly in two. Odd numbers end with 1, 3, 5, 7 and 9. For example: 21, 43, 25 , 57 , 69, etc.

Even numbers are those that can be divided equally by two. Even numbers end with the digits: 0, 2, 4, 6, and 8. For example, 16, 32, 54, 90, 96, 78, etc.

Even numbers are a subset of Integers and not natural numbers. Zero is an even number and can be represented as two sets of nothing.

An even sum can only be arrived at by adding two even addends, or any two odd addends (e.g. 2 + 4 = 6 ; 3 + 5 = 8).

Inclusive Resources and Materials from Regional Specialists

Additional Resources and Materials

YouTube video on Odd and Even numbers: https://www.youtube.com/watch?v=oesINcpSuZc

Educational Games: https://www.ixl.com/math/grade-2/skip-counting-sequences

Odd and Even numbers: https://wordwall.net/resource/9424989

Skip counting: https://www.ixl.com/math/grade-2/skip-counting-puzzles

Opportunities for Subject Integration:

Math - Count items that are usually packaged to determine if they contain a number of items that is odd or even. For example, eggs in an egg carton, packs of pens or pencils, a pack of gummy bears, pages in a book.

Language Arts - Read the story Even Steven and Odd Todd by Kathryn Cristaldi. Looking at the different meanings of 'odd' and 'even' outside of Mathematics.

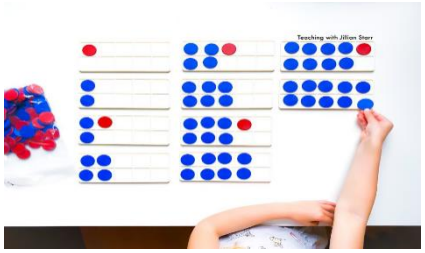
Science - Identify parts of the body that are odd and even. (Even: eyes, ears, kidneys, all toes, fingers etc. Odd: nose, heart, stomach, toes on one feet, fingers on one hand).

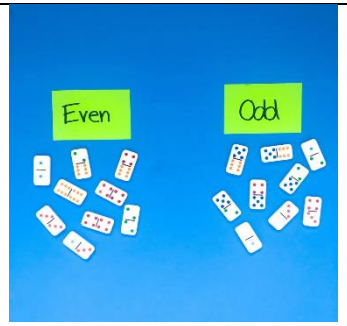
Arts/Craft - Learners create/design a chart to demonstrate their understanding of odd and even numbers; learners create a model of an object in which they use odd/even numbers of objects, e.g. 4 match sticks, 6 circles, 8 straws.

Elements from Local Culture: Game: "Who stole the cookie from the cookie jar?" The game builds mental concentration of the numbers that are still in the game and what type of number they are (Odd or Even). Whenever a learner is out, the other learners must determine whether to place that individual in the group labelled 'Odd numbers' or 'Even numbers'.

Resources for a learner who is struggling: Online Games: Count the items to determine if the number is odd or even
- https://www.ixl.com/math/grade-2/even-or-odd-number-of-shapes-up-to-20

Manipulatives - Counters, blocks, balls, dice, dominoes etc.





Source: https://jillianstarrteaching.com/odd-and-even-numbers/ Counters)

Source: https://www.elephango.com/index.cfm/pg/k12learning/lcid/11790/Even_and_Odd_Numbers (Dice)

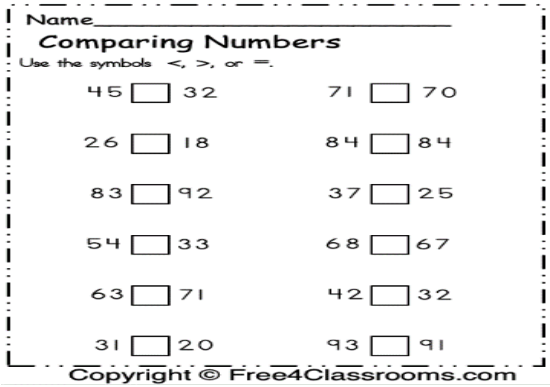
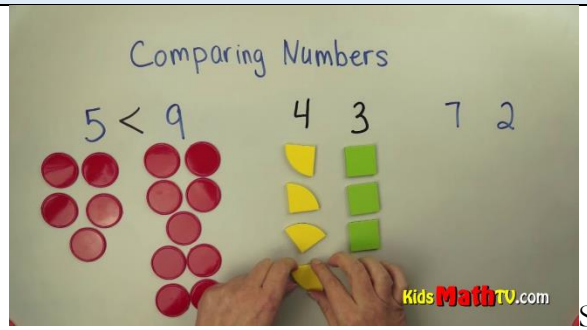
Source: https://www.theaverageteacher.com/math-games-with-dominoes/ (Dominoes)

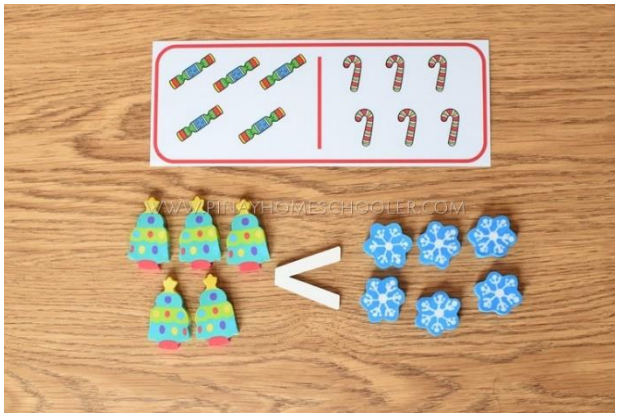
Resources for a learner who needs challenge: Online Game: Write the odd or even number that comes next - https://www.ixl.com/math/grade-2/which-even-or-odd-number-comes-before-or-after

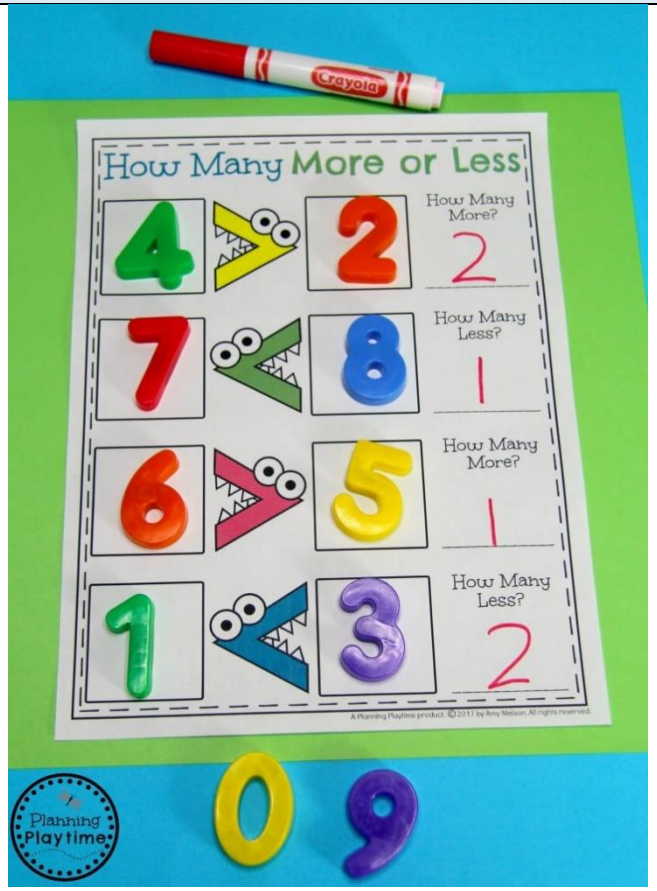
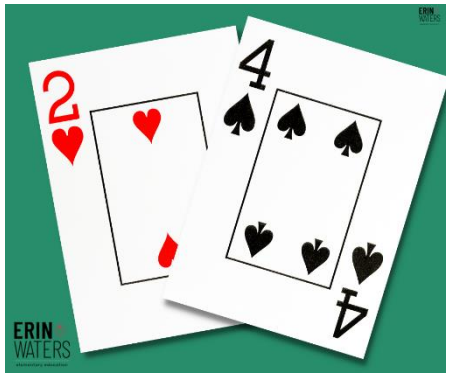
Essential Learning Outcome: Number Sense 1.3

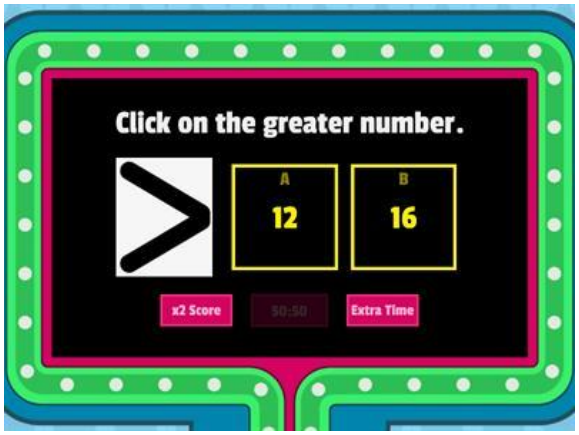
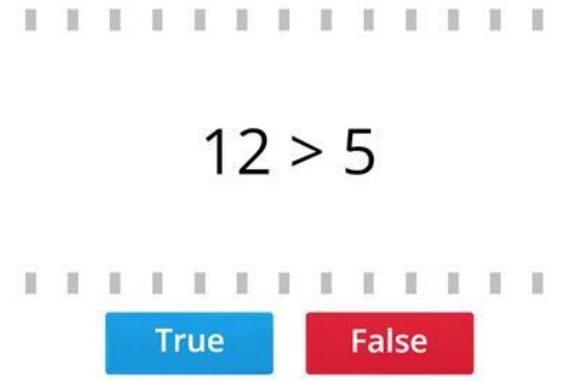
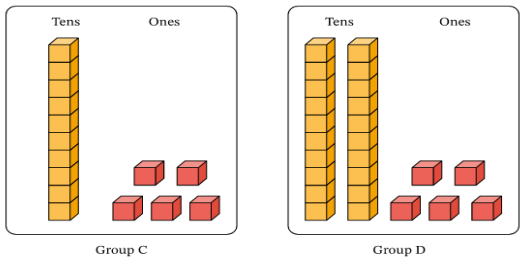
Introduction to the Subject: As children grow and get older their sense of whole numbers become wider, hence the need to introduce them to bigger numbers and the value of each digit. Pupils must be made aware of the value of each digit and how to compare each number using various signs. Exposing children to the different strategies of comparing or ordering two-digit numbers will be beneficial to them as they become fluent in their use and as a prerequisite for the higher grade levels.
Strand (Topic): Number Sense
Essential Learning Outcomes: 1.3 Whole Number - Comparing and ordering quantities
Grade Level Expectations: Compare two two-digit numbers using a variety of strategies (including place value based on meanings of the tens, and ones digits); Use >, =, and < symbols to record the results of comparisons Apply strategies to contextual situations and create story problems involving the comparison of whole numbers.

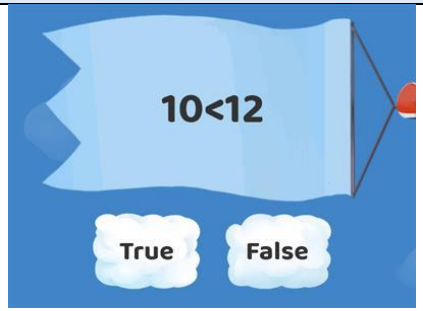
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Learners will be expected to: **Knowledge** • Compare and order numbers up to 100 in ascending or descending order. • Indicate and describe the position of specific	***Worksheet***	**Using concrete materials** **Provide opportunity for** students to use concrete objects to compare pairs of numbers, using the symbols < , >, and = to compare numbers or using terms such as 'more than', 'less than' or 'the same as'

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
numbers in a sequence by using ordinal numbers up to tenth. • Identify 2-digit numbers. • Use vocabulary related to comparing numbers (greater than, less than, equal to). • Distinguish among the symbols (< , >, and =) used to compare 2-digit numbers. **Skills** • Arrange numbers in order of size and give reasons for their arrangement. • Use relevant vocabulary to orally compare numbers (greater than, less than, equal to). • Compare pairs of 2-digit numbers using the symbols (<, > and =).	*Students will complete a worksheet on comparing numbers using the symbols (< , >, =)*  Name_____ Comparing Numbers Use the symbols <, >, or =. 45 ☐ 32 71 ☐ 70 26 ☐ 18 84 ☐ 84 83 ☐ 92 37 ☐ 25 54 ☐ 33 68 ☐ 67 63 ☐ 71 42 ☐ 32 31 ☐ 20 93 ☐ 91 Copyright © Free4Classrooms.com *Source:* https://free4classrooms.com/free-comparing-numbers-worksheets-2-digit-numbers-3/ ***Observation***	 Source: https://i.ytimg.com/vi/h7QdjjxTlHQ/maxresdefault.jpg **Games** - **Have** students play a game by grabbing items and comparing to see who has more. Let students use comparative language to describe a given number (e.g., thirty-six is four less than forty or forty is four more than thirty-six). Also, allow them to arrange sets of numbers in order, beginning from the smallest or vice versa. - - Through play have students observe and talk about positions in line-ups. E.g. Who is third? If there are 6 people in front of you, where are you in the line? If I move an individual two spaces forward or backward, what is my new position? - Provide students with opportunities to arrange numbers, pictures, etc. in a specific order then name

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Values • Show willingness to participate in games and other activities involving comparing numbers. • Volunteer to share on how to compare pairs of numbers.	Observe students as they use concrete materials to represent given quantities in order to compare 2-digit numbers. Listen as students compare numbers using related vocabulary.  https://lh3.googleusercontent.com/-WyM_3akFAto/WiclsncICuI/AAAAAAAABt0/9GV-VdSAFWYOeLczrC83oTYB9XmxGyI6wCHMYCw/DSC_0610_thumb?imgmax=800 ***Think Pair Share*** Students work in pairs to complete a worksheet by placing the correct number in each box.	the position of each. E.g. Which number is first, second or last? - Use daily routines to reinforce comparing and ordering. E.g. The first group to finish a task, the last person in the line, etc. Source:https://www.akteacherlife.com/wp-content/uploads/2018/09/grabcountcompare-1024x1024.png Play games to compare numbers using the symbols : < or >. **Math stories** Use stories to enable students to understand the difference among the concepts of less than, more than, and equal to. Example: ***Last Monday, Jack, Jill and Billy went to a farm to pick sapodillas. Jack picked 25, Jill picked 40 and Billy picked 25 sapodillas.*** a. Who picked more sapodillas? Jill or Billy? b. Which statement is true? 40 < 25 40 > 25 25 = 40

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 *https://planningplaytime.com/wp-content/uploads/2017/10/Greater-than-Less-Than-Comparing-Numbers-Activities-for-Kindergarten.jpg*	c. Which two friends picked the same number of sapodillas? https://wordwall.net/resource/36214527 Students play a game of cards. Teacher deals the cards and students will put down cards not knowing the value. Students will see which card is bigger after putting them down. The person with the bigger/higher value card gets to keep both cards.  Source:https://elementaryedu.com/wp-content/uploads/2022/07/Comparing-Numbers-Games-2-1.png

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Online game  https://wordwall.net/resource/48323381  	Provide the opportunity for students to compare pairs of numbers using tens and one base blocks. Students will use blocks to represent numbers then compare them using the terms and symbols associated with less than, more than, and equal to. For example:  15 is less than 25 Source: https://www.nagwa.com/en/worksheets/697151562636/

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 https://wordwall.net/resource/37166546	

Useful Content Knowledge for the Teacher about the Outcome: We compare numbers by their value - the bigger the value the greater the number. Values that are the same, we use the equal sign to show their relationship. Once the values are not the same then we compare by using the symbol of the alligator where the mouth is always open to the larger quantity. It is only one sign that can be read backward or forward to change the meaning of the sign, for example, 12 < 34 can be read forward as 12 is less than 34 or backward 34 is more than 12.

Inclusive Resources and Materials from Regional Specialists

Additional Resources and Materials

YouTube video on comparing numbers: https://www.youtube.com/watch?v=g6f7RFLRVGk

Worksheet on comparing 2-digit numbers: https://www.nagwa.com/en/worksheets/697151562636/1/

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

Math - Comparing objects based on various properties (length, mass, temperature , monetary value etc.).

Language Arts - Using relevant vocabulary in their oral and written expression to compare objects.

Science - Comparing the weights of students/Comparing the lengths of objects.

Social Studies - scale drawing comparing the scale of each key and the size of each island as a whole or area of the country.

Art/Craft - Using items in the environment (bottle caps, toothpicks, tongue depressors etc.) to create models/charts to depict how to compare 2-digit numbers

Resources for a learner who is struggling: YouTube video teaching comparing numbers: Number Gators Story For Kids | Math For All - YouTube

Online Games: Put numbers in order from least to greatest - https://www.ixl.com/math/grade-2/put-numbers-up-to-100-in-order

Resources for a learner who needs challenge:

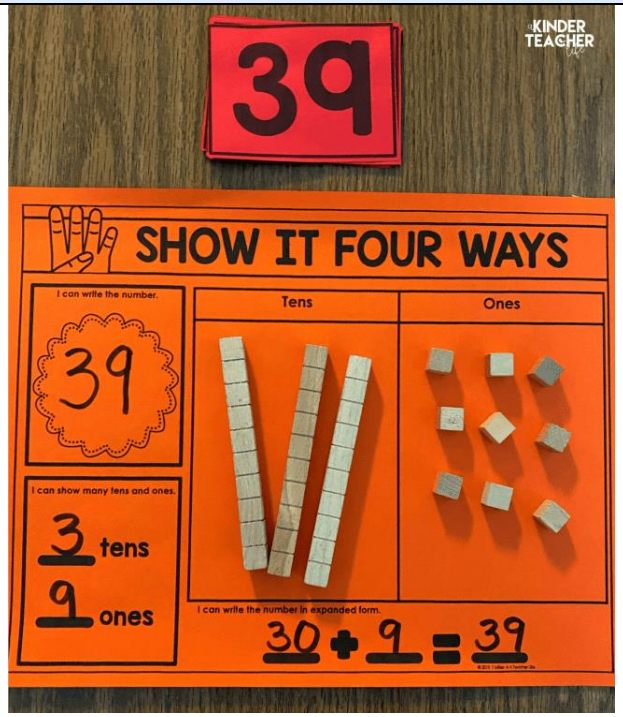
Online Games: Comparing numbers - https://www.ixl.com/math/grade-2/comparing-numbers-up-to-100

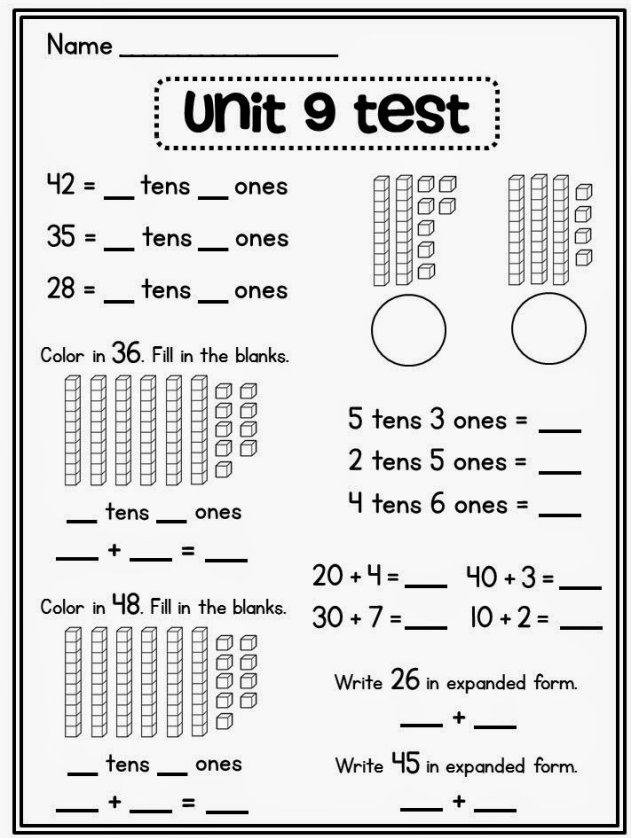
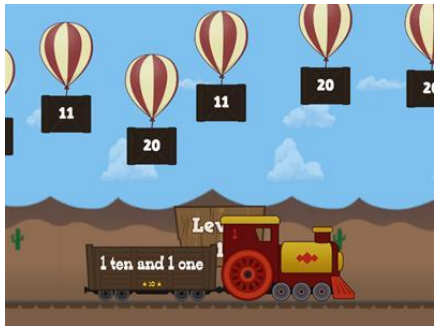
Sequencing numbers: https://www.ixl.com/math/grade-2/put-numbers-up-to-100-in-order

Essential Learning Outcome: Number Sense 1.4

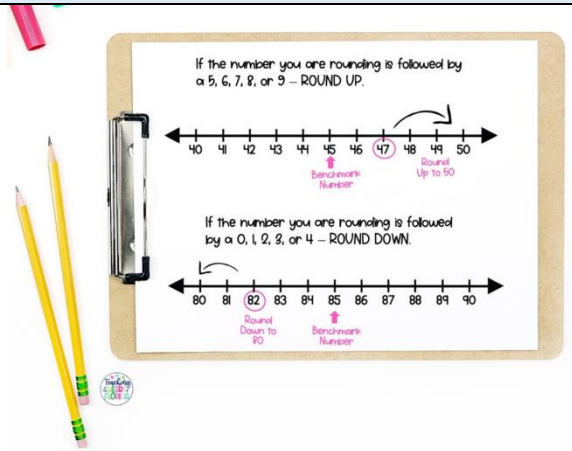
Introduction to the subject: Place value is one of the key concepts in mathematics. Place value encompasses not only position and value of digits but also decomposition of numbers and a number's relationship to other numbers. Hence understanding place value (or not understanding it) will follow students through their mathematics journey. Without this understanding, students often struggle with regrouping, adding and subtracting multi-digit numbers, and more difficult computation. It is important that children understand that while a digit can be the same, its value depends on where it is in the number.
Strand (Topic): Number Sense
Essential Learning Outcomes: 1.4 Whole Number - Place Value
Grade Level Expectations: Use place value understanding to round whole numbers to the nearest 10.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Learners will be expected to: **Knowledge** • Identify and contrast among the face value, place value, and total value of the digits in any two-digit number. **Skills**	**Observation** Students are given a number and asked to demonstrate the number 4 ways. Students will explain their work. (learners can make poems, stories, drawings, role play to represent the number).	**Use explicit Teaching** Model writing number in expanded form and read it in words. Use guided questions for students to discover that the digits of a number express the values of their own when the number is given in expanded form and read in words. Hence, the value of a digit when expressed in expanded form of the number is called its place value in the number.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
• Represent numbers concretely and pictorially up to ninety-nine (99) as groups of tens and ones. • Write the place value and total value of any digit in a 2-digit number. • Round two-digit numbers to the nearest 10 **Values** • Willingly participate in games and other activities involving face value, place value, and total value of digits in 2-digit numbers. • Appreciate the importance of knowing the place value and total value of digits.	 https://www.weareteachers.com/wp-content/uploads/place-value-activities-show-it-four-ways.png Students complete worksheets.	Provide opportunities for students to demonstrate that Place Value of a Digit = Digit × Position of digit. Use stories and games for students to distinguish between face value and place value. Use guided questions for students to discover that the face value of a digit is the digit itself, at whatever place it may be. The face value of a digit never changes. It is unchangeable and definite. But place value changes according to the digit's place. Allow students to use base ten blocks to understand the value of numbers.  Source:https://guidedmath.expert/wp-content/uploads/2016/07/guided-math-second-grade-place-value-hands-on-activity-picture-1.jpg Students play games selecting the correct number based on the place values given. Using the game helps to vary the strategy which is necessary to help students in the class who do

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 https://i.pinimg.com/736x/ea/94/ac/ea94ac69df445dcaa6616a35c94b6bed--place-value-worksheets-place-value-activities.jpg	not learn in the same way. It helps to keep the students engaged and on the concept being taught. This helps students to focus on the position of the numbers so that if 1 ten and 3 ones is shown students should not select 31.  https://wordwall.net/resource/4919699  https://wordwall.net/resource/33650708

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Projects Students create crafts demonstrating place value of numbers.  https://i.pinimg.com/736x/1a/b8/ae/1ab8ae9ed00f8c741eac99268b2e465f--place-value-centers-place-value-activities.jpg	Rounding to the nearest 10 Have Students look at a number chart to determine any number that is close to the next. For example, students will look at the numbers that are closest to 5 and then 10. They are likely to say 4 and 6 and 9 and 11 respectively. Other random numbers can be used. Students can then identify four numbers instead of two that are closest to a given number. This reinforces closest or nearest. To focus students more on multiples of 10, individual rows can be extracted from the number chart and represented as a number line. Students must understand that it is the same thing as the counting numbers but they are now on a line. Students will be given examples later where the middle poses a problem of not showing exactly where it is closest. Here the teacher will guide students to go for the higher multiple of 10. Emphasis must be placed on students' counting ability in 10's. Using the number line

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 https://teachingintheheartoffflorida.com/wp-content/uploads/2023/04/why-so-rounding-numbers-to-the-nearest-ten-and-hundred-so-hard-5-1536x1532.jpg **Questioning/Group activity** You are having a party and there will be twenty-six people there. You need to get enough plates to serve the food. Plates are usually sold in 10s. How many packs of plates might you have to buy?	 https://teachingintheheartoffflorida.com/wp-content/uploads/2023/04/why-so-rounding-numbers-to-the-nearest-ten-and-hundred-so-hard-4-1536x1532.jpg

Useful Content Knowledge for the Teacher about the Outcome: Place value tells the position or location of the digit, simply, which place is the digit. Face value: what you can see, the face value is just the digit you see and the total value tells the worth of each digit.

For example: 7 9 face value of the 7 is 7, the place value is ten's and the total value is (ace x place) 7x10 which is 70

Additional Resources and Materials: Place value song Place Value Song For Kids | Ones, Tens, & Hundreds | 1st - 3rd Grade - YouTube

Teaching Place Value: Place Value First Grade - Tens and Ones - YouTube

Opportunities for Subject Integration:

Math - Include the concept of money and how close the cost of items come to a multiple of ten cents.

Language Arts - look at the different meanings of the words rounding and value.

Science - Rounding after measuring the height of plants during germination.

Social Studies - Celebrating a birthday - Whose birthday is the closest?

HFLE - Roles in a group or family and how respect should be shown based on a person's position. (Connecting let's say the number 12, even though 2 is bigger than 1, one has a greater role or value than the 2. Someone shorter than you can be in charge, and you show respect for that person)

Elements from Local Culture: The number of years carnival has taken place compared to the number of years of independence.

The number of participants at different carnival events like calypso semi final and finals, soca monarch and other festivals.

Resources for a learner who is struggling: Online Games: Place Value (tens & ones) - https://www.ixl.com/math/grade-2/place-value-models-tens-and-ones

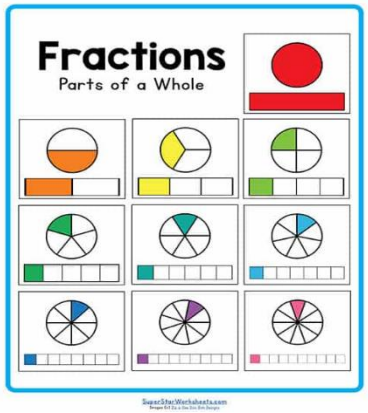
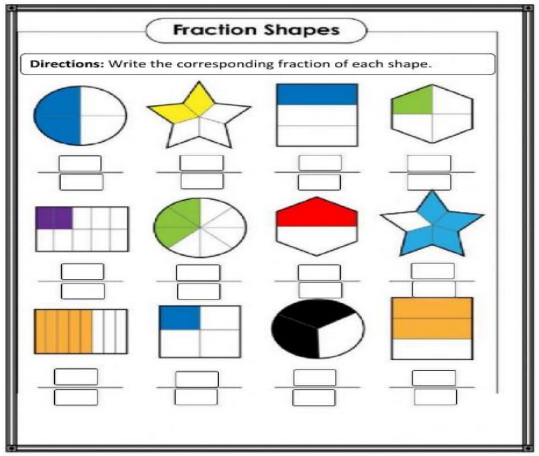
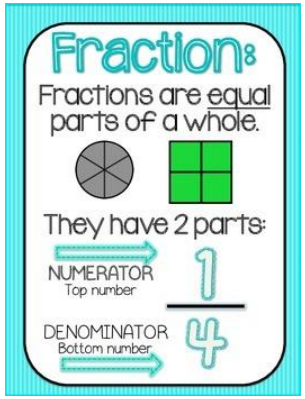
Resources for a learner who needs challenge: Online Games: https://www.ixl.com/math/grade-2/place-value-up-to-hundreds

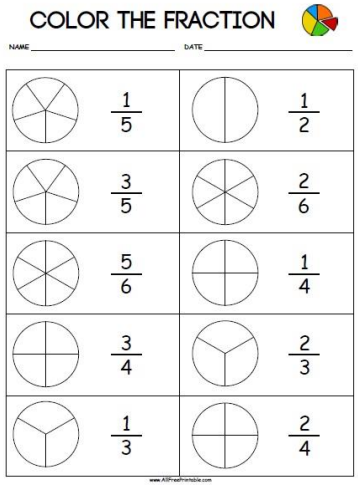
https://www.classace.io/learn/math/2ndgrade/rounding-to-the-nearest-ten

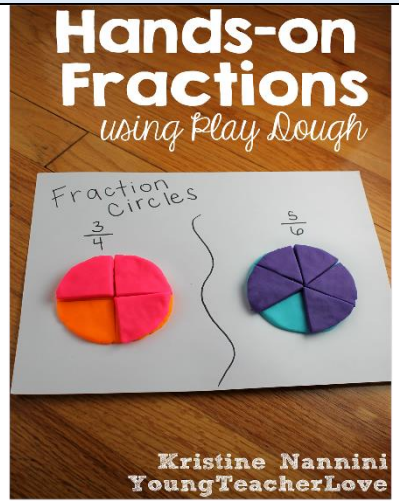
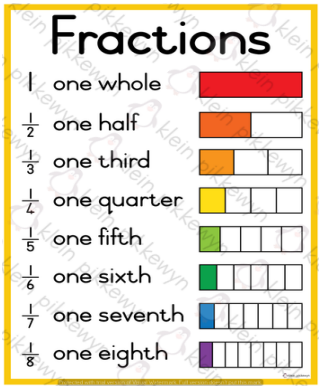
Essential Learning Outcome: Number Sense 2.1

Introduction to the Subject: Fractions are a central part of our life; we constantly use fractions in our daily activities without knowing it. There are many opportunities for students to see and understand fractions - for example, cooking and sharing. Learning and understanding fractions provides a building block for other math skills that students will have to learn. Students are expected to divide shapes into equal parts creating: halves, thirds and quarters. They should also use the fraction's names correctly while describing them.
Strand (Topic): Number Sense
Essential Learning Outcomes: 2.1 Fractions, Decimals and Rational Numbers - Representing Fraction
Grade Level Expectations: Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a part of size 1/b; partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.

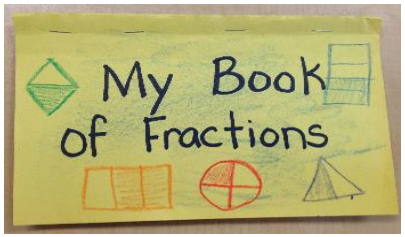
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Learners will be expected to: **Knowledge** Recognize simple fractions as representation of the parts of a whole. 1. Identify unit fractions correctly.	**Worksheet** Write the fraction that is shaded:	Have students identify and partition whole objects. E.g. Cut fruits, divide shapes, or separate the people in a group/class, paper folding etc. Allows students to experience, concretely and pictorially for example using pattern blocks or square tiles, that one-half is actually one out of two equal parts and one -fourth is actually one out of four equal parts.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
2. Distinguish between the numerator and the denominator. **Skills** 1. Partition given shapes into parts with equal sections. 2. Shade parts of given shapes to represent named unit fractions up to eighths. **Values** 1. Willingly collaborate with classmates in activities involving identifying fractions. 2. Choose to explain the use of fractions in their everyday lives.	 Source: https://superstarworksheets.com/math-worksheets/fractions-worksheets/ 	Provide opportunities for students to represent fractional parts of a whole, particularly ½ and ¼, using concrete materials such as pattern blocks or square tiles and diagrams. Have students folding strips of paper and other geometric shapes into two and four equal parts respectively. Allow students to shade one out of two parts and name it one half, and one out of four parts and name it one quarter.  Source: https://ecdn.teacherspayteachers.com/thumbitem/Fraction-Poster-FREEBIE-1223841-1398921970/original-1223841-1.jpg

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Source: https://www.liveworksheets.com/ho2710777ui Shade each shape according to the fraction given.  **Using manipulatives** • Use playdough or items in the environment to show fractions. Students will explain what each fraction is showing. For example: Students will state what fraction the blue represents in the picture and what the purple part represents in each picture.	Provide opportunities for students to recognize and name one half of a whole which is divided into 2 equal parts. Students will also have the chance to identify and name one quarter of a whole which is divided into 4 equal parts. **Using manipulatives** Provide students with playdough or paper. Have them use it to show different unit fractions.  Source:https://terrificteachingtactics.com/wp-content/uploads/2021/06/Miss-Giraffe-1024x989.png

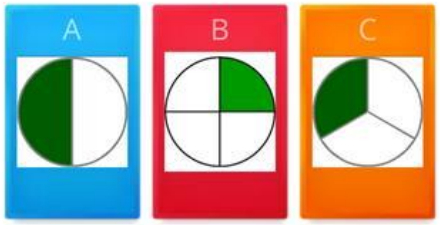
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 Source: https://i.pinimg.com/originals/55/0a/7b/550a7ba128202b2b19051275fc371511.png ***Oral Questioning*** Question students about halves of different sized objects or liquid amounts. Students are encouraged to share their observations.  	Using a fraction chart, students will compare and order fractions. They will state their observations about the size in comparison to other factional parts.  Source:https://www.teacharesources.com/wp-content/uploads/2020/06/11634-M-WHITE-Fractions-Fractionnamepicture.png Students look at a read aloud about fractions to help connect fraction to real life situations. 

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Source: (Orange halves) https://www.colourbox.com/image/half-orange-image-3096201 Source: (Breadfruit halves) https://aidaskitchenboricua.com/how-to-peel-and-cut-a-breadfruit/  Source: (Water bottle) https://www.shutterstock.com/search/water-bottle-half-full Source: (Drinking glass) https://www.alamy.com/stock-photo-glass-of-water-half-empty-isolated-on-white-background-27575407.html **Project**	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Have students create a book/flower fraction using pictures or objects in their environment to depict unit fractions.  Source: http://first-grade-friends.blogspot.com/2012/04/fabulous-fractions.html  Source: https://teachbesideme.com/fraction-flowers/	

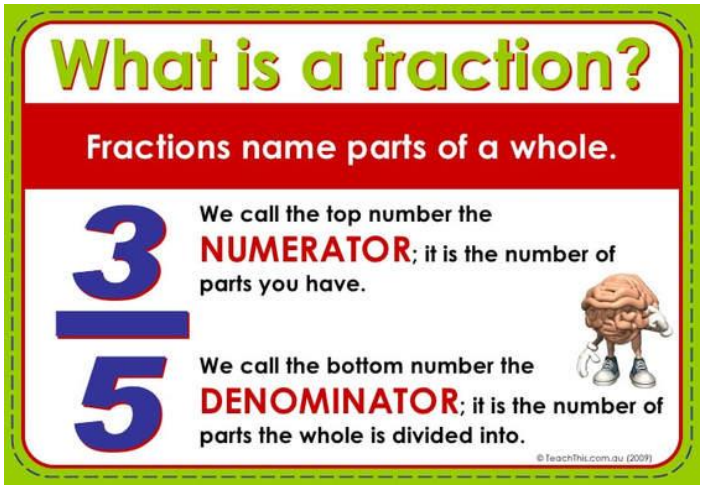
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Students create a video making juice showing different fractions (students are expected to say the fractional parts they are using in the process of making the juice).  Source: https://i.ytimg.com/vi/3KB_ziBiSgw/maxresdefault.jpg	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Students make a sandwich and cut it in halves or quarters to share.  Source:https://innerchildfun.com/wp-content/uploads/2014/05/yummy-sandwich-making-for-kids.jpg Students should recognize the fraction that is shaded.	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 ☐ two sevenths ☐ one third ☐ three fifths ☐ three quarters ☐ five eighths ☐ half ☐ one quarter https://wordwall.net/resource/9752357 Which of these shows 1/3?  https://wordwall.net/resource/46509	

Useful Content Knowledge for the Teacher about the Outcome:

A fraction is a part of a whole. Students should be able to know when an item is no longer whole; it is a fraction. Fractions are given names according to the number of equal pieces the whole is divided into. A whole that is divided into four (4) equal parts, each part is called a quarter while if it is divided into two (2) equal parts each part is called half. Students should be able to partition circles, squares and rectangles into halves, thirds and quarters.



https://amitymath1.weebly.com/uploads/1/1/9/9/119951240/published/displays-fractions-1-728.jpg?1529694911

Inclusive Resources and Materials from Regional Specialists

Additional Resources and Materials:

Videos teaching fractions: https://www.youtube.com/watch?v=362JVVvgYPE

Opportunities for Subject Integration:

Math - Telling time using the concepts of half and quarter.

Language Arts - Spelling words associated with fractions (half , whole , quarter , third).

Science - Collecting resources to conduct experiments e.g. in mixing solutions students can do measurements such as halves and quarters cup, spoon, teaspoon, litre etc.

Social Studies - Based on the composition of families of learners, they can determine which family is half or quarter the size of another.

HFLE - Discussing with students the consequences of carrying out tasks half or quarter of the way.

Art/Craft - Creating fraction models or unit fraction charts using various materials.

Elements from Local Culture:

Paying half the price of a carnival costume (What does this mean?)

Meeting someone 'halfway' (Half of a distance)

Identifying the halves/quarters in a game (half time, first quarter of a game)

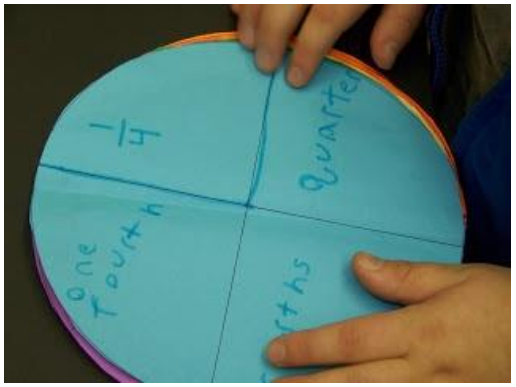
Resources for a learner who is struggling: Online Games: Identifying halves - https://www.ixl.com/math/grade-2/identify-halves

Resources for a learner who needs a challenge: Online Games: Identify the fractions - https://www.ixl.com/math/grade-2/identify-the-fraction

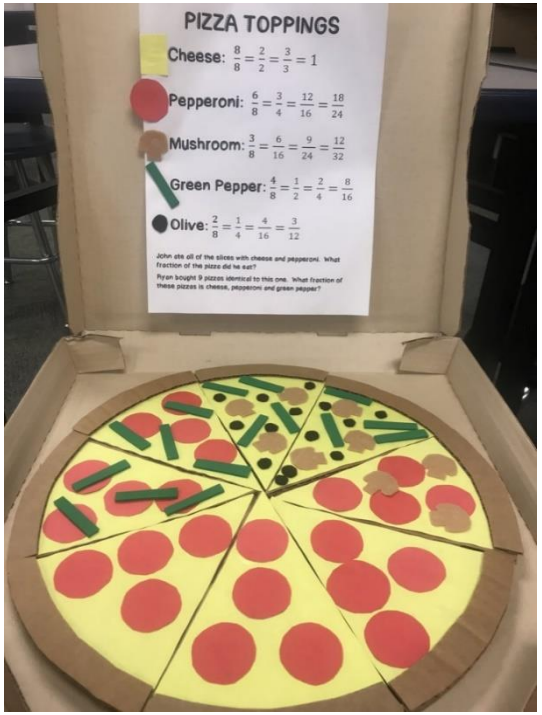
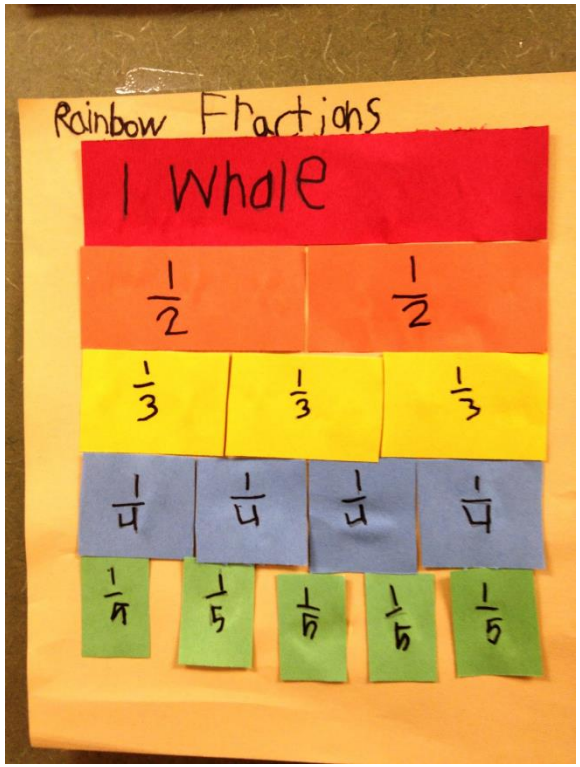
Create the fraction given: https://www.ixl.com/math/grade-2/make-halves-thirds-and-fourths-in-different-ways

Essential Learning Outcome: Number Sense 2.2

Introduction to the Subject: Fractions are a central part of our life; we constantly use fractions in our daily activities without knowing it. There are many opportunities for students to see and understand fractions - for example, cooking and sharing. Learning and understanding fractions provides a building block for other math skills that students will have to learn. Students are expected to divide shapes into equal parts creating: halves, thirds and quarters. They should also use the fractions names correctly while describing them.
Strand (Topic): Number Sense
Essential Learning Outcomes: 2.2 : Fractions, Decimals and Rational Numbers - Comparing and Ordering Fractions
Grade Level Expectations: Compare two fractions with the same denominator (limited to halves and quarters) by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or < and justify the conclusions e.g., by using a visual fraction model.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Knowledge 1. Read and write the fractions ½ and ¼ correctly as 'one half' and 'one quarter' (Not 'one over two' and 'one over four'). **Skills** 1. Compare two fractions with the same denominator (limited to halves and quarters) referring to the same whole. 2. Order fractions with the same denominator (halves and quarters). **Values** 1. Express ways they use fractions on a daily basis. 2. Show enthusiasm dividing items in fractions to share with a friend.	Students create fractions given to them from playdough or paper and write the correct name of fractional parts in digits and words.  Source:https://i.pinimg.com/736x/b4/dd/b7/b4ddb75020a51d0b7ab491207f9498a0--teaching-fractions-math-fractions.jpg ***Project*** Students create art projects to demonstrate fractions. Fractions hat  	Guide students in writing the numeral for one half as $\frac{1}{2}$ and one quarter as $\frac{1}{4}$ Provide students with opportunities to identify the numerator and denominator of fractions given to them. Model reading fractions correctly. Provide opportunities for student to compare fractions using >,<, =. For example, students can use playdough to create creations and compare their sizes physically. 

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	https://i.ytimg.com/vi/rdiyH1cyLUE/maxresdefault.jpg *Fraction Flowers*  Source:https://i.pinimg.com/736x/cd/34/48/cd3448be7b29c1c85217d283821583c7--math-fractions-maths-ks.jpg Oral Presentation Students create a model pizza and use fractions to show the toppings used on the pizza. Students will orally explain the type of pizza they made and state the fraction of ingredients used for the toppings. Students will state what faction of the toppings is the biggest and/or smallest.	Source:https://frugalfun4boys.com/wp-content/uploads/2022/08/Fraction-Activities-9-1.jpg Another example, students can engage in folding and cutting paper to create and compare fractions.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 *https://4thgradepizzaproject.weebly.com/uploads/1/1/6/9/116983123/image1_1_orig.jpeg*	 Source:https://3.bp.blogspot.com/-asTkCjBHjF8/T4ixovvJdQI/AAAAAAAADrE/Ot6E9MRUMDM/s1600/027.JPG

Useful Content Knowledge for the Teacher about the Outcome: A fraction is a part of a whole. A unit fraction is any fraction with 1 as its numerator (top number), and a whole number for the denominator (bottom number) equal sign. Each unit fraction has a name. In order to give names to fractional parts, the whole must be divided in equal parts. One half is the name given when a whole is divided into two equal parts (not one over 2), when the whole is divided into four equal parts, each part will be called one quarter (not 1 fourth).

Inclusive Resources and Materials from Regional Specialists:

Additional Resources and Materials
Videos on fractions: Fractions for Kids - YouTube
Real World Fractions

Opportunities for Subject Integration:

Math: Telling time (Half past, quarter past the hour).

Language Arts: Syllabicate words and arrange according to the number of syllables.

Science: Comparing and ordering plants germinated according to height.

Social Studies: Arranging and comparing members of their families or classmates according to size.

Elements from Local Culture:

Use of the concept of 'half' in everyday situations – e.g. half pound of sugar, a half of a breadfruit, a half of a school day (half day).

Compete with other students to see who can eat half /quarter of given items (e.g. a half of a cookie , a quarter of a doucouna).

Resources for a learner who is struggling:

Song teaching fractions: Fractions Song For Kids | 2nd Grade - 3rd Grade - YouTube

Video: https://www.youtube.com/watch?v=362JVVvgYPE

Video: https://www.youtube.com/watch?v=7lz9qfUPtPY
Resources for a learner who needs challenge: Worded problems fractions: https://www.ixl.com/math/grade-2/fractions-of-a-whole-word-problems
Items of Inspiration (teaching tips, inspirational passages, connections to educational research): Tips on how to teach students about unit fractions: https://marvelmath.com/2022/08/09/how-to-teach-unit-fractions/

Essential Learning Outcome: Operations 1.1

Introduction to the Subject:

Addition and subtraction are used to solve many problems in our day-to-day activities. Buying and selling, giving and receiving all requires us to add or subtract. Students must learn these everyday skills to prepare them for their future. Addition and subtraction prepare children to learn other math content which is also pertinent to their daily lives.

Strand (Topic): Operations with Numbers
OECS Learning Standards: OS1, OS2, OS3, OS4

Essential Learning Outcomes: 1.1 Additive Thinking - Understanding the meaning of addition and subtraction and how they relate.

Grade Level Expectation:

Add up to three two-digit numbers using strategies based on place value and properties of operations.

Add and subtract, within 100, relating the strategy to a written method, using:

• Concrete models or drawings.

• Strategies based on place value.

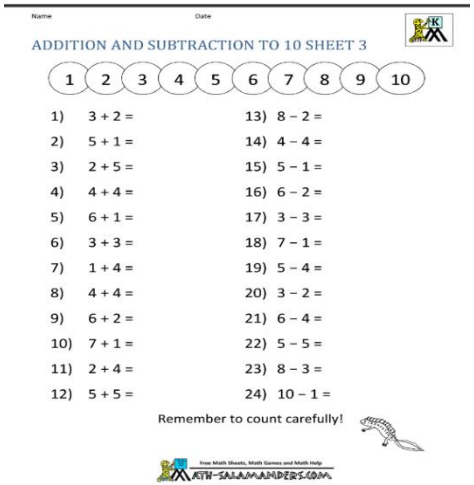
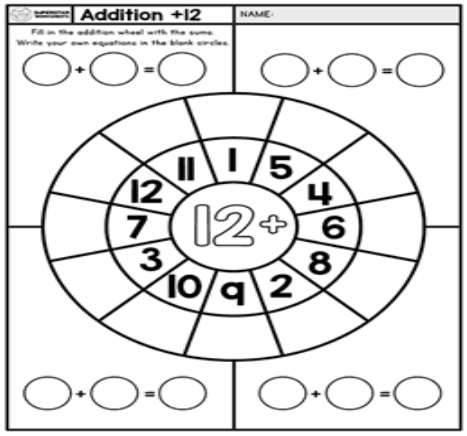
• Properties of operations.

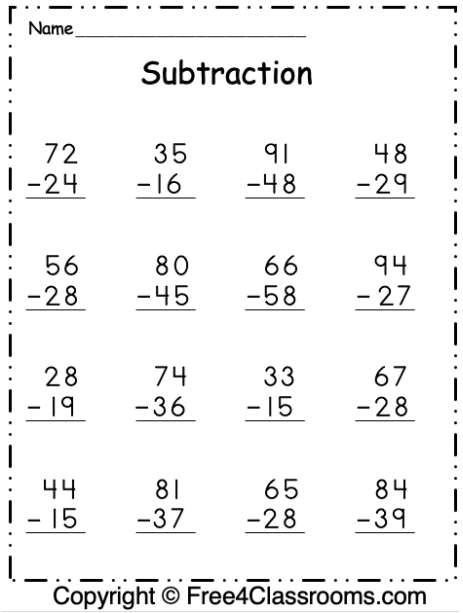
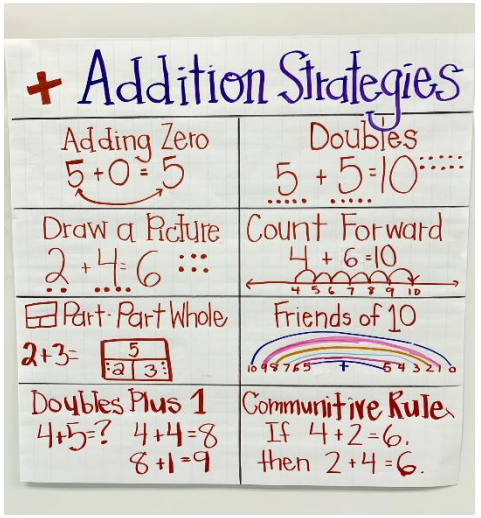
• Relationship between addition and subtraction - Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900. Represent and solve addition and subtraction word problems, within 100, with unknowns in all positions, by using representations and equations with a symbol for the unknown number to represent the problem, when solving:

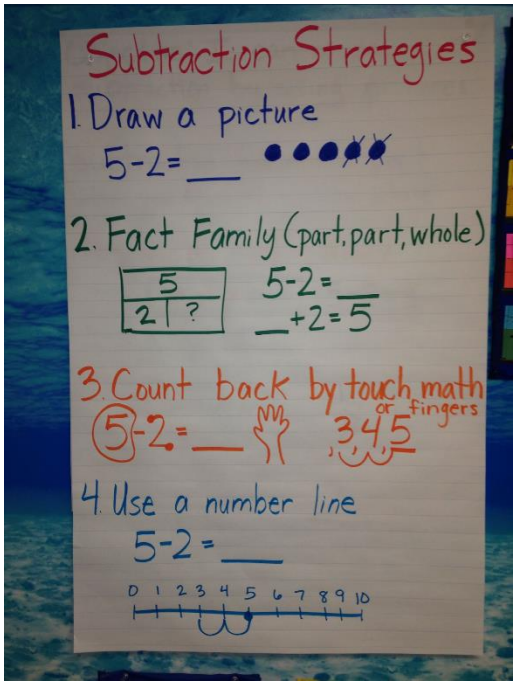
• One-Step problems: Add to/Take from-Start Unknown, Compare-Bigger Unknown, Compare-Smaller Unknown

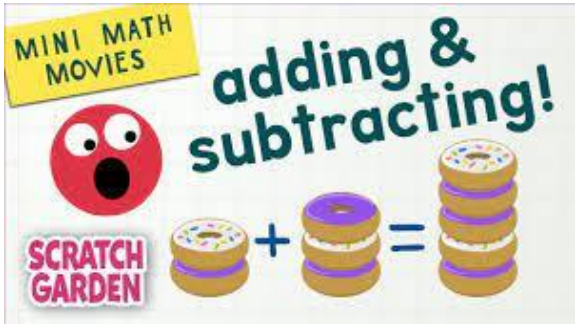
• Two-Step problems involving single digits: Add to/Take from-Change Unknown, Add to/Take From- Result Unknown

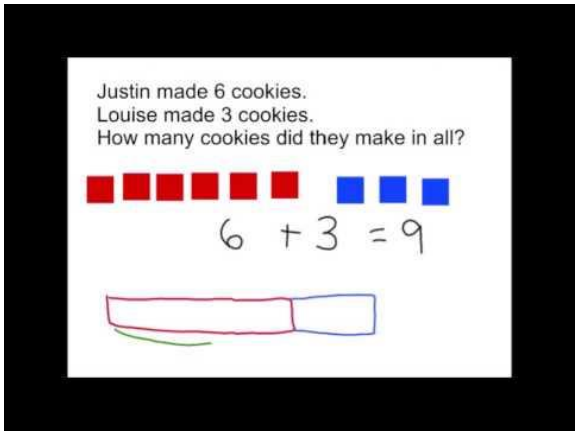
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Knowledge 1. Add up to three two-digit numbers within 100 using a variety of strategies without and with regrouping. 2. Subtract two-digit number from two-digit number using a variety of strategies without and with regrouping. 3. Mentally demonstrate their ability to add 10's or 100's up to 900 from a given number. 4. Identify that addition is the opposite of subtraction. 5. Use appropriate vocabulary to explain addition and subtraction strategies. **Skills** 1. Use a variety of strategies and tools to add and subtract two-digit numbers with and without regrouping. 2. Use problem solving strategies for up to two step problem involving addition	**Practice** *Students demonstrate their ability to add using various strategies, or strategy that works best for them.*  Name: _____ 2-DIGIT ADDITION (With Regrouping) **Directions:** Find the sums. 24 + 19 ; 13 + 28 ; 29 + 15 18 + 15 ; 35 + 37 ; 17 + 28 17 +36 ; 39 + 13 ; 14 + 29 36 +19 ; 32 + 19 ; 35 +27	Teacher provides students with opportunities to demonstrate their different strategies for adding and subtracting numbers. They can then be exposed to different strategies (e.g. place value mat, friends of ten, crossing out, bar model) and choose the ones with which they are most comfortable. Always move from the known or simple to unknown. Some students are confused when prerequisite skills are not properly understood. This is necessary to help students who need to understand how one concept is linked to another. - Allow students to explain how they could find the sum of 5 + 5 or any other addition fact. Provide experiences with estimation strategies using grouping of tens. - Provide opportunities for students to see subtraction as both a counting-up procedure and a counting-down procedure. (e.g., 15 – 11 by counting up from 11 or counting down from 15).

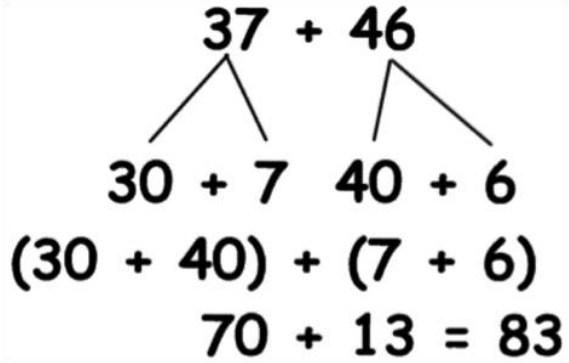
and subtraction using single digits. **Values** 1. List occasions when they have to add or subtract. 2. Appreciate the importance of knowing how to add and subtract in everyday life.	*https://i.etsystatic.com/31572743/r/il/9403a4/3993771075/il_fullxfull.3993771075_rnhh.jpg* https://www.math-salamanders.com/image-files/addition-subtraction-worksheet-to-10-3.gif  Name Date ADDITION AND SUBTRACTION TO 10 SHEET 3 1 2 3 4 5 6 7 8 9 10 1) 3 + 2 = 13) 8 – 2 = 2) 5 + 1 = 14) 4 – 4 = 3) 2 + 5 = 15) 5 – 1 = 4) 4 + 4 = 16) 6 – 2 = 5) 6 + 1 = 17) 3 – 3 = 6) 3 + 3 = 18) 7 – 1 = 7) 1 + 4 = 19) 5 – 4 = 8) 4 + 4 = 20) 3 – 2 = 9) 6 + 2 = 21) 6 – 4 = 10) 7 + 1 = 22) 5 – 5 = 11) 2 + 4 = 23) 8 – 3 = 12) 5 + 5 = 24) 10 – 1 = Remember to count carefully! MATH-SALAMANDERS.COM	Ask students to use logical reasoning to find basic  Addition +12 NAME: Fill in the addition wheel with the sums. Write your own equations in the blank circles. 12+ 11 1 5 4 6 8 2 9 10 3 7 12

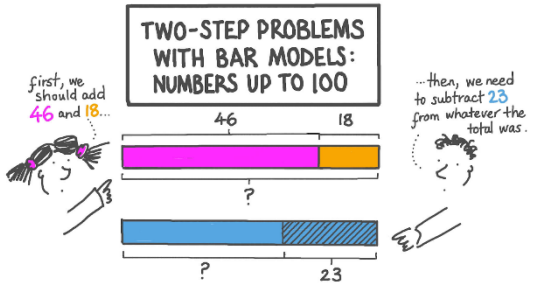
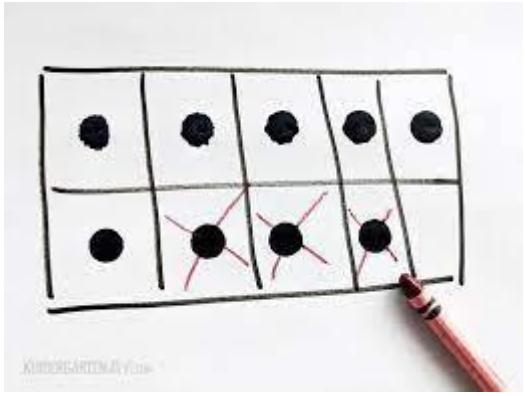
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Peer review Allow students to hear each other in pairs, groups or whole class articulate strategies they are using for correctness to guide each other.  Name_____ Subtraction 72 −24 ; 35 −16 ; 91 −48 ; 48 −29 56 −28 ; 80 −45 ; 66 −58 ; 94 −27 28 −19 ; 74 −36 ; 33 −15 ; 67 −28 44 −15 ; 81 −37 ; 65 −28 ; 84 −39 Copyright © Free4Classrooms.com Read worded problems and determine which strategy to use to solve the problem.	addition and subtraction facts for the same number. For example, if students have the number 12, what numbers can be added to give 12? Also, what numbers when subtracted can will give 12? https://www.google.com/url?sa=i&url=https%3A%2F%2Fsuperstarworksheets.com  https://pbs.twimg.com/media/DqzKYMeUcAAaPzG.jpg:large Provide opportunities for students to match number sentence to a given story problem. - Allow students to model simple addition and subtraction using concrete or visual representations and record the process symbolically. E.g. 5 + 6 = 11.

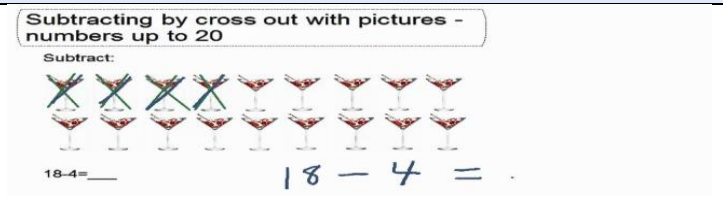
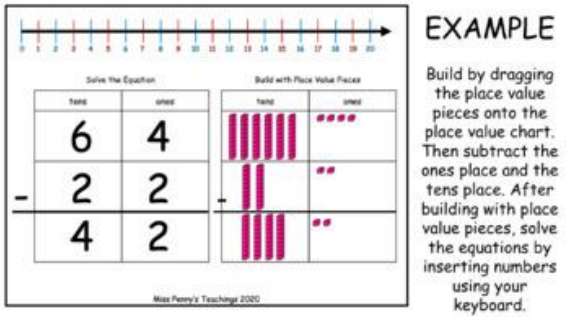
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	https://files.liveworksheets.com/def_files/2020/10/11/1011193510683027/1011193510683027001.jpg Name: _____ Date: _____ Mathematics: Addition and Subtraction Word Problems facts to 20 Homework Solve the word problems. *Remember* to use the skills on how to solve a problem. **Problems** / **Workings** 1. Marie had 16 hotdogs. She ate 4. How many hotdogs does she have left? _____ 2. There are 10 dogs in the yard. 5 more dogs came into the yard. How many dogs are in the yard? _____ 3. Henry buys 4 shirts on Monday, 4 on Tuesday and 6 on Thursday. How many shirts did he buy? _____ 4. Patrick had 19 cats. He gave 6 to Pat and 7 to Pam. How many cats does Patrick have left? _____ **Online Games** Students will place words correctly under the heading "Addition" or "Subtraction" to demonstrate their understanding of what the different words require.	Give students opportunities to use support manipulatives, develop mental strategies and develop personal strategies for adding and subtracting.  https://i.pinimg.com/originals/07/11/f8/0711f80b1ddb73e5cadfc2282a4e590c.jpg Present videos to students to help them reinforce the concept of how to add and subtract numbers. This can serve as a strategy to help weak students in a one-o-one session as it is demonstrated via another medium.

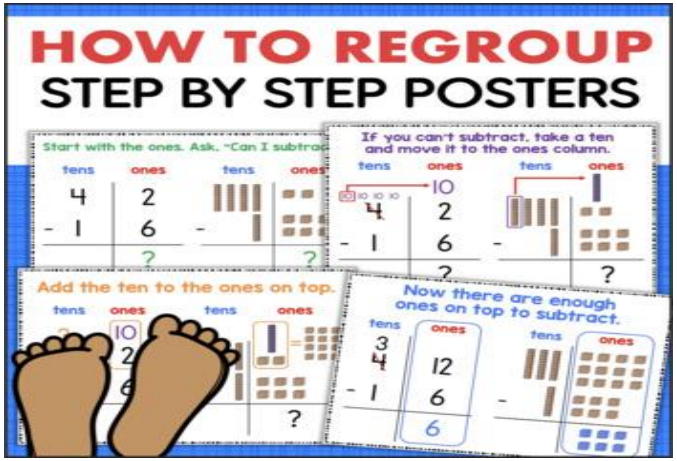
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 Link: https://wordwall.net/resource/22320288	 Link: Adding & Subtracting! | Mini Math Movies | Scratch Garden - YouTube **Use simple word problems initially.**

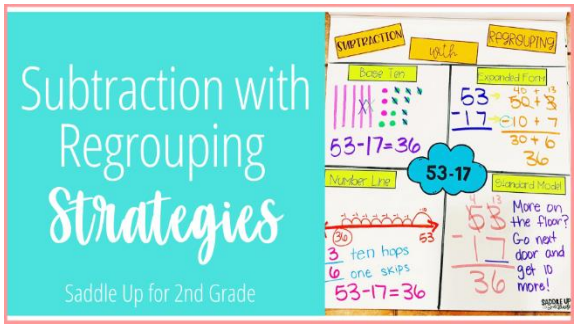
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Students participate in an activity in which they compete with each other to quickly calculate addition and subtraction items mentally. They then determine which number sentences are correct.  Link: https://wordwall.net/resource/33590143	**Word problems are introduced to students for them to make sense of how addition and subtraction are used in the real world.** They begin to understand how mathematical information can be extracted from words that can then be represented by symbols. It is important to stress the importance on representing it correctly without changing the meaning of the words.  https://media.nagwa.com/948143630512/en/thumbnail_l.jpeg

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		Decomposition when adding  https://www.scholastic.com/content/dam/parents/migrated-assets/blogs/body-text-images-10/math-place-value-1.png **Using mental maths** **58 + 35 = 93** **Take 2 from 35 and add to 58 to make 60. 33 remains from the 35. The students will now add 58 + 2 + 33 = 60 + 33 = 93** **Bar Model for addition and subtraction**

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		 https://media.nagwa.com/948143630512/en/thumbnail_l.jpeg  *Source:https://www.kindergartenworks.com/wp-content/uploads/2012/04/Modeling-subtraction-by-crossing-items-out.jpg* **Crossing out method**

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		 Source: https://i.ytimg.com/vi/0ywIQQ8AZM8/maxresdefault.jpg **Using place value mat** Sam has 64 marbles. He gives 22 marbles to Jim. How many marbles does Sam have left?  https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.teacherspayteachers.com%2FProduct%2FTwo-Digit-Subtraction-Building-with-Place-Value-Pieces-6100646&psig=AOvVaw033hCI9kZod0WxNOmw7z13&ust=1686832710242000&source=images&cd=vfe&ved=0CBEQjRxqFwoTCKCjg9bjwv8CFQAAAAAdAAAAABAE

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		With regrouping  https://ecdn.teacherspayteachers.com/thumbitem/Regrouping-Made-Easy-Step-By-Step-Posters-for-Visual-Learners-1682975191/original-533907-1.jpg **Other Strategies** **Mental Maths strategies** **e.g. 1** **63 - 34 =** **Students can take one from 34 which gives 33. It is easy to subtract now.**

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		63 - 33 = 30 but one more needs to be subtracted so **30 - 1 = 29** **E.g. 2** **45 - 19 =** **Students can add one to 19 which gives 20. It is easy to subtract now.** **45 - 20 = 25 but we need to add back the one we took, so** **25 + 1 = 26**  https://saddleupfor2ndgrade.com/wp-content/uploads/2022/01/Subtraction-with-Regrouping-Featured-Image.png

Useful Content Knowledge for the Teacher about the Outcome: Addition and subtraction are two operations which must be clear to young children. Addition in math is a process of combining two or more numbers. Addends are the numbers being added, and the result or the final answer we get after the process is called the sum. The operation or process of finding the difference between two numbers or quantities is known as subtraction. To subtract a number from another number is also referred to as 'taking away one number from another. When we subtract two numbers, we commonly use some terms that are used in a subtraction expression:

Minuend: A minuend is the number from which the other number is subtracted.

Subtrahend: A subtrahend is the number which is to be subtracted from the minuend.

Difference: A difference is the final result after subtracting the subtrahend from the minuend.

Addition and subtraction are two Math operations that are opposite of each other. In other words, a worked addition sum can be switched to subtraction where pupils will see the relationship between the two operations. For example, 38 - 17 = 21 (Subtraction). This operation when reversed will be 21 + 17 = 38 (Addition). This can be used to prove if their answers are correct.

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

Additional Resources and Materials
Addition link: https://www.ixl.com/math/grade-2/write-addition-sentences-to-describe-pictures
Subtraction link: https://www.ixl.com/math/grade-2/write-subtraction-sentences-to-describe-pictures-up-to-two-digits

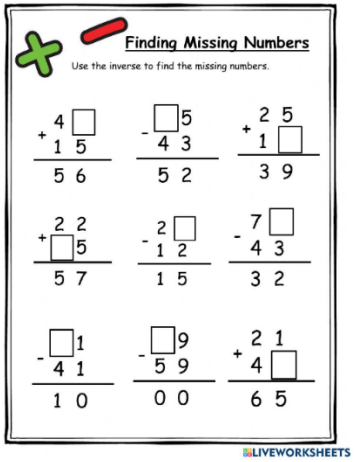
Opportunities for Subject Integration:

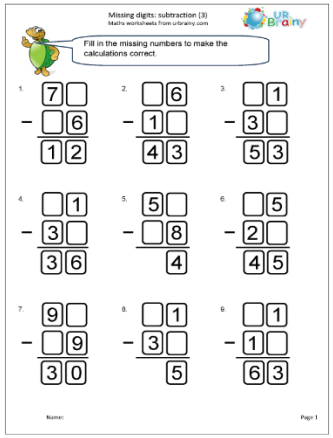
Math - Addition and subtraction of money.
Language Arts - Adding prefixes and suffixes to root words/Extracting root words from given words.
Science - Calculating the amount of rain that fell throughout a week.
Social Studies - Population (census) number of persons in a family (babies being born, persons dying, immigration and migration).
HFLE /Art/Craft - Students express their feelings in drawing, or orally about gaining or losing family members or members of classes or any group to which they belong.

Elements from Local Culture:
Fish festival/Fisherman's Day activities: The number of boats that went out compared to those who came back, number of fish caught by fishermen etc.
The number of students in class who participate in carnival, Easter or Christmas activities versus those who did not.

Resources for a learner who is struggling: Link to activities teaching simple addition and subtraction: [Add and subtract within 20: FAQ (article) | Khan Academy]
Online Game: [IXL | Molly Adds & Subtracts from 20]

Resources for a learner who needs a challenge: https://files.liveworksheets.com/def_files/2021/12/22/11222111145228443/11222111145228443001.jpg





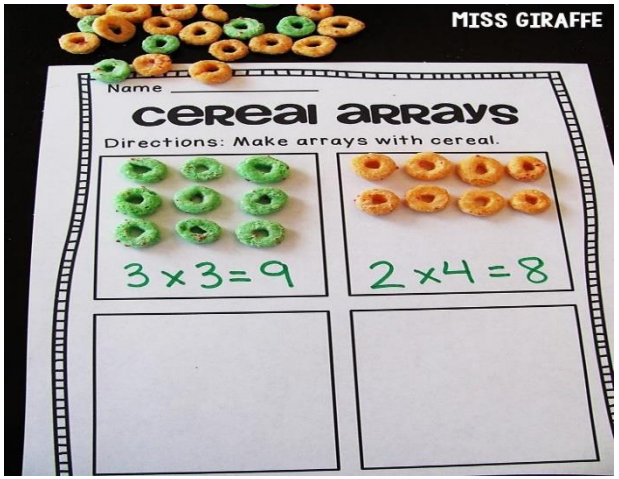
Essential Learning Outcome: Operations 1.2

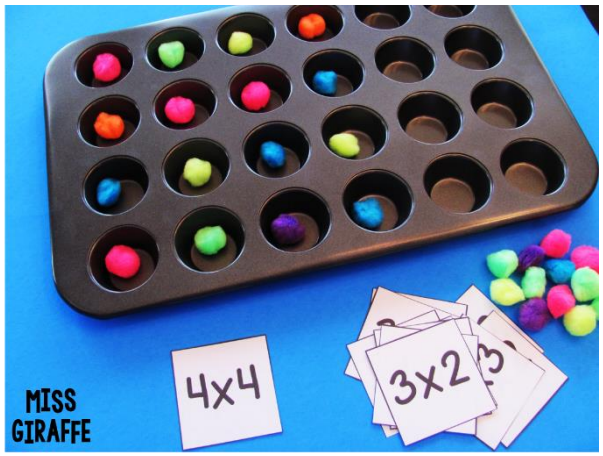
Introduction to the Subject: Addition and subtraction are used to solve many problems in our day-to-day activities. Buying and selling, giving and receiving all requires us to add or subtract. Students must learn these everyday skills to prepare them for their future. Addition and subtraction prepare children to learn other math content which is also pertinent to their daily lives.
Strand (Topic)Operations with Numbers
Essential Learning Outcomes: 1.2: Additive Thinking - Compute Fluently **Link to OECS Learning Standards: None**
Grade Level Expectations: Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns. Write an equation to express the total as a sum of equal addends. Use the properties of addition and subtraction, and the relationships between addition and multiplication and between subtraction and division, to solve problems and check calculations.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Knowledge 1. Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns. 2. Write an equation to express total as a sum of equal addends.	**Observation** Students are given two dice. They are asked to roll each die: one die will represent the number of columns and the other will represent the number of rows that they will make. Students will then arrange items to create arrays, then identify the total number of objects in each array. Teacher observes students to determine if they can create arrays and identify the total number of objects in each array.	Reinforce counting in various ways: 2, 5 , 10 etc. using charts to connect number of objects to numbers in the counting sequence. Give students opportunities to separate any given quantity into equal groups or sets. E.g. Share 12 cupcakes among 4 children. How many cupcakes will each child get?

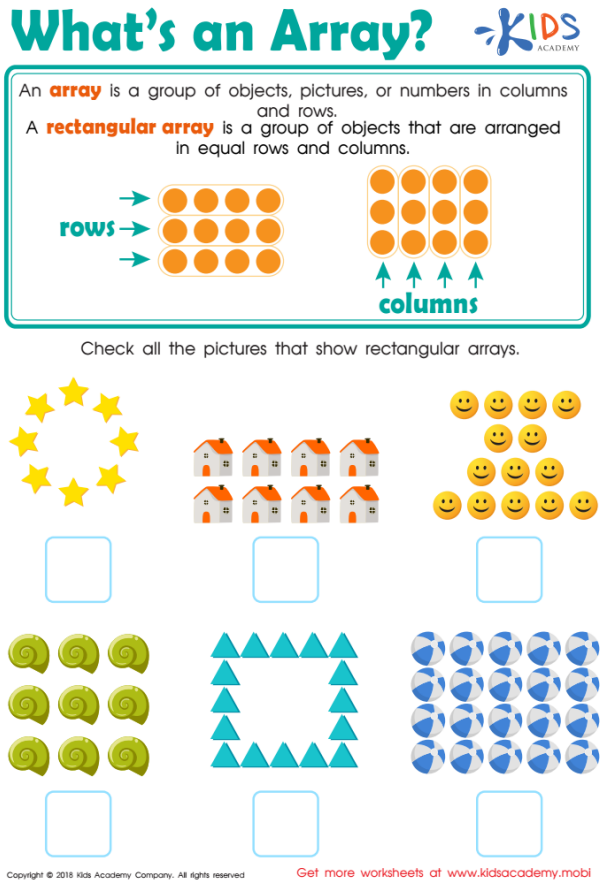
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Skills 1. Demonstrate initial multiplication and division knowledge related to sharing, grouping and array. 2. Show how multiplication undo division and vice versa. 3. Finding a missing quantity given the whole and another known quantity. **Values** 1. Identify times in their daily lives where they would have to use the multiplication strategy or identify totals using array.	 https://lifebetweensummers.com/wp-content/uploads/2019/09/IMG_1544-1-1024x1024.jpg Students are given objects and asked to put items in arrays based on the number given to them.  Source:https://media.istockphoto.com/id/514003464/photo/lego-bricks-in-child-hands.jpg?s=1024x1024&w=is&k=20&c=DszMIttiAqgitPdVyExA6jhJvoFlYyKzT1hoEGltARk=	- Give students opportunities to combine groups to find the whole. E.g. If there are 4 mangoes in one bag, how many mangoes are there in 5 similar bags? Allow students to represent array by making sets of or rows of blocks, counters, or square tiles. Allow students to use number lines, chairs, floor tiles to make jump of as they count on the number line to find a given product. Present a video about the concept of arrays in real life situations. After watching the video, students will identify other examples of the use of arrays in their environment. Video link: https://www.youtube.com/watch?v=5ae6Wn66epg Present students with a number of objects (e.g. toy cars, sweets, counters, building blocks) Have students arrange items in arrays of their choice (12 objects can be arranged in arrays such as: 1 column,12 rows 2 columns, 6 rows 3 columns, 4 rows

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Students are given a fixed number and are asked to create arrays. (e.g., 12, 15 , 18)  Source:https://domf5oio6qrcr.cloudfront.net/medialibrary/11898/conversions/15ac4126-058d-43ef-8745-c9a9aef7c11b-thumb.jpg	 https://evilmathwizard.com/wp-content/uploads/2014/10/arrays-1024x731.jpg Students play a game and arrange items based on the number rolled on the dice. 

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Students are given a number sentence to create an array.  Source:https://i.pinimg.com/736x/b7/c9/cd/b7c9cdca4cf8a2e72e92c30083a0ad44.jpg	https://lifebetweensummers.com/wp-content/uploads/2021/03/Picture1.png - Allow students to demonstrate repeated addition as a strategy for multiplication. Modelling with concrete grouping first to show equal groups using playing cards etc. Allow students to discover through playing with concrete material that multiplication and division undo each other. E.g. 4 groups of 5 equals 20 then 20 pencils placed in groups of 4 will be equal to 5 pencils in each group. - Provide opportunities for students to use concrete materials to find missing quantities then represent same with number sentences. E.g. 5 x __ = 10 then, 10 ÷ 5 = __

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 Source:https://3.bp.blogspot.com/-PG3bYx6S-Ao/VbQbObYu0BI/AAAAAAAABbI/nW7h3R147fw/s1600/Muffin%2BPan%2BArrays%2Bh.png	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	- Students create a number sentence based on the array.  Source:https://1.bp.blogspot.com/-284L06RRxxE/VbQaqMctaKI/AAAAAAAABZo/Q2dBCmU_-6Y/s1600/Cookie%2BTray%2BArrays%2Bv.png Worksheets	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 https://media.kidsacademy.mobi/worksheets/preview/whats-an-array.png Create a number sentence based on the picture.	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Teacher presents examples of arrays and students determine how to write equations to match the arrays. **Game** Students are placed into teams. Each team is given the same number (e.g. 16) and is asked to compete to see which team can create the largest number of arrays and number sentences for the given number. The first team to do so will be the winner.	

Useful Content Knowledge for the Teacher about the Outcome: Multiplication is one of the four basic Math operations. It is the opposite of division. When we multiply numbers (factors), our answer (product) gets bigger. Multiplication gives the same answer as repeated addition, that is, we add the same number/quantity a number of times (5 + 5 + 5 + 5). In writing a multiplication sum from sets, always put the number of sets first, then the number in each set. For example, 4 sets/groups of 5 will be 4 x 5 =20
Inclusive Resources and Materials from Regional Specialists
Additional Resources and Materials **Video : BrainpopJr Arrays and Easy Quiz**
Opportunities for Subject Integration: Math - Calculating the cost of items with the same unit cost. Science - Planting seeds or seedlings in arrays for germination.
Elements from Local Culture: Kitchen garden planted in arrays, or arrays on farms or in green houses. Sharing items (damsels , tamarind balls, plums, jar plums) among their friends (3 or 4 persons).

Resources for a learner who is struggling: Online Games: https://wordwall.net/resource/10325265

Resources for a learner who needs challenge: Online Games: https://wordwall.net/resource/31944214

https://wordwall.net/resource/34506607

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

Teaching students about arrays: https://missgiraffesclass.blogspot.com/2015/07/how-to-teach-arrays.html

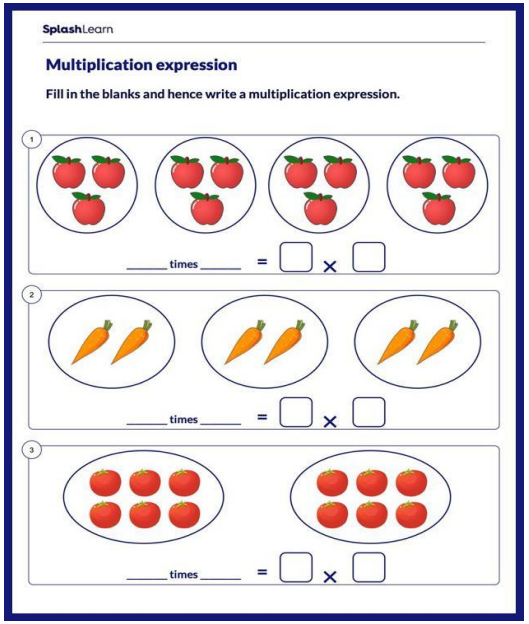
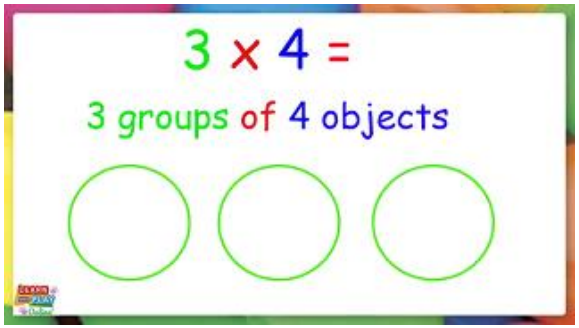
https://teachingsecondgrade.com/how-to-teach-arrays/

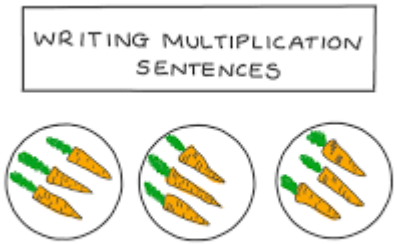
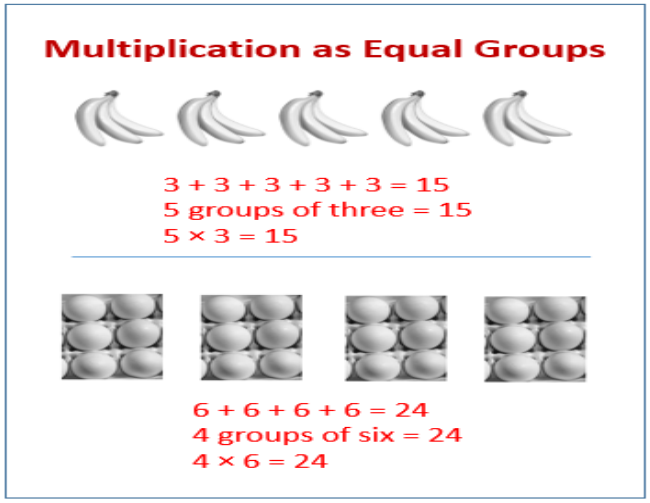
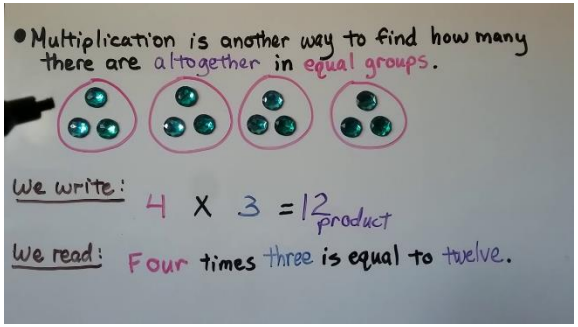
https://www.hmhco.com/blog/teaching-multiplication-with-arrays-in-math

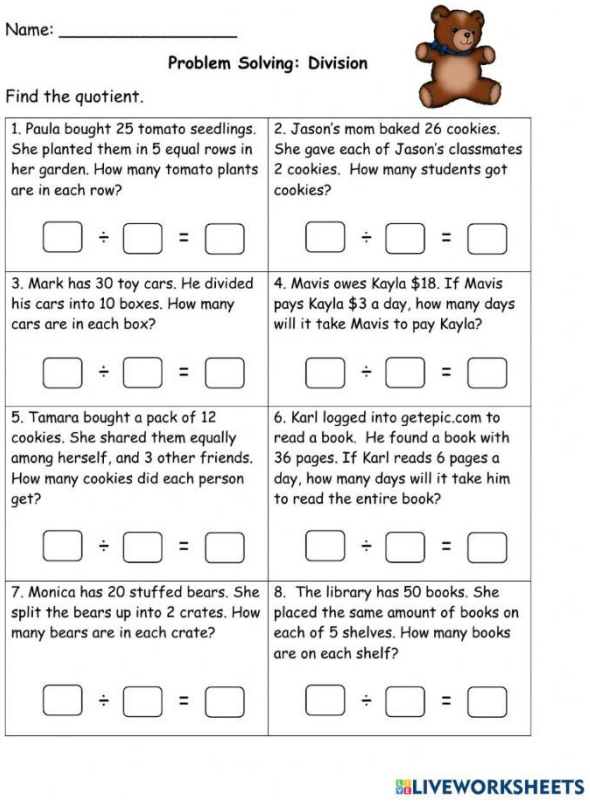
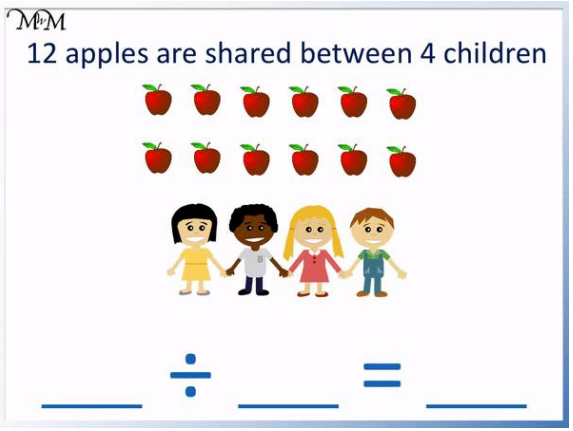
Research Study: https://www.researchgate.net/publication/304805584_Using_arrays_for_conceptual_understanding_of_multiplication_and_division

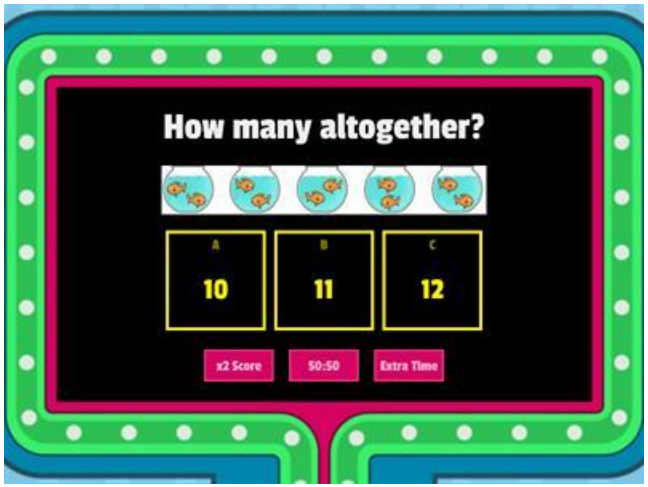
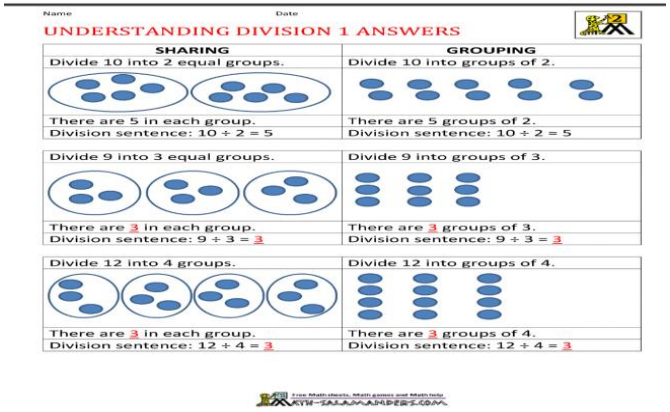
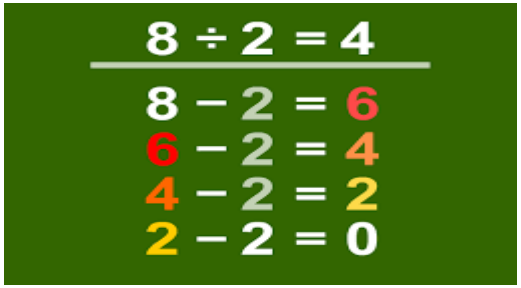
Essential Learning Outcome: Operations 2.1

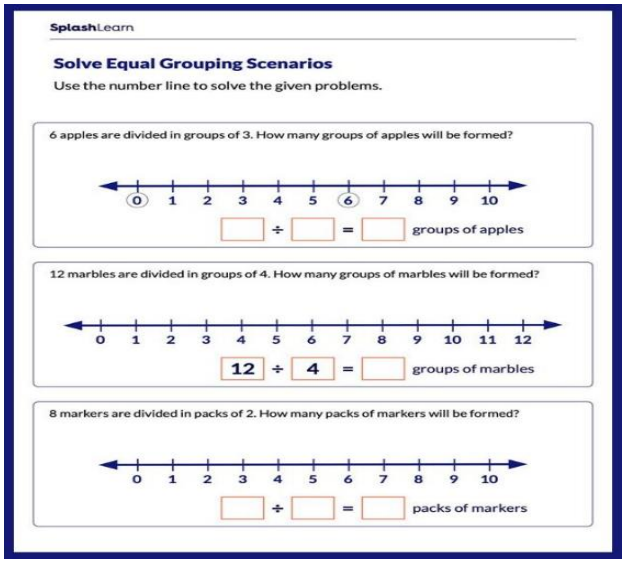
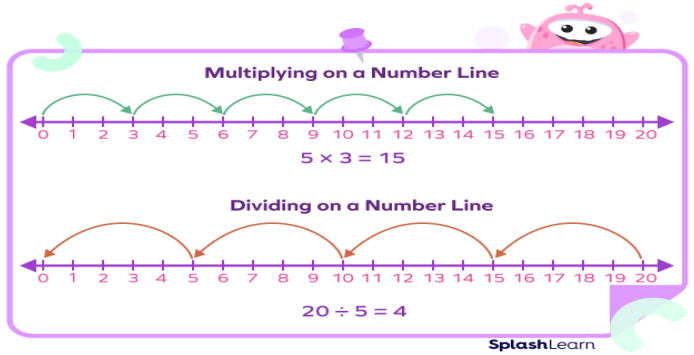
Introduction to the Subject: Multiplication and division form the building block for other math concepts. As children share items with friends, put items in array and handle money, they are practising multiplication and division in their daily activities. Children are expected to understand multiplication and division in order to manage other math concepts and apply the skills to their daily interactions.
Strand (Topic): Operational Sense
Essential Learning Outcomes: 2.1: Multiplicative Thinking - Understanding the meaning of multiplication and division and how they relate
Grade Level Expectations: Represent multiplication as repeated equal groups, including groups of one-half and one-fourth, and solve related problems, using various tools and drawings. Represent division of up to 12 items as the equal sharing of a quantity, and solve related problems, using various tools and drawings.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Knowledge 1. Interpret repeated addition procedures, using terms such as 'sets of', 'times', 'groups of. 2. Use mathematical language such as '4 threes' and '2 groups of 5' to describe equal groups. 3. Demonstrate their understanding of the word multiplication and division by correctly solving problems. **Skills** 1. Write a number sentence for a given situation involving multiplication or division. 2. Solve a 1-step picture problem involving multiplication and division. 3. Work out a multiplication fact by repeated addition.	**Observation** Students complete worksheets demonstrating their understanding of multiplication as equal groups. Worksheets  https://cdn.splashmath.com/cms_assets/s/math-worksheets/represent-equal-groups-as-multiplication.jpeg	Reinforce the concepts/ideas from the array method to guide multiplication. Students look at video demonstrating multiplication: Multiplication for Kids! - YouTube 

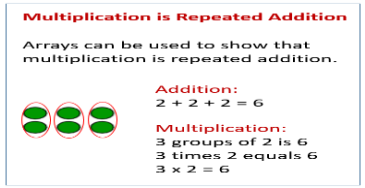
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
4. Make a number story for a given multiplication or division sentence. 5. Demonstrate the ability to share objects equally in groups or sets. **Values** 1. Work cooperatively to place manipulatives in groups to demonstrate repeated addition.	Students create a number story based on the picture given to them.  Complete division worded problems.	Teacher demonstrates the concept of multiplication as equal groups.  https://www.onlinemathlearning.com/image-files/multiplication-equal-groups.png Students use manipulatives to construct their own sets to show multiplication. 

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 https://files.liveworksheets.com/def_files/2021/3/10/10310174530324513/10310174530324513001.jpg Online Games	https://i.ytimg.com/vi/LkBHtTxq4V4/maxresdefault.jpg Teachers should use authentic instruction to show students through videos of various strategies when division occurs in their daily lives.  https://i0.wp.com/www.mathswithmum.com/wp-content/uploads/2020/04/Division-Sentences-8.gif?resize=600%2C450&ssl=1 Link: Division Sentences - Maths with Mum

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Students play games online counting sets to solve multiplication problems. 	**Grouping**  https://www.2nd-grade-math-salamanders.com/image-files/2nd-grade-division-worksheets-understanding-division-1ans.gif **Repeated Subtraction**  https://cdn-jr.brainpop.com/math/additionandsubtraction/repeatedsubtraction/screenshot_2.png **Using a number line**

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Link: https://wordwall.net/resource/10268142  https://cdn.splashmath.com/cms_assets/s/math-worksheets/solve-equal-grouping-scenarios-using-number-line.jpeg	The teacher can make the connection to multiplying by showing that division is going in the opposite direction.  https://www.splashlearn.com/math-vocabulary/wp-content/uploads/2022/10/Number-Line-6.png

Useful Content Knowledge for the Teacher about the Outcome:



Inclusive Resources and Materials from Regional Specialists

Additional Resources and Materials

Link with educational games: https://www.ixl.com/math/grade-2/count-equal-groups

Opportunities for Subject Integration:

Language Arts - Students engage in story writing including repeated addition. For example: Running a bakery for a week.

Math - make connections to array models for buildings such as how window/door panes are arranged.

Science - Students engage in recording the amount of water given to plants daily while watering plants for germination. Students will be able to calculate the amount of water given at the end of the week.

Social Studies - Students calculate the consumption of selected goods used by people monthly.

Art/Craft - Drawing or showing objects shared with friends.

Elements from Local Culture: Vegetables and fruits are placed in heaps on tables or counters to be sold.

Resources for a learner who is struggling: Online Games: Division - https://www.ixl.com/math/grade-2/divide-by-counting-equal-groups

https://www.youtube.com/watch?v=qQNFyx9hJeM

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

Resources for a learner who needs challenge: Online Games: Addition multiplication - https://www.ixl.com/math/grade-2/relate-addition-and-multiplication-for-equal-groups

Essential Learning Outcome: Patterns and Relationships 1.1

Introduction to the Subject: Learning about patterns and relationships helps students to make their own predictions and determine missing values by applying an identified rule as well as help them form logical connections. Patterns are important as they provide students with the skills needed to better understand Mathematical concepts. It creates a clearer understanding of relationships and therefore helps improve students' reasoning skills. It forms the basis for the understanding of algebra and allows for quicker problem solving.
Strand (Topic): Patterns and Relationships
Essential Learning Outcomes: Essential Learning Outcome **PR 1.1** - Learners will create and extend simple patterns, repeating and growing patterns.
Grade Level Expectations: -Identify and describe a variety of patterns involving simple geometric designs including patterns found in real life context

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Learners will be expected to: **Knowledge:** ● Describe a given pattern. ● Identify whether given terms form a pattern or not. ● Make predictions as to what may come next in a given pattern.	**Gathering information through Teacher Conversation, Observation and Product**s ● Are students able to recognize and describe patterns found in their environment? (patterns in the communities, on fabrics, patterns on a calendars). ***Symbolic*** Present learners with a piece of fabric with a similar design as shown below. Learners will	1. Take students on a field trip in the community or within their school environment and allow them to identify patterns around them. e.g. patterns with buildings, or patterns of houses or how the houses and streets are located. ● Have students discuss why they believe there is a pattern or not and what is the pattern.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies

Skills

- Create and extend simple patterns with 3-5 elements.
- Create patterns resulting from repeating an operation or making a repeated change to an attribute.
- Copy and extend a repeating pattern (using manipulatives, diagrams, body movements/actions/sounds)
- Translate simple repeating patterns (E.g., a repeating orientation pattern to a repeating sound pattern, etc.).
- Copy and extend growing patterns.
- Recognize patterns as either repeating or growing.

Values:

look at the illustration to identify the rule and add on to the repetition.

Checklist

Can identify shapes and rule *(described in own words)*	Can accurately continue the pattern
☑)	☑)

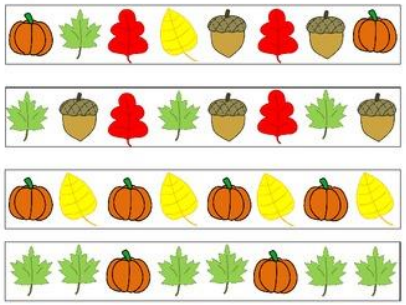
Retrieved from https://images.google.com/

- Can students demonstrate patterns through dancing, or performing actions? E.g. clap, stomp feet, click.

Observation

Have students listen to a sound pattern based on the following. Students will line up to continue the pattern by demonstrating the next correct action (term).

Student can describe pattern	Student demonstrates next term in



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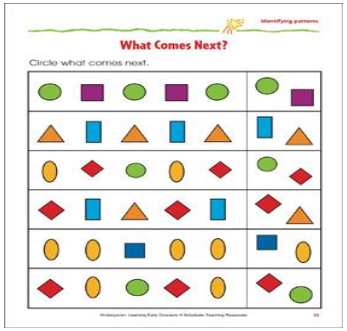
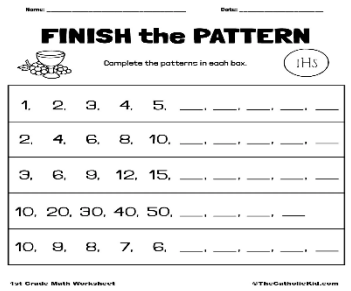
- Provide opportunities for students to build, extend and describe patterns formed with letters, numbers and shapes.





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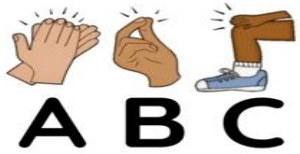
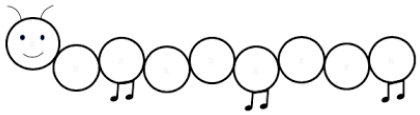
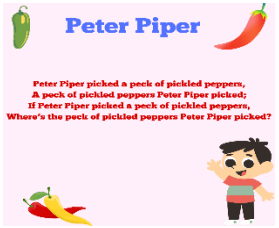
- Provide opportunities for learners to create their pattern and explain the rule formed by these patterns.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
• Acknowledge patterns in their environment by identifying and describing the pattern observed around them. • Identify and enjoy patterns in poems, stories, (folk and modern) within their culture.	<table><tr><td></td><td>pattern</td></tr><tr><td>✅</td><td>✅</td></tr></table> (e.g. two claps, a snap and a tap)  Retrieved from https://images.google.com/ • Are students able to describe patterns given and patterns formed? E.g. 1, 2, 3, 4, 5, ___, ____ ***Concrete*** **Think, Pair, Share,** Have students identify repeating patterns within their environment. Leaves, towels, blouses, glasses, rocks, plants, mugs, shoes, pencils <table><tr><td>**Think** (Learner identifies</td><td>**Pair** (Within</td><td>**Share** (Pair</td></tr></table>	• Students can create their own pattern for example they can create a pattern on a given template like the caterpillar below:  Retrieved from https://images.google.com/ • Use story books, printed fabrics, poems, chants and songs and allow pupils to identify patterns in each.   Retrieved from https://images.google.com/ • Provide opportunities for pupils to demonstrate patterns through actions, sounds. **Growing patterns** Students can be arranged into small groups where possible. Examples of activity to help students understand growing patterns can include: Begin the activity by having the first group snapping their fingers. The second group takes their turn by snapping their fingers and

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies

individual pattern)	pair, learners describe each other's pattern)	presents their patterns to class and allows class to describe the pattern)
☑	☑	

The following materials could be used for this assessment:

Retrieved from https://images.google.com/

- Can students extend given patterns involving shapes, colour and sizes?

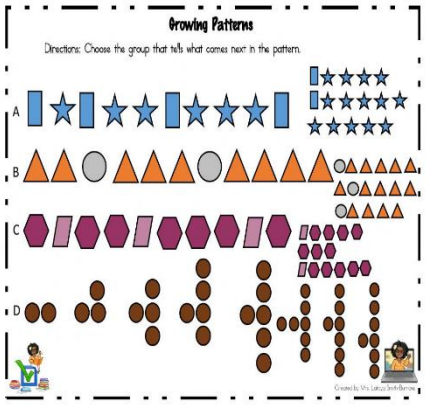
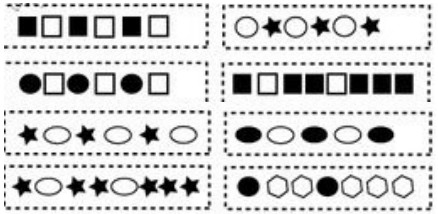
Symbolic (product)

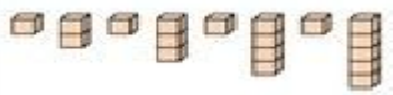
then adding an action like clapping their hands. The third group repeats the first and second actions and adds a third. This pattern continues until the last group adds their own action. Now have the whole class do the entire sequence together.

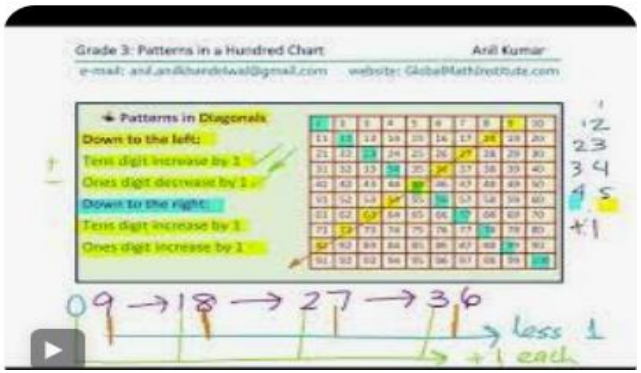
- Also, give pupils opportunities to build and extend patterns using geometric shapes.
- Ask students to explain what is happening in the pattern below

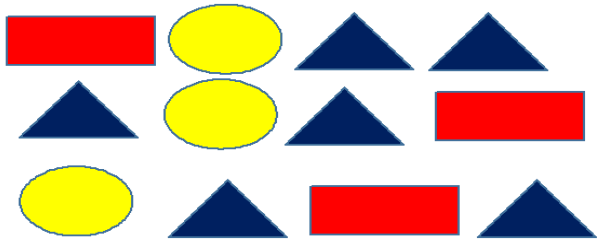
Retrieved from https://images.google.com/

- Provide students with small coloured tiles and ask them to create what would come next in the pattern.
- Provide Students with practice to develop the skill of creating pattern. For example, students will be given a worksheet to choose the group that would come next in a growing pattern.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Students should be able to identify a pattern as growing or repeating. Students should be able to extend growing patterns.  Have students discuss what they observe about this pattern. 1. Is it a repeating pattern? Circle ***Yes*** or ***No*** 2. If yes, draw the next five terms to continue the pattern. • Can students explain the pattern rule used? e.g. 2, 4,6,8,10, • Are students able to build patterns using geometric shapes? E.g. **Product Exit Slip** Students will answer the following: Johnny did this with his building blocks	 Retrieved from https://images.google.com/ • Allow pupils to play games to explore patterns with letters, numbers or designs. For example, students can be given cut out pattern strips and asked to stick them under the correct types of patterns.  Retrieved from https://images.google.com/ E.g. 3, 5, 7, __, ___, ____

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 Retrieved from https://images.google.com/ 1. Is that a pattern? Circle ***Yes*** or ***No*** 2. What kind of pattern is it? 3. Draw what will come next. Tina wrote these numbers down on her book 5, 10, 15, 20, 5, 10, 15, 20 Retrieved from https://images.google.com/ 1. Describe the pattern in your own words? 2. Is it growing or repeating? ***Yes*** or ***No***	E.g. a, b, ,b, a, b, b ___, ___ Repeating Pattern | Growing Pattern • Provide students with number lines to represent patterns.  Retrieved from https://images.google.com/

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		• Allow students to use skip counting to extend given number pattern to 100. • Allow students to recognize and fill in missing elements in patterns. • Provide pupils with the hundreds chart and allow them to identify patterns and the rule used, for example:  - Retrieved from: https://www.youtube.com/@MathematicsTutor Learn From Anil Kumar • Give pupils a number of patterns and allow them to identify the core of the patterns. • Provide students with opportunities to discover and translate repeating patterns with concrete materials, shapes and letters. Engage students in translating patterns

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		- this gives pupils opportunities to rearrange given patterns in different orders. For example: 

Useful Content Knowledge for the Teacher about the Outcome:

Pattern refers to what is formed when objects numbers or shapes are arranged or laid out based on a rule.

Sequence is the list of numbers /objects which are used to form a pattern.

Terms are the numbers/objects in a sequence that form the pattern. They are also referred to as elements.

Core is the part of a repeating pattern that stays the same.

Repeating Pattern is a pattern in which the terms are repeated over and over.

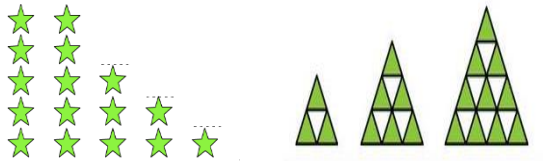
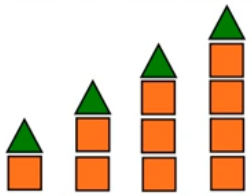
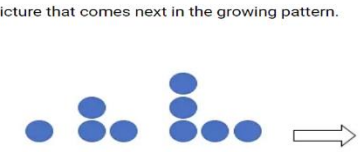
Growing Pattern is a pattern with the terms increasing each time.

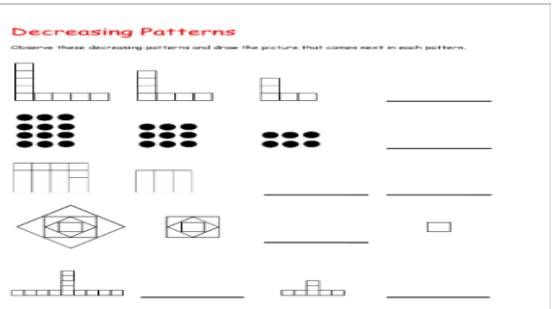
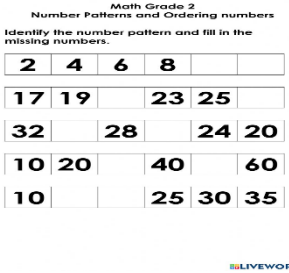
Inclusive Resources and Materials from Regional Specialists: Interlocking cubes, colour sequences worksheets, pattern blocks, poems, songs, chants, sentences, shells, pebbles, Cuisenaire rods, Dominoes, and two-colour counters.

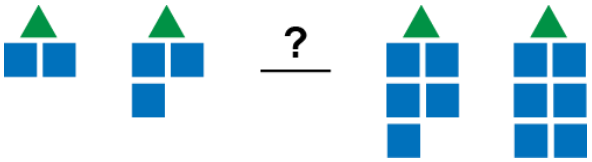
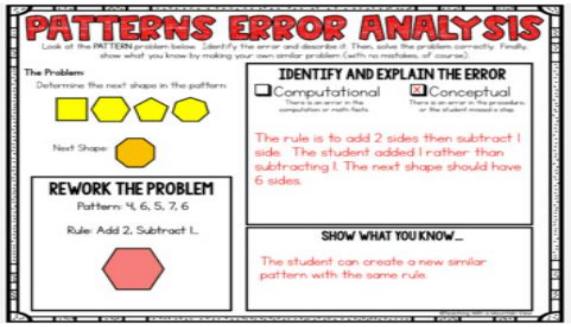
Essential Learning Outcome: Patterns and Relationships 1.2

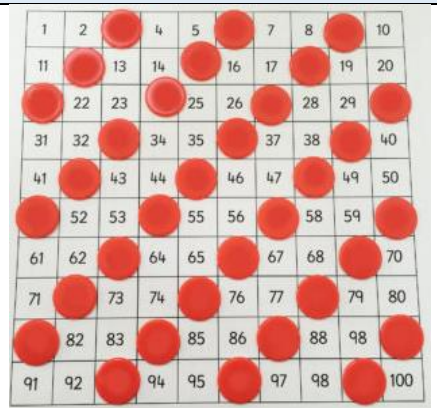
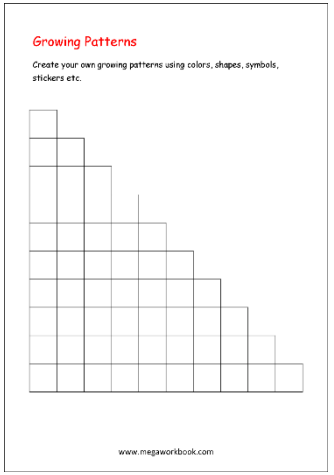
Introduction to the Subject: Learning about patterns and relationships helps students to make their own predictions and determine missing values by applying an identified rule as well as help them form logical connections. Patterns are important as they provide students with the skills needed to better understand Mathematical concepts. It creates a clearer understanding of relationships and therefore helps improve students' reasoning skills. It forms the basis for the understanding of algebra and allows for quicker problem solving.
Strand (Topic): Patterns and Relations
Essential Learning Outcomes PR 1.2: Recognizing, Describing and Extending Patterns - Increasing and Decreasing Patterns
Grade Level Expectations: *Create and translate patterns using various representations, including shapes and numbers. *Determine pattern rules and use them to extend patterns, make and justify predictions, and identify missing elements in patterns represented with shapes and numbers. *Create and describe patterns to illustrate relationships among whole numbers up to 100

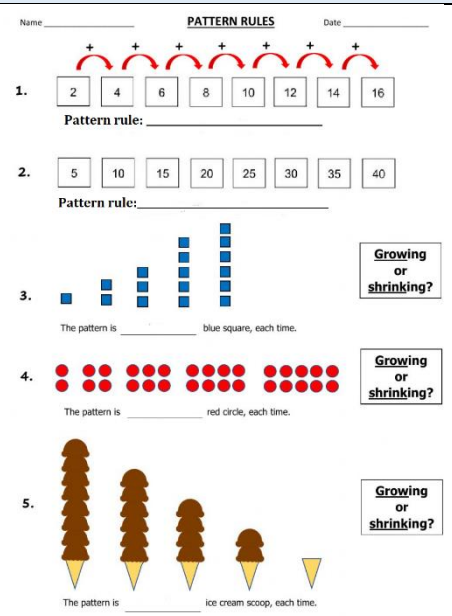
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Knowledge ● Determine the rule used to extend a growing and a shrinking pattern. ● Identify, describe, and create through investigation, growing and shrinking patterns (increasing and decreasing) involving addition and subtraction.	**<u>Gathering information through Observation and Products</u>** ● Are students able to determine whether a pattern is growing or shrinking? ● Can students demonstrate their knowledge about growing, shrinking and repeated patterns? Have students identify which pattern is the increasing / growing pattern and which is the decreasing/shrinking pattern.	Provide students with the opportunity to

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Skills ● Solve simple patterns involving increasing and decreasing patterns. ● Use pattern rules to extend patterns and to make predictions. ● Complete patterns where elements are missing. **Values** ● Demonstrate the ability to obtain a rule for a number pattern by determining the relationship between given numbers.	Write **'G'** if the pattern is growing or write **'S'** if the pattern is shrinking.  Retrieved from https://images.google.com/ ● Are students able to use informal language to describe rules for patterns increased and decreased? Present learners with the following  Retrieved from https://images.google.com/ 1. Describe the type of pattern in your own words. 2. Draw the next term (5th figure). ● Are students able to create growing or shrinking patterns? ● Are students able to determine the rule for a pattern that is growing or shrinking?	identify which pattern is an increasing pattern  and which is a decreasing pattern within their school environment or homes. Retrieved from https://images.google.com/ Provide students with the opportunity to determine missing terms in given increasing and decreasing patterns. e.g. 1. 2, 3, 4, 5, __, __ e.g. AB, ABC, ABCD, ABCDE, e.g. 20, 18, 16, 14, ___, ___, ___  Retrieved from: https://www.effortlessmath.com/math-topics/growing-patterns

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	• Can students extend given patterns using concrete materials, or written exercises? **Think, Pair, Share** Students will be provided with markers and a sheet of paper. With their peers, students will create, growing, shrinking and repeating patterns which they will write on paper. Student pairs will then display their pattern and have their classmates determine the rule for each pattern. • Are students able to recognize growing and shrinking patterns around them? • Are pupils able to increase or decrease patterns involving letters, numbers and concrete materials? • Can students increase patterns using geometric shapes? • Are students able to make predictions on the next element to be added or taken out in patterns? Have students look at the pattern then describe what they observe.	 Retrieved from: https://www.megaworkbook.com/general-aptitude/pattern-recognition  Retrieved from https://images.google.com/

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 *Retrieved from https://images.google.com/* Students will use the rule in order to solve for the missing term. **Peer Assessment:** Provide opportunities for small groups or peer conversations on different patterns. After the chat, learners provide their peers with a "Thumbs Up" about something in the conversation the peer expressed well. **Practical tasks** • Can students fill in missing elements in increasing and decreasing patterns? • Are students able to increase patterns using addition? • Can students decrease patterns using subtraction? • Can students identify patterns in a 100 numbers chart? Write the missing values in each red circle.	Allow students to identify and correct errors in given patterns.  Retrieved from: https://www.teacherspayteachers.com/Product/Patterns-Error-Analysis-7358473 Provide students with opportunities to solve and create real life problems involving repeating, growing and shrinking patterns.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 **In Providing Feedback to learners** (consider the following) • Are students able to locate errors in patterns? • Are students able to complete increasing and decreasing patterns concretely and pictorially? • Can students solve simple pattern problems?	 Retrieved from: https://www.megaworkbook.com/general-aptitude/pattern-recognition#growing_pattern_recognition Provide students with concrete and pictorial examples to find the rule, then determine the numbers that will complete each repeating pattern.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		 Retrieved from https://images.google.com/

Useful Content Knowledge for the Teacher about the Outcome:

In growing and shrinking patterns, the number of elements increases or decreases.

Increasing materials can be linked with addition and multiplication. Teachers can use a variety of learning materials to help students build and increase patterns.

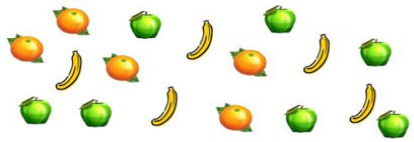
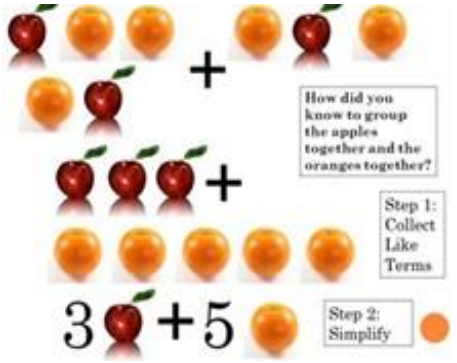
Decreasing patterns, however, can be linked with subtraction and division. Students should be given opportunities to explore growing and shrinking patterns and to formulate rules for patterns. Students should also be encouraged to explain and describe rules used in repeating patterns. In Grade 2 we focus on geometric designs; that is repeating shapes? How do the shapes appear? Are they increasing in number or decreasing?

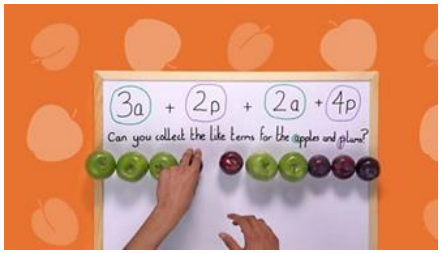
Essential Learning Outcome: Patterns and Relationships 2.1

Introduction to the Subject: Learning about patterns and relationships helps students to make their own predictions and determine missing values by applying an identified rule as well as help them form logical connections. Patterns are important as they provide students with the skills needed to better understand Mathematical concepts. It creates a clearer understanding of relationships and therefore helps improve students' reasoning skills. It forms the basis for the understanding of algebra and allows for quicker problem solving.
Strand (Topic): Patterns and Relationship
Essential Learning Outcomes PR 2.1: Identify when symbols are being used as variables, and describe how they are being used.
Grade Level Expectations: To demonstrate an understanding of the use of symbols in algebraic expressions.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Learners will be expected to: **Knowledge** ● Identify and interpret simple number sentences using words, diagrams and symbols. ● Communicate and interpret simple additive and subtractive strategies using words, diagrams and symbols.	**Gathering information through Teacher Conversation, Observation and Products** ● Can students recognize that a variable may be represented by shapes or objects when finding unknown quantity? **Factor Entrance Slip** Identify and call out the items in the bowl: 2 red apples, a green apple, one banana	● Provide students with real life examples, to create number sentences. For example, reading the menu from two food restaurants as shown below, then place an order with the teacher.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
• Explain how the arrangement of numbers (commutative property) does not affect the sum/total. • Recognize that the commutative property does not apply to subtraction. **Skills** • Represent algebraic expressions using variables and symbols. • Represent unknown quantities concretely, pictorially and numerically. • Simplify algebraic expression problems involving an unknown quantity in an addition and subtraction situation. **Values** • Demonstrate an appreciation for the use of symbols as a substitute for real life objects	 Retrieved from https://images.google.com/ **Think and Share** Using a variety of manipulatives such as fruits, toys, cubes, cars, crayons, pencils etc. students will think of a single letter to represent each object and share with the class. **Group Work** In groups of four, students will look at a menu and pretend what each person would love to order from the menu. The orders will be grouped together and given to the teacher. • Are students able to recognize that unknown quantities can be found by joining or separating quantities given? **Playing Games**	  Retrieved from https://images.google.com/ • Give students opportunities to write number sentences after listening to stories or problems. 1. Count the objects given and represent the number using only the quantity and a letter.  Retrieved from https://images.google.com/ If C stands for cherries, How many C's are there?

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
when counting and grouping items up to a hundred.	Students will play a game called "A Day in the Market." Students will be taken on an organized field trip to the market. When called, they will begin with "In my basket, I have ….. Plus ….. Plus …" ● Are students able to represent missing quantities concretely, pictorially and numerically? **Observation** ● *Concrete.* The learners are given a bag with a variety of manipulatives such as shells, crayons, stones, blocks etc. collected by the students, which they will group and record according to likeness. ● *Symbolic.* Check learners as they group and record their findings as a representation of their work. **Observation** Students are given a worksheet with symbolic quantities to convert into algebraic expressions. **Product Exit Slip** Match the sentence to the algebraic expressions.	2. Organize all like items together and record the number of each item.  Retrieved from https://images.google.com/ 3. Demonstrate an understanding of writing algebraic expression using symbolic quantities.  Retrieved from https://images.google.com/ ● Allow students to represent missing quantities using shapes such as circles, triangles, squares and rectangles etc.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 Retrieved from https://images.google.com/	• Allow students to represent unknowns using drawings and concrete materials. • Give students opportunities to represent unknowns using separating and joining situations. 4. Add the like items and simplify algebraic expressions.  Retrieved from https://images.google.com/ Use appropriate letters to represent the following as simplified algebraic expression • 3 fish + 5 hot dogs + 2 hot dogs + 2 fish • 2 chips + 4 hot dogs + 1 chips • 4 hot dogs - 2 hotdogs

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		5. Simplify these simple algebraic expressions using one operation at a time. ● 2f + f ● h + 4h ● 5a - 2a ● 6b- 4b

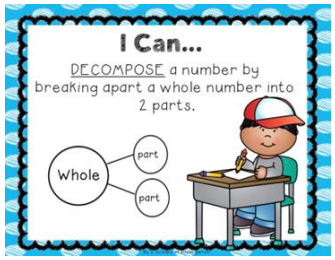
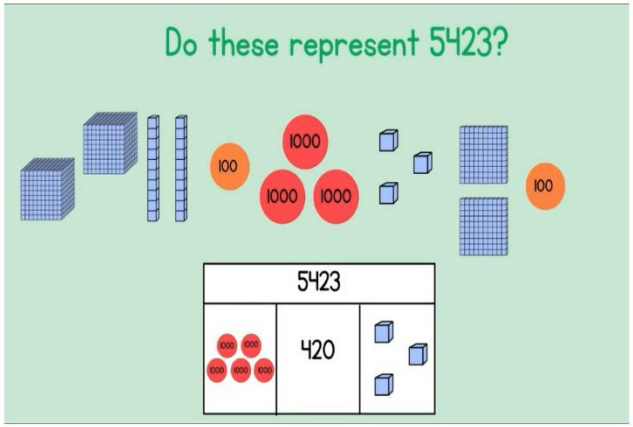
Useful Content Knowledge for the Teacher about the Outcome:

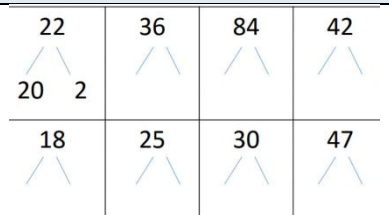
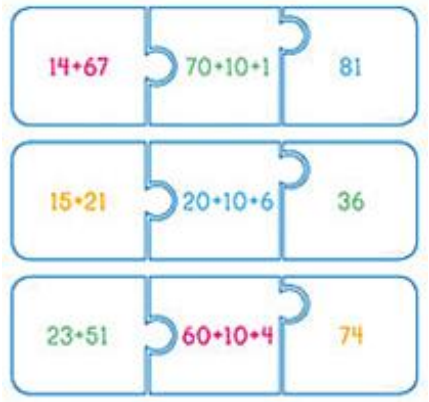
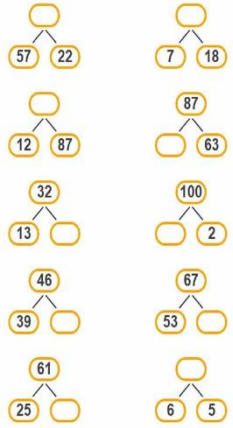
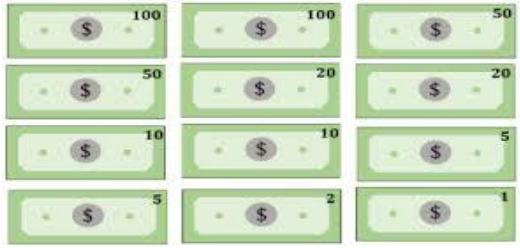
- A variable is any characteristic, number, or quantity that can be measured or counted. Height, age, income, province or country of birth, grades obtained at school and type of housing are all examples of variables.
- An algebraic expression is a set of terms with letters and numbers that are combined using addition (+), subtraction (-), multiplication (x) and division (÷).
- An algebraic equation can be defined as a mathematical statement in which two expressions are set equal to each other.

Essential Learning Outcome: Patterns and Relationships 2.2

Introduction to the Subject: Learning about patterns and relationships helps students to make their own predictions and determine missing values by applying an identified rule as well as help them form logical connections. Patterns are important as they provide students with the skills needed to better understand Mathematical concepts. It creates a clearer understanding of relationships and therefore helps improve students' reasoning skills. It forms the basis for the understanding of algebra and allows for quicker problem solving.
Strand (Topic): Patterns and Relationship
Essential Learning Outcomes PR 2.2: Variables and Relationships - Understanding and representing equivalence.
Grade Level Expectations: Identify and use equivalent relationships for whole numbers up to 100, in various contexts.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Learners will be expected to: **Knowledge** ● Represent numbers up to 100 in a variety of ways. ● Apply the commutative property when add numbers. ● identifying equivalent monetary values of coins and bills.	**Gathering information through Observation and Products** ● Can students recognize that in adding, the order in which numbers are written does not affect the total? e.g. 9 + 16 = 25 16 + 9 = 25 ● Are students able to justify why commutative property does not work for subtraction? ● Can students formulate number sentence to represent scenarios or problems given?	1. Allow students to discover through playing of games that numbers can be represented in a number of ways. E.g. using the ten and five frames to build numbers, or dominoes to represent the same number.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
Skills • Create equivalent sum of money using different coins. **Values** • Generalize whole numbers can be decomposed and composed without changing its value.	**Factor Entrance Slip** Given manipulatives, students will share them in two parts. **Think and Share**  Retrieved from https://images.google.com/ Given a specific number, students will break it into two parts. Students will share their results. Students will record findings by writing a number sentence. **Observation** • *Concrete:* The learners are given a worksheet. which they will complete through decomposition	For example:  Different Ways To Show a Number | Representing Numbers in Different Ways | Place Value | Math 2021 Retrieved from: https://www.youtube.com/watch?v=7-v4ZLaZhw 2. Watch a video on composition of numbers to understand that numbers are made up of other numbers https://youtu.be/zLZNSNj5nVg 3. Provide students with the opportunity to decompose and compose numbers. For example, students will complete the following worksheet by finding the missing amount.

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	 Retrieved from https://images.google.com/ • *Symbolic :* Check learners as they decompose and record their findings. **Games- two-digit decomposed puzzle**  Retrieved from https://images.google.com/	 Another example, have students' real-life example, such as use the denominations (money) to build the following amount. a. $70 b. $7 c. $30  Retrieved from https://images.google.com/

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies:</th><th>Inclusive Learning Strategies:</th></tr>
<tr><td></td><td>Create puzzles which show numbers in expanded form and in decomposed form. Allow students to match them to the corresponding whole numbers.

<u>Group Work</u>

Each group will be provided with a bag of fruit loops cereal as manipulatives. There will be a graphic organizer for each group. Students will need a pencil for writing as needed.

Students will work on their graphic organizer together to come up with different number sentences that utilize the same variables that will be equal to each other in a different order.
Sample graphic organizer

<table><tr><td>A</td><td>+</td><td>B</td><td>=</td><td>B</td><td>+</td><td>A</td></tr><tr><td></td><td>+</td><td></td><td>=</td><td></td><td>+</td><td></td></tr><tr><td></td><td>+</td><td></td><td>=</td><td></td><td>+</td><td></td></tr><tr><td></td><td>+</td><td></td><td>=</td><td></td><td>+</td><td></td></tr><tr><td></td><td>+</td><td></td><td>=</td><td></td><td>+</td><td></td></tr></table></td><td>4. Provide opportunities for learners to demonstrate commutative property by formulating five 2-digit numbers and its commutative property between 40 and 100. For example, use a graphic organizer as shown below.

<table><tr><td>A</td><td>+</td><td>B</td><td>=</td><td>B</td><td>+</td><td>A</td></tr><tr><td></td><td>+</td><td></td><td>=</td><td></td><td>+</td><td></td></tr><tr><td></td><td>+</td><td></td><td>=</td><td></td><td>+</td><td></td></tr><tr><td></td><td>+</td><td></td><td>=</td><td></td><td>+</td><td></td></tr><tr><td></td><td>+</td><td></td><td>=</td><td></td><td>+</td><td></td></tr></table>
Retrieved from https://images.google.com/

5. Have learners view a video on coins and their representation. For example, Counting Coins Song for Kids | Penny, Nickel, Dime, Quarter | 2nd Grade</td></tr>
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies:	Inclusive Learning Strategies:
	Retrieved from https://images.google.com/ **Think and Share** Using pseudo money students will think of ways to repay a debt of $50 using different denominations except for a single $50 note. By a show of hands students share their findings. **Game- Coin Cruncher** Learners will be involved in a two-part interactive game online. 1. Make a total- learners will drag the coins to make the right amount 2. How much - Learners will add the coins and state the amount. **https://natwest.mymoneysense.com/students/students-5-8/coin-cruncher/**	6. Allow students to represent unknowns using drawings and concrete materials. e.g. Cindy picked 40 mangoes and sold some to her friend Jan. Cindy now has 15 mangoes. How many mangoes did she sell to Jan? Which operation should Cindy use to find out how many mangoes she sold to Jan?

Useful Content Knowledge for the Teacher about the Outcome:

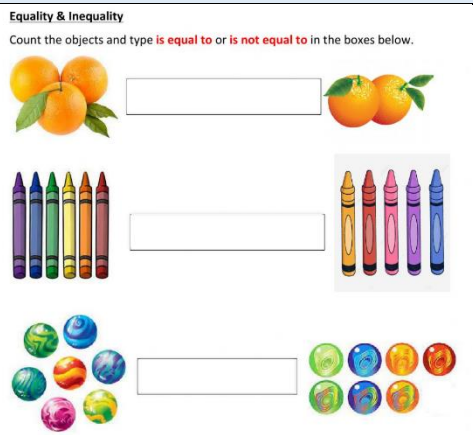
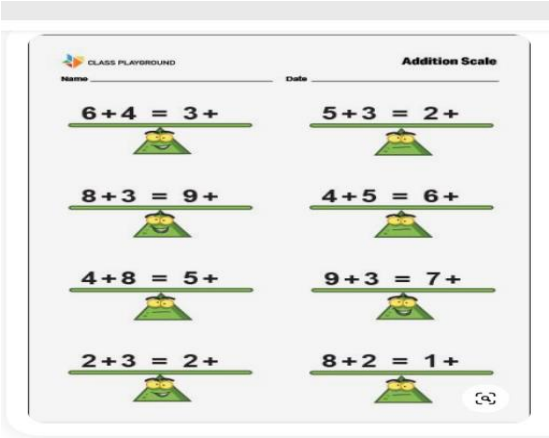
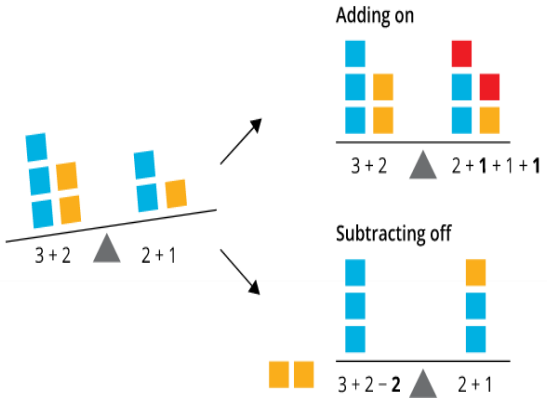
When numbers are decomposed, the sum of the parts is equivalent to the whole.
The same whole can result from different parts.

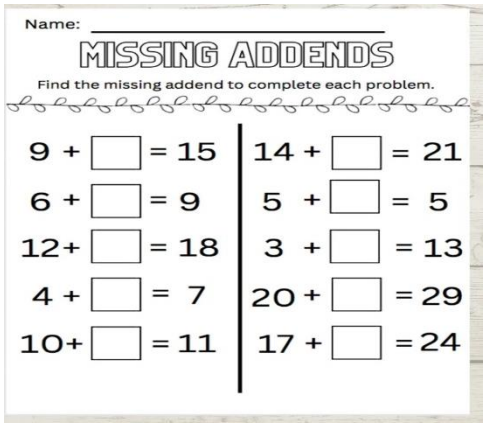
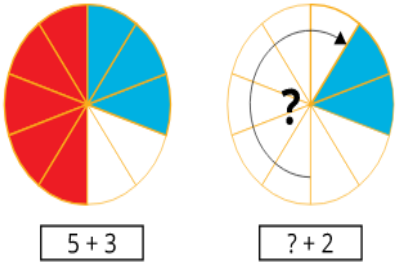
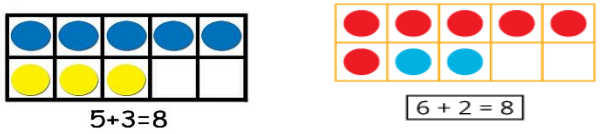
Note: Many mathematical concepts are based on an underlying principle of equivalency.
The commutative and associative properties of addition are founded on equivalency.

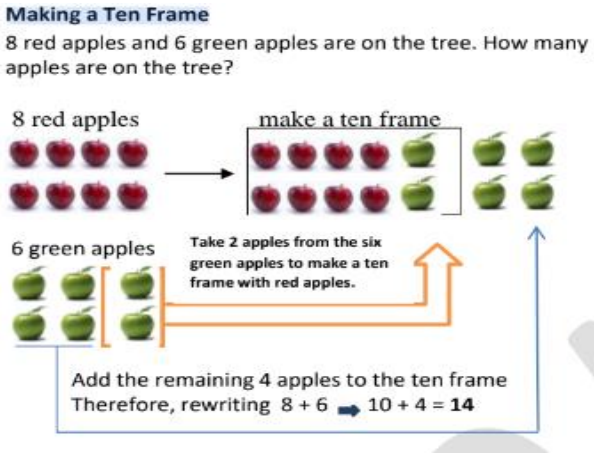
Essential Learning Outcome: Patterns and Relationships 2.3

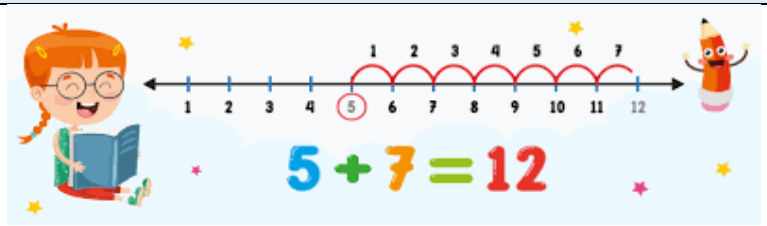
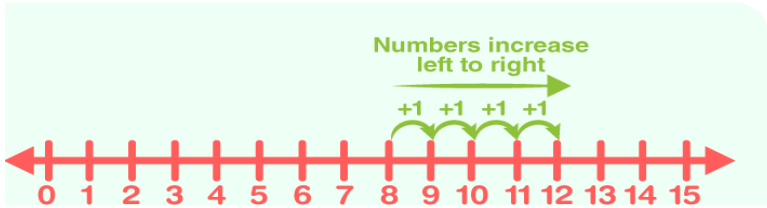
Introduction to the Subject: Learning about patterns and relationships helps students to make their own predictions and determine missing values by applying an identified rule as well as helping them to form logical connections. Patterns are important as they provide students with the skills needed to better understand Mathematical concepts. It creates a clearer understanding of relationships and therefore helps improve students' reasoning skills. It forms the basis for the understanding of algebra and allows for quicker problem solving.
Strand (Topic): Patterns and Relationships
Essential Learning Outcomes PR 2.3: Variables and Relationships - Writing Expressions and Equations
Grade Level Expectations: Learners will determine what needs to be added to or subtracted from addition and subtraction expressions to make them equivalent.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Learners will be expected to: **Knowledge** ● Demonstrate and explain what equality means using manipulatives and diagrams (0-100). ● Record equalities and inequalities symbolically using the correct symbol.	**<u>Gathering information through Observation and Products</u>** **Observation** Observe as students form equal amounts using the scale. Have students use manipulatives and discuss reasoning for choosing the answers given. *Symbolic* **Pair activity** In pairs students complete worksheet using hands on material.	1. Teacher guides students into the story of a class which wanted to form equal teams for a football game. Discuss the meaning of the word equal. The students explore using equal numbers for the teams and later uses a seesaw to look at equal weight. Discuss that the objects must be the same number and weight to balance off. Have students view YouTube Video on Balancing off- https://youtu.be/C6tNqKdA6aI 2. **Equal or Not Equal**: Group the class into small groups. Each group needs a balance scale and a set of number sentences/equations. Have each group use the

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
• Solve for missing quantities to make the equation equivalent. **Skills** • Model equalities using a variety of concrete representation and record. **Values** • Appreciate the need for equating an expression to values. • Accept that an equation is a number sentence.	 Retrieved from https://images.google.com/  Retrieved from https://images.google.com/	balance scale and a set of cube or counters to determine whether the number sentences are equal or not equal. 1. 4+5= 9 2. 10 = 4 + 6 3. 12 + 4= 13 + 2 3. **Using a Balance off Model** • Provide opportunities for students to use pan balance to investigate and represent equivalent sets.  Retrieved from https://images.google.com/ 4. **Using Sectioned Circles** Allow students to shade pieces in the second circle to make it equivalent to the first. Students will then fill in the missing values.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Concrete : Given manipulatives allow students to complete:  Name: _____ MISSING ADDENDS Find the missing addend to complete each problem. 9 + ☐ = 15 | 14 + ☐ = 21 6 + ☐ = 9 | 5 + ☐ = 5 12+ ☐ = 18 | 3 + ☐ = 13 4 + ☐ = 7 | 20 + ☐ = 29 10+ ☐ = 11 | 17 + ☐ = 24 Retrieved from https://images.google.com/	 5 + 3 ? + 2 Retrieved from https://images.google.com/ 6. **Provide students with Ten Frames to model equality.**  5+3=8 6 + 2 = 8

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		Retrieved from https://images.google.com/  Retrieved from https://images.google.com/ 7. Provide students with the opportunity to use a double number line to show equality/inequality. Example: Show that 5 + 7 = 8 + 4.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		  Retrieved from https://images.google.com/

Useful Content Knowledge for the Teacher about the Outcome:

Key concepts

- The equal sign (=) is a symbol used to indicate that two numerical expressions are equivalent when they produce the same result. The equal sign with a slash through it (≠) is used to indicate that two numerical expressions are not equivalent when they do not produce the same results.
- **These are the important signs to know.**

= When two values are equal we use the 'equals' sign

< When one value is smaller than another we use the 'less than' sign

> When one value is greater than another we use the 'greater than' sign

When using a balance model or balance scale, the weights on the scale are adjusted until the scale is level and the representations of the addition or subtraction expressions are adjusted until there is an identical representation on both sides of the balance.

Inclusive Resources and Materials from Regional Specialists

-mathematical shapes
-numbers
-coloured beads and paper
-pictures
-objects
-fabrics
-number lines and hundred chart

Additional Resources and Materials

Worksheet on Balancing off Approach -https://www.twinkl.com/resource/t-n-2545704-ks1-balancing-act-addition-activity-sheet
Balancing The Equation using Ten Frames YouTubeVideo-https://youtu.be/KmVby8vviE8
Demonstration of how to form simple color patterns: https://www.youtube.com/watch?v=P0BDrPoF01M

Read aloud book on Repeating Patterns entitled Pitter Pattern by Joyce Hesselberth
https://www.youtube.com/watch?v=BhlPCnaVrmQ

Math Story about children on a visit to a land where patterns grow
https://www.youtube.com/watch?v=67uypjAlTDw

Geometric Patterns Worksheet-
YouTube Video :https://youtu.be/V3MIHuLZzTE

- Text books Bright Sparks Student Bk 2 Pg:
  Oxford Primary Mathematics Bk 2 Pg
- Worksheets
- Manipulatives such as fruits, toys, crayons, shells, etc.
- Recommended Text, Worksheets

- Items in the environment or those that can be found at home.
- Splashlearn.com , YouTube, quizziz and other online learning apps.
- Interactive games, manipulatives such as cubes, counters and any other items that can be used for counting Pseudo money.

Opportunities for Subject Integration:
Science- Discuss -seesaw balance when the weight on both sides are equal.
Science- Use of fruits and vegetables.

Social Studies - Have students discuss equality and inequalities at home and at school.
Social Studies- family (total number of family is not those in the home but all inclusive). Example learners may have 8 siblings but 5 are at home and 3 away but the fact remains that they still have 8 siblings.
Social Science: Students will show an appreciation for different or diverse cultures.
Social Studies : Many flags of countries have patterns

Retrieved from https://images.google.com/

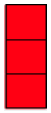
Arts and Craft- Allow students to draw diagrams to represent balance equations.
Arts and Crafts: Students will create their own patten wall as a class or individually.
English- Listening comprehensions, reading menus.
English- Terms such as decompose, compose, equivalent etc. can be added as part of their vocabulary.
Language Arts: Students read stories and dramatize balancing off approach -https://freekidsbooks.org/one-two-fun-story-sharing-equal-parts/

Language Arts: Stories such as the Little Red Hen, The Big Turnip and Henny Penny follow a pattern by introducing one character at a time then repeating.

Poetry: Have students recite the poem There Was an Old Lady Who Swallowed a Fly by Michael Twinn
Ask students to describe what is happening in the story/song (the number of animals swallowed increases by one each time).
Reread the poem and represent the pattern in the poem using unifix cubes or colour tiles.

Example: There was an old lady who swallowed a fly . . . 

There was an old lady who swallowed a spider . . . 

There was an old lady who swallowed a bird . . . 

Physical Education: Exercise Your Pattern
https://www.youtube.com/watch?v=aXsBfGg0DxE

HFLE- Discuss equality, the rights of every individual to have equal rights and opportunities.

Elements from Local Culture:

- Use of vintage shop scale or seesaw to show balance.
- The food that we eat, how and when we eat, follow a pattern.
- The leaves of certain trees follow a pattern.
- The weather follows a pattern.
- How fruit trees bear, follow a pattern. Some trees bear based on seasonal patterns.
- Patterns on Carpets, mats, wall paintings.
- Local items that can be found in the market.

Resources for a learner who is struggling: *Worksheets* - **https://www.k5learning.com/blog/equal-greater-or-less**
https://superstarworksheets.com/wp-content/uploads/2021/08/more-2.jpg
https://kikkibikki.com/math-free-preschool-kindergarten-worksheets-equal-or-not-equal/#!free-kindergarten-printable-worksheets9379-9394

- Include more hands-on materials and use smaller numbers. Individual attention to those struggling whilst the more advanced are given more autonomy in their work. Also, peer tutoring should be encouraged.
- The teacher/peer along with a struggling student work together to form simple colour, number or shape patterns; each of you contributing to developing one pattern at a time : taking turns in doing so)
- Students who are struggling will be given more manipulatives to use along with worksheets using smaller figures.

Resources for a learner who needs challenge: *Worksheets*
https://www.math-salamanders.com/balancing-math-equations.htmlhttps://www.math-salamanders.com/balancing-math-equations.html
https://www.commoncoresheets.com/numeric-mixed-style/149/download?version=1

- Incorporate problem solving questions in their evaluations.
- Use them as peer tutors in the class.
- Increase the level of difficulty to these learners.
- Students who are more advanced will be moved from concrete to abstract and given simple problems to write in algebraic expressions.

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

- Relate patterns to construction sites and TVET careers such as carpentry, masonry, tailoring, baking, cake decorating etc.

Essential Learning Outcome: Geometrical Thinking 1.1

Introduction to the Subject:
Young children first begin forming concepts of shape long before any formal schooling is introduced. They are able to recognize and describe objects by their appearance or by qualities; so we hear them refer to a ball as 'a circle' or 'the box looks like a rectangle'. All children's informal introduction and understanding of shapes should be facilitated through hands-on explorations, investigations and certainly discussions of these shapes and their structures. Children need to compare, take apart and sort objects based on their attributes as they engage in structured and unstructured play. Children need to see the relevance of what they are learning about geometry as they interact with these objects in the natural environment. Their spatial awareness and geometrical thinking is stimulated/triggered through their constant exploring, analyzing, describing and investigating structures of concrete objects, shapes and space.
The focus of geometry at the grade 2 level is in aiding learners to explore shapes and their attributes and developing spatial relationships.

Strand (Topic): Geometrical Thinking

Essential Learning Outcomes: Exploring and Analyzing Geometric Shapes and Relationships- ***Developing Spatial Sense***

Grade Level Expectations:

- Use language that describes shapes, objects, and space orally and in writing to describe a picture or object in real world contexts or an object undergoing a transformation.
- Use gestures that aid in the understanding and communication of a description.
- Use positional language.
- Find 2D shapes or paths hidden in a picture or space (2D shapes within 3D solids).
- Recognize a shape or object seen from various points of view and from various distances (2D shapes and 3D objects in various positions in space).
- Draw a picture from a description and vice versa about 3D objects in pictures or in real world context).
- Draw, build and make predictions about 2D shapes and 3D objects in pictures or in a real world context and 2D shapes undergoing a transformation.
- Build a model from a picture or description of 3D objects in pictures or in a real world context.
- Make predictions based on spatial reasoning about what 2D shapes can be created by the footprints of 3D solids and predict what shape is being described prior to building a model.

Key Skills: construct, classify, justify, compare, analyze, represent, organize, observe

Concepts: 2-Dimensional shapes, 3-Dimensional shapes, transformations

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

Knowledge

1. Describe orally and written, 2-D and 3-D shapes and/or objects and space.
2. Identify 2-D and 3-D shapes in the environment.
3. Explain the differences and similarities between and among 2-D shapes using vocabulary associated with properties of shapes.
4. Make comparisons between solids and plane shapes in concrete and pictorial forms using formal language.
5. Identify 2-D shapes as faces of 3-D shapes in pictures, objects or space from different orientations.
6. Classify shapes according to their properties/features and give reasons for the classification.
7. Create/build 2-D and 3-D shapes.
8. Describe 2-D and 3-D shapes found in the natural environment or in pictures.
9. Create 3D shapes using 2D shapes from a description given within a real world context.

Values
</td>
<td>

Observation Checklist

As students sort the items, teacher will monitor students' conversations and interactions with the objects and record observations using the following observation checklist, then an exit slip will be completed as well:

<table>
<tr><th>Criteria</th><th>Yes</th><th>No</th></tr>
<tr><td>- Can the students sort the items using a selected criterion?</td><td></td><td></td></tr>
<tr><td>- Can the students describe the attributes of the 2D or 3D objects observed based on the selected criteria (number of sides, vertices, number of faces, edges, etc.)?</td><td></td><td></td></tr>
<tr><td>- Did students work together collaboratively?</td><td></td><td></td></tr>
</table>

Additional Comments:_____

Exit Slip

Given the description of a shape, students will identify the shape…example. 1 curved surface and 1 flat surface: cone

SCO 2
Journal
</td>
<td>

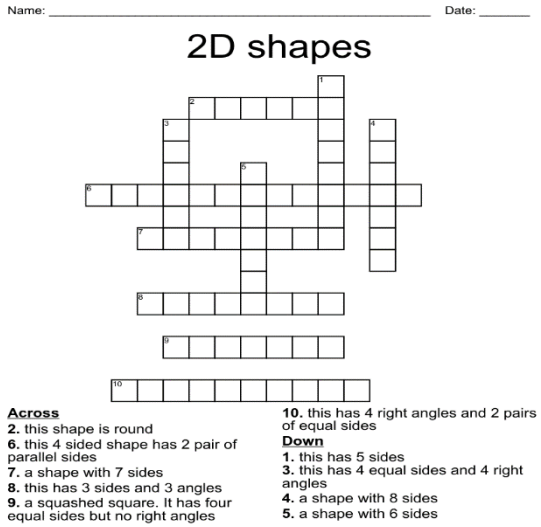
Group Work

Place a collection of 2D and/or 3D shapes and or objects on tables for students. In groups, students will decide on the sorting criteria and sort the items accordingly (all cubes together, all cylinders together, etc.). When each group has completed the task, students will rotate around the class visiting the remaining groups and decide on the sorting criteria. A general class discussion will be held after each group has gone through the other groups.

SCO 2
Scavenger Hunt

Engage Students on a scavenger hunt around the school to identify 2D and/or 3 D objects and items found in the school environment. Students will record their findings using a given template or a table with shape headings (cube, cylinder, cone, square, circle, etc.).

Or
Engage students in a shape hunt at home and bring in objects reflecting 3D and 2D shapes/objects from home. Students will set up a shape corner with their exhibits with given labels to categorize those shapes.
</td>
</tr>
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
10. Show an awareness of the properties of 2-D and 3-D shapes in the environment through explorations of multimedia games, toys, props, puzzles, worksheets and songs. 11. Investigate and reason about the results of transforming 2-D shapes using the appropriate vocabulary (flipping, turning). **Skills** 12. Identify and describe the position of 2-D and 3-D shapes in relation to another shape, object or space.	Students will record in their journal by writing or drawing, how they felt about completing the scavenger hunt task or shape hunt using the following prompt: **Draw or stick a picture or write one thing that shows what you learnt from the activity**. **Crossword Puzzle** Students will complete a crossword puzzle with descriptive prompts for 2D and or 3D shapes.  Name: _____ Date: _____ 2D shapes **Across** **2.** this shape is round **6.** this 4 sided shape has 2 pair of parallel sides **7.** a shape with 7 sides **8.** this has 3 sides and 3 angles **9.** a squashed square. It has four equal sides but no right angles **10.** this has 4 right angles and 2 pairs of equal sides **Down** **1.** this has 5 sides **3.** this has 4 equal sides and 4 right angles **4.** a shape with 8 sides **5.** a shape with 6 sides https://wordmint.com/public_puzzles/483814 **SCO 7** **Rubric**	 https://www.pinterest.co.uk/pin/129689664252231905/ **SCO 3 and 5** Provide Students with the opportunity to describe 2D and 3D shapes.

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr>
<td></td>
<td>
A rubric will be used to assess students as they create their 2D and 3D shapes and their justified descriptions.
<table>
<tr><td>Wow!</td><td>Goes far beyond the task; gives great detail about 2D and 3D shapes, uses appropriate expression and model matches the description of the shape.</td></tr>
<tr><td>Spot on!</td><td>Completes the task, shows understanding of 2D and or 3D shapes, meets the requirement and is accurate.</td></tr>
<tr><td>Moving Along</td><td>Shows understanding of 2D and 3D shapes but makes errors, work misses details, expression is lacking, a work in progress.</td></tr>
<tr><td>Getting there, not yet!</td><td>Lacks understanding, does not address the criteria for the task, model created is</td></tr>
</table>
</td>
<td>
It looks like a …..
Students will complete a table with the following prompts for 2D and or 3D shape samples presented to them, using words or pictures:
<table>
<tr><th>Shapes</th><th>What do I see</th><th>It looks like a……</th></tr>
<tr><td>Square</td><td>4 sides with equal lengths</td><td> 
the face of a die
 
a tile on a floor</td></tr>
<tr><td>circle</td><td></td><td></td></tr>
<tr><td>pentagon</td><td></td><td></td></tr>
<tr><td>hexagon</td><td></td><td></td></tr>
<tr><td>octagon</td><td></td><td></td></tr>
</table>
SCO 7
</td>
</tr>
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	inappropriate, needs intervention.	**Shape Creation** Provide opportunities for students to create models of 2D and 3D shapes. For example, give students match sticks, popsicle sticks or other uniform objects to create 2D and 3D shapes. Allow students to present their creations and give reason for descriptions. Example: I used 4 sticks, therefore, it is a square.  I used 6 sticks, therefore it is a hexagon. I used 5 sticks, therefore it is a pentagon.
	SCO 8 **Oral Assessment** Students will dip in a bag, select a picture of a shape or the shape name and engage in a round the class oral discourse entitled: "I am a _____because" (e.g. I am a cube because I have 6 square faces, 12 edges and 8 vertices)	
	SCO 9 **BINGO** In groups, students will play shape BINGO. A descriptive piece will be read to them and based on the 3D description, a peg/counter will be placed on the correct shape or word. The first group to fill out the word BINGO wins. Teacher will monitor students progress as the activity is done.	**SCO 8** **Picture Shapes** Allow students to make real-life connections of 2D and 3D shapes by describing shape in the environment. For example, present students with multiple scenarios with pictures where they are to identify the 2D and 3D shapes embedded in those pictures and give reason for selection of those shapes.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		 https://www.vectorstock.com/royalty-free-vector/street-with-buildings-and-cars-on-roads-vector-27817033  https://stock.adobe.com/images/delivery-of-concrete-blocks-to-a-construction-site/382816416?as_campaign=ftmigration2&as_channel=dpcft&as_campclass=brand&as_source=ft_

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		web&as_camptype=acquisition&as_audience=users&as_content=closure_asset-detail-page or Give students photos of objects or take them on walks through the community and identify the 2D and 3D shapes embedded in those objects. Engage students in discussion on the usefulness of those shapes for those items and share with the class.  https://www.cars.com/research/compare/ https://www.freepik.com/premium-vector/semi-trailer-truck-detailed-realistic-vector-illustration_17104506.htm  https://www.lekkerbikes.us/products/amsterdam-commuter-bike

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		SCO 9 Provide students with the opportunity to make comparisons and explore 2D and 3D shapes. For example**:** Students are presented with riddles reflecting characteristics of 3D shapes, and are to use 2D shapes to create 3D objects or shapes. Example: - I am a concrete block used in construction with 6 rectangular faces. (cuboid) - You lick ice-cream off me on a hot sunny day. (cone) - You roll me as a die when you play board games. (cube) or Students who have difficulty visualising the read riddles, objects reflecting the descriptors of the 3D objects will be placed in a pool of shapes for them to select, or an assistive device on the computer can be used to help them create the shapes.

Useful Content Knowledge for the Teacher about the Outcome:

What is geometry
Realistic Nature of Geometry
2-Dimensional shapes
3-Dimensional shapes
Composite shapes
Perspective

Vocabulary:

shape squares circle triangle rectangle sides corners straight faces polygons pentagon hexagon octagon flat solid curved point edges 2-dimension 3-dimension vertex/vertices base footprints rolls slides composite shapes shadows slicing transformations position model tangrams geoboard objects

Inclusive Resources and Materials from Regional Specialists

Additional Resources and Materials

Geoboards
Rubber bands
Tangrams
Pattern blocks (hands on and virtual blocks)
Craft sticks, matchsticks

Literature/Books:

- Shape Transformer by Zakary Zormer
- If you Were a Polygon by Marcie Aboff
- Icky Bug Shapes by Jerry Palotta
- Shapes that Roll by Karen Bagel
- Ship Shapes by Stella Blackstone
- Circus Shapes by Stuart Murphy
- The Greedy Triangle by Marilyn Burns
- Mummy Math:An Adventure in Geometry by Cindy Neuschwander

Websites

- www.abcmouse.com
- www.ixl.com
- www.thebutterflyteacher.com
- www.thecurriculumcorner.com
- https://k5mathspot.com/4-geometry-activities-for-2nd-grade-learners-who-love-to-move/
- https://saddleupfor2ndgrade.com/2d-shapes-activities/
- https://www.prodigygame.com/main-en/blog/geometry-activities/
- https://wordwall.net/resource/24902801/science/3d-shapes-quiz
- https://wordwall.net/resource/30575577/maths/2-d-shapes

Opportunities for Subject Integration:

Art and Craft

- Use of tangrams to create 2-D shapes.
- Drawing or painting representations of 2-D and 3-D shapes.
- Create models of 3-D shapes.
- Combine shapes to create patterns.
- Create mobiles in the class to represent 2-D and 3-D shapes.
- Shape parade using costumes made from 2-D and 3-D shapes.
- collect items in the environment to create a collage or a 3-D model of an object.

Science

- Forces; 3-D shapes that can be pulled, pushed, lifted, slide.
- Emphasize "Reduce, Reuse, Recycle", by using items found in the environment to create 2 and 3-D models.

Social Studies

- Project on My Community; create building models to represent those found in their communities.
- Build 3-D models of natural landscape features in the environment, example, hills, peninsula, mountains.

Music

- Create musical instruments using 3D objects found in the environment.

Language Arts

- Use of picture books to relay stories relating to 2 and 3-D shapes.
- Spelling the names of 2 and 3-D shapes.
- Use of the vocabulary for 2 and 3D shapes in sentences/in context, orally and written.
- Completing puzzles to match the shape to its meaning.
- Create poems and rhymes on 2 and 3-D shapes.

Physical Education

- Use human formations to create representations of 2 and 3-D shapes

Elements from Local Culture:

- Construction sites
- Churches, schools
- Architects and contractors

Essential Learning Outcome: Geometrical Thinking 1.2

Introduction to the Subject:
Geometry is important to learn as it creates a foundation for learning other concepts in Mathematics and can be used in other subject areas. As learners explore the topic of Geometry, the primary goal is to provide experiences to help them develop spatial sense and geometric thinking. Spatial sense serves as a sixth sense about shapes and the relationships among them while geometric thinking refers to how learners think about geometric ideas. Van Hiele, in his theory, describes five levels of geometric thought. Progression onto another level is highly dependent on the acquisition of the previous. As a result, learning about the topic becomes critical. In this Essential Learning Outcome, as learners explore the shapes and relationships, the activities presented are geared to helping them to experience the topic in a manner that will foster the development of the main frameworks in geometry (spatial sense and geometric thinking) and ensure that they also have fun learning. Learners will also gain an appreciation of the topic.

Strand (Topic): Geometrical Thinking

Essential Learning Outcomes: Exploring and Analyzing Geometric Shapes and Relationships - Sorting, patterning, and building with 2D and 3D Shapes.

Grade Level Expectations:

- Recognize, name, represent, construct, and justify shapes (specifically circles, squares, rectangles, triangles, pentagons, hexagons, octagons) and 3D objects (prisms, pyramids, cubes, cones, cylinders, spheres).
- Replicate and construct composite 2D shapes (using aforementioned shapes to build composite shapes) and 3D objects.
- Compare the characteristics of shapes or objects (number of sides, number of corners).
- Sort and pattern with 2D shapes and 3D objects according to attributes and characteristics.
- Consolidate properties and names of shapes: Polygons: square, rectangle, triangle, hexagon, pentagon, octagon; 3-D objects: cube, cone, cylinder, sphere, Prisms, and pyramids.

Key Skill: Sorting, patterning, and building with 2D and 3D shapes

<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:

Knowledge:
- Identify 2D shapes on 3D objects.

Skill:
- Represent and construct 2D shapes and 3D objects.

- Sort 2D shapes and 3D objects based on their attributes and characteristics.

- Sole repeating patterns using/involving 2D shapes and 3D objects.

- Create repeating patterns using/ involving 2D shapes and 3D objects.

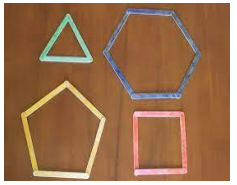
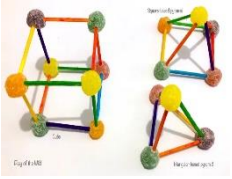
- Build composite shapes/structures of 2D and 3D shapes and describe the pattern used.
Value:
- Choose to use 2D shapes to create 3D models using pictorial and physical representations.</td>
<td>Think - Pair - Share
Listen to learners as they describe shapes and observe them as they classify the various 2D shapes and 3D objects.
Use a checklist to monitor learners' behaviours below:

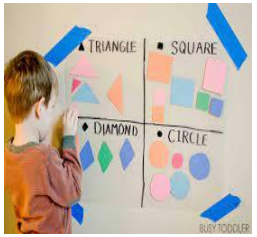
<table>
<tr><th rowspan="2">Behaviour/Skill</th><th colspan="3">Competence</th></tr>
<tr><th>E</th><th>S</th><th>I</th></tr>
<tr><td>❖ Names the 2D or 3D shape.
❖ States examples of 2D and 3D shapes.
❖ Identifies properties of the 2D and 3D shapes.</td><td></td><td></td><td></td></tr>
</table>
E - Excellent S - Satisfactory I - Needs Improvement

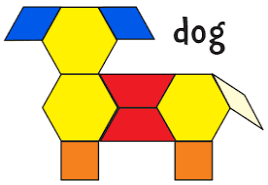
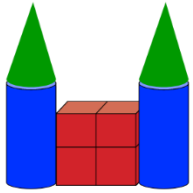
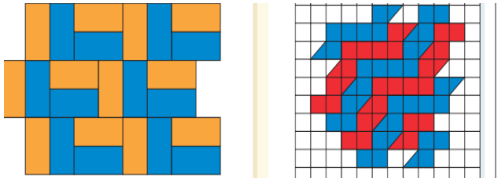
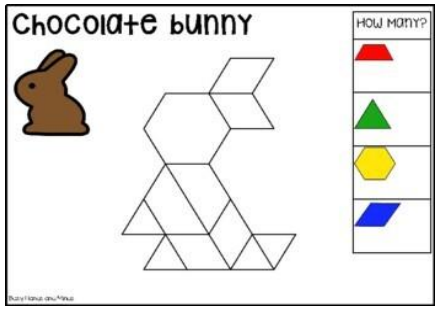
Observation:
Observe learners as they construct using different shapes, and pay attention to the choice of materials used. Listen as learners share ideas about what they have constructed. Can learners describe the process involved in completing their creation?

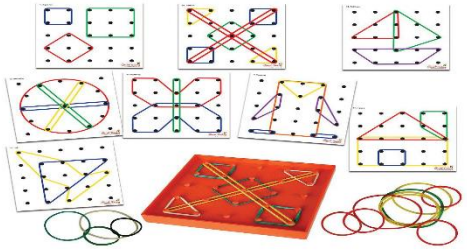
Product: Individual or Group work</td>
<td>Provide learners with opportunities to identify, describe and classify 2D shapes and 3D objects using concrete objects, diagrams and pictures (using examples and non examples). Learners will also discuss and share ideas about the different shapes they encounter.
Example: Learners are given a picture(s) of a representation of a triangle
Some questions for discussion include:
1. What do you notice about the shape?
2. What type of shape is this?
3. Does the shape have straight sides?
4. How many sides?
5. Have you seen other shapes like this? Can you name them?

Have learners construct 2D shapes and 3D objects using different materials such as popsicle sticks, straws, elastic bands on geoboards, modelling clay and playdough. Learners share ideas about the shape they have constructed.

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

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Observe learners as they classify 2D shapes and 3D objects using materials provided to them. Question learners about reasons for the classifications. Learners can also be presented with a worksheet to classify shapes and use a colour code for similar shapes.  (google images) **Individual or Group work:** Have learners complete or construct repeating patterns in groups or individually. Learners can be given one or two shapes. Question learners about the patterns they have completed or constructed, and the rule used for generating the pattern. Record students' responses as they are observed. Example: Allow students to display/ showcase and explain the patterns that they have created.	(google images) Allow learners to identify, classify and draw shapes with similar properties in varied sizes and different orientations. Give learners materials such as cut-outs or pictures of 2D shapes and 3D objects and allow them to sort them out. Learners can also use a colour code for the pictures.   (google images) Provide learners with opportunities to complete and construct repeating patterns using 2D shapes (tessellations). Use paper cut outs of various shapes or pictures to create/start a pattern and allow learners to complete the pattern. Use the game of 'Show and Tell'. Give learners cut-out or pictures to create and show their own patterns and allow them to talk about the rule or pattern they created.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Product: Individual or Group Work Have learners create pictures/structures using 2D shapes and 3D objects and explain the shapes and combinations used in their pictures/structures. Display learners' creations and outlines they have completed.   house (google images) I made a dog. I used … I made a house. I used … Distribute work cards where learners are given the outline of shapes and they will use a combination of shapes to cover the outline. or Learners can be given exit cards that contain an outline of a shape and they will have to determine the combination of shapes used to make the outline.	 (Elementary and Middle School Mathematics pg. 451) Have learners explore ways of covering surfaces to build pictures/structures using 2D shapes and 3D objects. Allow learners to explore with tangrams. Give the learners puzzles where they can outline pictures/shapes using materials such as tangrams pieces, attribute blocks, pentominoes and/or pattern blocks.  (google images) Have learners record and talk about their exploration of building their own pictures/

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		structures using various materials, for example, geoboards and elastic bands to make a house. Learners are allowed to explore their creativity as they work with the materials.  (google images)

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: 2D means two-dimensional, they are also known as plane shapes.
Examples include circles, polygons: triangles, quadrilaterals, pentagons, and hexagons.
There are regular and irregular polygons.
2D shapes have sides and angles (angles are formed where two sides meet).

3D objects/shapes: 3D means three-dimensional, they are also known as solids.
Examples include cylinders, cubes, spheres, cones, prisms, and pyramids.
There are variations of prisms: triangular prisms, rectangular prisms, and pentagonal prisms.
There are variations of pyramids: tetrahedron, square-based pyramid, pentagonal-based pyramid, and hexagonal-based pyramid.
3D objects/shapes have faces, edges and vertices.

Inclusive Resources and Materials from Regional Specialists

- tangrams
- pattern blocks
- concrete materials (cut-outs, straws, play dough, modelling clay, popsicle sticks, stickers, coloured paper)
- pentominoes
- attribute blocks
- puzzle blocks
- geo boards
- model of 3D shapes
- pictures of shapes

Additional Resources and Materials

Burns, Marilyn: *The Greedy Triangle*
Grifalconi, Ann: *The Village of Round and Square Houses*
Hoban, Tana: *Cubes, Cones, Cylinders and Spheres*
Maccarone, Grace: *Three Pigs, One Wolf and Seven Magic Shapes*
Neuschwander, Cindy: *Mummy Math- An Adventure in Geometry*
Shaw, Charles G: *It Looked Like Spilt Milk*

Appropriate Vocabulary

- 2D shapes: 2 dimensional shapes, plane shapes, sides, angles
- 3D shapes: 3 dimensional shapes, solids, faces, vertices, edges
- tessellations: tiling of a plane/grid using one or more shapes in a repeated pattern

Opportunities for Subject Integration: *(How the inclusive learning strategies might be adapted and/or applied to include other subjects in the curriculum)*
Language Arts: Vocabulary associated with 2 D and 3D shapes and objects.
Names of 2D and 3D shapes and brief descriptions and/or definitions.

Language Arts: Reading and Comprehension
Learn key words, name pictures and read short descriptions of shapes.
Use clues (descriptions of shapes) and students present a visual representation or write/state the name of shape for each clue.

Language Arts: Writing
Write 1-2 descriptive sentences for 2D shapes and 3D objects.

Write imaginative stories where the shapes are the characters.

Art and Craft
Draw the shapes in different orientations.
Use materials to make representations of the shapes.

General Science
Science Skill: Classifying/Sorting: Classify/sort 3D objects and 2D shapes.
My Environment: Associate the things in the environment with the shapes.
My Body: Shapes can be used to make an outline of the body and labelled.
Phases of the moon: crescent moon, full moon, gibbous etc.

Games and Folk dances have moves and patterns that are done with shapes like circles, triangles and squares.

Elements from Local Culture: *(References that learners might know from their local environment*
Shapes all around us: Learners can identify shapes in the classroom, at home, in the playground, in the community etc.

- Classroom: furniture, board, books, pencils, chalk, duster, crayons, markers
- At Home: appliances, furniture, dishes, grocery items (cans, cereal boxes)
- In the playground: balls, cones, poles, wickets
- In the community: buildings, roofs, windows, trash cans/bins, utility poles, road signs

Resources for a learner who is struggling: *(Links to earlier learning activities for similar knowledge, links to resources for special education needs)*
www.mathgames.com
www.geogebra.org
www.mathplanet.com
www.KhanAcademy.org
https://www.ixl.com

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
www.ByteLearn.com

Essential Learning Outcome: Geometrical Thinking 2.1

Introduction to the Subject:
Young children first begin forming concepts of shape long before any formal schooling is introduced. They are able to recognize and describe objects by their appearance or by qualities; so we hear them refer to a ball as 'a circle' or 'the box looks like a rectangle'. All children's informal introduction and understanding of shapes should be facilitated through hands-on explorations, investigations and certainly discussions of these shapes and their structures. Children need to compare, take apart and sort objects based on their attributes as they engage in structured and unstructured play. Children need to see the relevance of what they are learning about geometry as they interact with these objects in the natural environment. Their spatial awareness and geometrical thinking is stimulated/triggered through their constant exploring, analyzing, describing and investigating structures of concrete objects, shapes and space.
The focus of geometry at the grade 2 level is in aiding learners explore shapes and their attributes and developing spatial relationships.

Strand (Topic): GEOMETRY

Essential Learning Outcomes:
Recognizing, Naming and Describing Shapes - Analyzing and describing shapes

Grade Level Expectations:

- Recognize and describe attributes and characteristics of 2D shapes (number of sides, number of corners, straight sides, curved sides) and 3D objects (number of edges, corners, rolls or slides, flat sides or curved sides, uniform thickness or not (coming to a point, curved all around).
- Classify two-dimensional figures as polygons or non-polygons.

Key Skills: representing, analyzing, inferring, justifying, reasoning

Key Concepts: 2D shapes, 3D shapes, polygons, non-polygons

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr>
<td>Learners should be able to:
Knowledge

1. Identify properties of 2D shapes.

2. Justify classification of 2D shapes according to attributes.

3. Identify similarities and differences between 2D shapes based on attributes such as sides or corners.

4. Identify similarities and differences between 3D objects based on attributes such as sides, edges, rolls/slides, uniform thickness or not.

5. Classify 2D shapes as polygons or non-polygons.

Skills

6. Compare 2-D shapes in the environment.</td>
<td>(SCO # 1, 2, 3, 5)
<u>OBSERVATION CHECKLIST</u>

As learners make use of geoboards and tangrams, the following checklist will be used.

<table>
<tr><th></th><th>Correct</th><th>Partly Correct</th><th>Incorrect</th></tr>
<tr><td>Learner is able to:

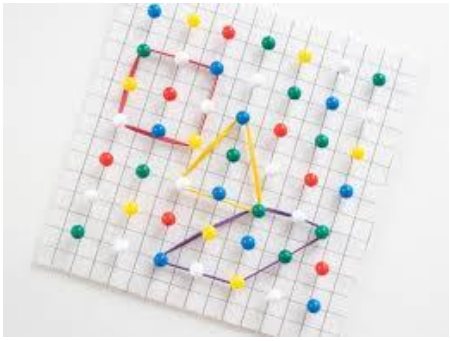
1.Form 2D shapes using elastic bands.

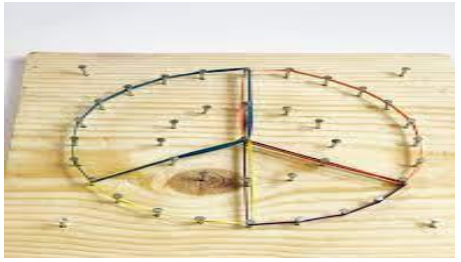
2. Identify and form polygons using 2D shapes.

3. List properties of 2D shapes.

4. List similarities</td><td></td><td></td><td></td></tr>
</table>
</td>
<td>(SCO # 1, 2, 3, 5)
<u>MANIPULATIVE-GEOBOARDS</u>
Allow learners to use geoboards (and coloured elastic bands) to represent as many 2D shapes as possible.
Class discussion: Use guiding questions to have them explain reasons for forming shapes in order to discover properties. Discuss similarities and differences among 2D shapes.
Using both Square and Circular Geoboards, discussion can be generated on the properties of polygons and non-polygons.

SQUARE GEOBOARD

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

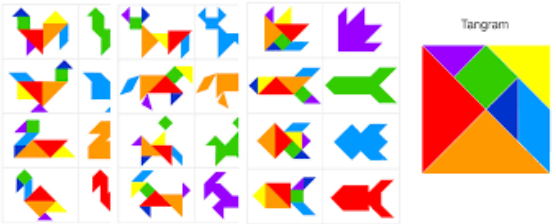
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
7. Differentiate between polygons and non-polygons in the environment. ***Values*** 8. Show an awareness of the existence of 2D shapes by discussing where they are found in everyday life.	among 2D shapes. 5. List differences among 2D shapes. 6. Classify 2D shapes as polygons or non-polygons. *(SCO # 1, 2, 4)* ***SCORING RUBRIC FOR 3D MODELS*** For each shape created using play dough/clay, learners will fill in the table below. Name of solid | Number of sides | Number of edges | 2D shapes that make up solid	*CIRCULAR GEOBOARD*  *(SCO # 1, 2, 3, 5)* ***TANGRAMS*** Provide learners with tangrams and have them identify and colour 2D shapes. Allow them to use puzzle pieces to create various polygons. Discuss why they are polygons. Challenge them to create their own 2D shapes using tangrams. Use tangrams to help them conceptualize the fact that shapes can be composed from other shapes, and can also be decomposed to form smaller shapes. Note: To cater for differentiated instruction, the level of difficulty of tangrams should be carefully selected based on students' ability.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies

Name of solid	Does solid - roll? - slide? (Please tick)	Solid - comes to a point - is curved all around (Please tick)

Scoring Rubric for 3D Models:

Description	Mark
Model is an exact representation of 3D shape. All properties of shape are evident.	3



(SCO # 1, 2, 4)

Guided discovery - BLINDFOLD

Provide learners the opportunity to describe features of objects which have been felt but not seen; For example, blindfold a learner and have him/her dip into a bag of 3D shapes. He/she will name and describe the object selected using the sense of touch, according to the following attributes: number of sides and edges, uniform thickness.

The following can also be asked:

1. Pick a shape with five sides.
2. Pick a shape with four edges.
3. Name the 2D shapes that make up the solid.

Similarities and differences between shapes will be discussed.

This can be done for whole class or small group instruction. It can also be used for peer tutoring.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies

Model is almost accurately represented. Most properties (at least 2) are evident.	2
Model is not accurately represented. Only 1 property is evident.	1

(SCO # 1, 2, 3, 4, 6, 8)
THINK PAIR SHARE

Allow learners to work in small mixed-ability groups. Observe them as they generate sorting rules and sort shapes accordingly. Listen as they discuss with peers. Allow them to explain properties of shapes, as well as reasons for selected sorting rules. Encourage discussion on similarities and differences between 2D and 3D shapes.

CONCEPT MAPS

Blank concept maps can be given to learners to fill in.

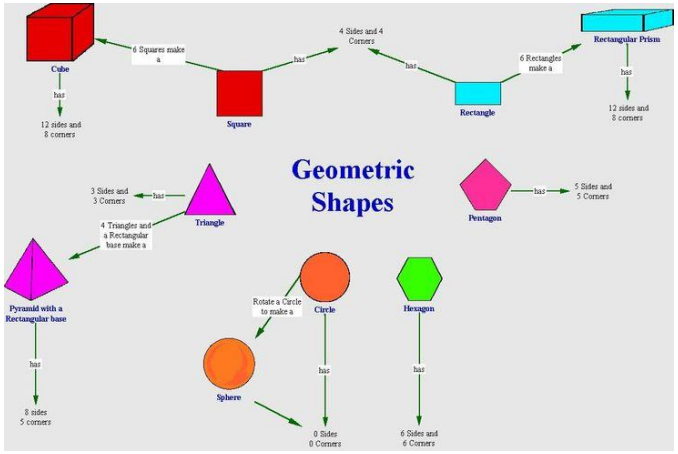
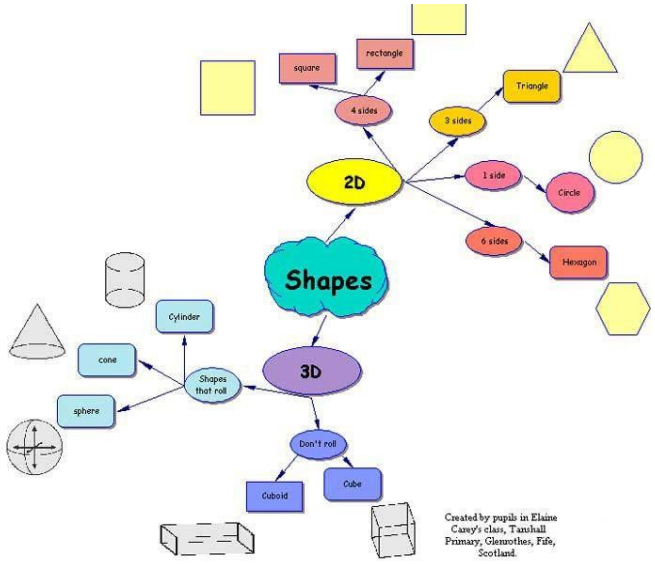
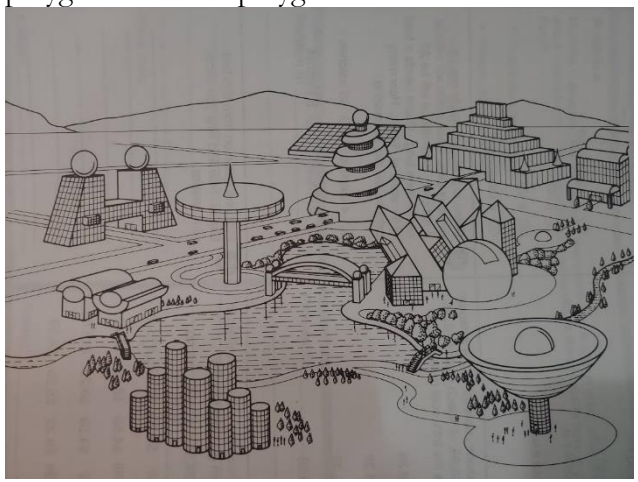
Learners will then use play dough/clay to create models of three 3D shapes.

Materials needed will be placed in learning centers in the classroom so learners have easy access.

(SCO # 1, 2, 3, 4, 6, 8)
Group work - GEOMETRIC SOLIDS - SORTING

Provide the opportunity for learners to engage in sorting using rules to group given 2D and 3D shapes based on attributes. Geometric solids (assorted shapes) can be used, as well as items found in their surroundings. They can place objects in clear bags to facilitate discussion.

Allow learners to categorize shapes based on their attributes. For example, pictures of shapes can be

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 	given, and these can be stuck in tables with given headings, based on attributes. See videos below. Grade 1 Math 12.1, Sort two-dimensional shapes Sorting 3D Shapes based on their attributes *(SCO # 6, 7, 8)* ***GAMES (USING PICTURES / MAPS)*** Use pictures/maps such as the one below to generate whole class or small group discussion. Present learners with the picture/map and ask them to identify the 2D and 3D shapes. This activity can also be used to differentiate between polygons and non-polygons.  Source: Targeted Mathematics - Level 4

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr>
<td></td>
<td>
(SCO # 6, 7, 8)
<u>OBSERVATION</u>

After playing game using pictures/maps, learners will be assessed individually.
<table>
<tr><th>Behaviour/Skill</th><th>Tick the one which applies.</th></tr>
<tr><td>Learner is able to identify:

- all 2D shapes in picture/map.

- most 2D shapes in picture/map.

- a few 2D shapes in picture/map.

- no 2D shapes in picture/map.</td><td></td></tr>
</table>
</td>
<td>
Questions such as the following can be written on cards.

Which building has rectangles and circles only?
Choose a building and name a 2D (or 3D) shape you see.
On how many buildings do you see triangles?
How many cylinders are in the picture?
Place your finger on a shape which is not a polygon.

Have learners select cards and answer the question selected.

SCO #4
<u>Guided discovery - ROLL OR SLIDE TEST</u>

Connect solids or 3D shapes to real-life situations. For example, set up a ramp and use geometric solids or actual 3D shapes found in the environment to test whether or not they will roll or slide. Allow learners to explain reasons for rolling or sliding.
</td>
</tr>
</table>

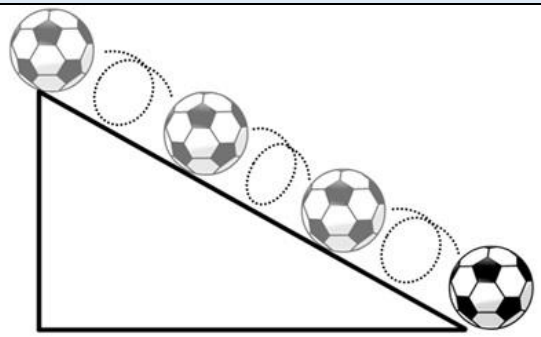
<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr>
<td></td>
<td>
<u>Note</u>:
The same instrument can be used for 3D shapes.

SCO #4
<u>OBSERVATION CHECKLIST</u>

Each 3D shape will be placed on the ramp and results will be recorded in the table below. Learners will tick the appropriate column.

<table>
<tr><td>3D SHAPE</td><td>ROLLS</td><td>SLIDES</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

(SCO # 6, 7, 8)
<u>EXIT TICKETS</u>

Give each learner four cards. He/she will name and draw a different real-life 3D object on each card and will name the 2D shapes that it is made of.
</td>
<td>


(SCO # 6, 7, 8)
<u>MATH WALK</u>
Provide opportunities for leaner to justify their thinking about involving 2D and 3D shapes. For example, take learners outdoors and have them identify and name 2D and 3D shapes that they come across and justify the reason for naming them.

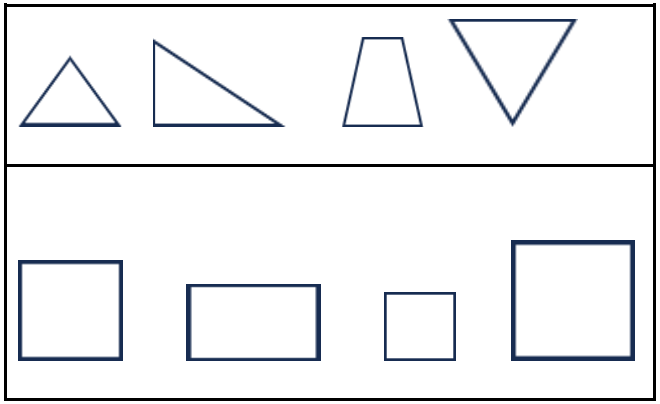
They can also identify examples and non examples of polygons.
</td>
</tr>
</table>

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*)
Inclusive Resources and Materials from Regional Specialists (*texts, family & community knowledge and resources, contextually relevant professional web resources*)
Additional Resources and Materials: • **tangrams** • **geoboards** • **geometric solids / assorted shapes** • **geometric cookie cutters** **eBooks:** Cubes, Cones, Cylinders, and Spheres.pdf

Essential Learning Outcome: Geometrical Thinking 2.2

Introduction to the Subject: Young children first begin forming concepts of shape long before any formal schooling is introduced. They are able to recognize and describe objects by their appearance or by qualities; so we hear them refer to a ball as 'a circle' or 'the box looks like a rectangle'. All children's informal introduction and understanding of shapes should be facilitated through hands-on explorations, investigations and certainly discussions of these shapes and their structures. Children need to compare, take apart and sort objects based on their attributes as they engage in structured and unstructured play. Children need to see the relevance of what they are learning about geometry as they interact with these objects in the natural environment. Their spatial awareness and geometrical thinking is stimulated/triggered through their constant exploring, analyzing, describing and investigating structures of concrete objects, shapes and space. The focus of geometry at the grade 2 level is in aiding learners explore shapes and their attributes and developing spatial relationships.
Strand (Topic): Geometrical Thinking
Essential Learning Outcomes: ELO 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, prism, pyramid) and 2D shapes
Key Skill /Concept: classifying, recognizing, naming, counting, analysing.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Knowledge 1. Identify 3D shapes in the environment based on the attributes of faces, vertices, and edges. 2. Classify 3D shapes as prisms and pyramids based on its bases and lateral faces. 3. Classify 3D shapes in the environment based on the attributes of sides and corners, circular appearances.	**(SCO 3, 5)** ***Conversation – justifying reason of choices*** Which Does not belong? Why? In small groups, have students complete activity sheets of crossing the shape that does not belong. Listen to discussions and reasons for choices. Provide opportunities for each group to present and explain the reasons for their choices by outlining the properties of shapes.	**(SCO 3, 5)** Whole Class/Paired Group Discussion Activity What am I? 2D Shape Naming Activity Provide opportunities for students to devise and follow a set of properties to create shapes. For example: Each pair of students will be given a model of a geoboard and an elastic band to create the shapes based on the properties read by the teacher. Example: I have three straight sides and three corners. Can you construct me? What am I?

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Skills 4. Examine various 3D shapes to identify the number of vertices, edges, and faces. Values 5. Acknowledge the importance of 3D and 2D shapes in the creation of various objects in the environment.	**Example of activity sheet:** **Which Shape doesn't Belong?** **Direction: In each row, colour the shape that doesn't belong.**  **(SCO 1,4)** Geometry Headband Grouping Game One student at a time will wear the geometry headband. A 3D curved surface shape will be attached to it. The student with the headband will be given the opportunity to ask the class three questions about the shape he or she is wearing in order to guess the name of his or her shape. Example: Does my shape have a vertex. How many faces does my shape have?	This activity will be repeated using properties of squares, rectangles, pentagons, hexagons, octagons. **(SCO 1,4)** Group Activity Allow students to identify 3D shape in the environment based on their attributes. For example, place students in groups. Give each group three or four real life shapes with identical properties. Focus only on 3D shapes with curved faces; cone, sphere, cylinder. **Example:** Group 1: marbles, cricket ball, sweet, passion fruit, Have students discuss the attributes that make their shapes similar, that is, the number of faces and shape of faces, the number of edges and vertices. Students will provide the group name for shapes with such properties. Provide each group with the opportunity to explain the properties of their shape and the name given to such shapes. **(SCO 2, 4)** Discovery (Group Activity)

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr>
<td></td>
<td>After guessing the type of 3D shape, the student will move to the corner designated for this type of shape. If the child guesses wrongly they will stand in the middle and try again in the end.
(SCO 2)

Observation

Listen to discussions in the different groups about the reasons for grouping shapes and the chosen name for each group of shapes? Pay attention to manipulation of shapes to identify the number of bases, and the type of lateral faces seen all around the particular shape. Provide students with the opportunity to explain to the class their findings.

<table>
<tr><th>Criteria for classifying shapes as pyramids or prisms</th><th>Yes</th><th>No</th></tr>
<tr><td>The learners were able to:</td><td></td><td></td></tr>
<tr><td>Use the apex as a common characteristic</td><td></td><td></td></tr>
</table>
</td>
<td>Provide students with models of cubes, cuboids, triangular prism, tetrahedrons, pentagonal prisms, hexagonal prisms, octagonal prisms, square based pyramid, pentagonal pyramid, octagonal pyramid. Have students manipulate objects and identify common characteristics of all the shapes?

Use guided questions, for example:

What do you notice about the faces of the shapes?
Do they have curved edges or straight edges?
What is the name given to 3D shapes with straight sides?
What do you think is an appropriate name for this group of 3D shapes?

In small groups, have students observe the shapes and form two groups based on common characteristics. Provide students with two papers, one with the word prism and the other with the word pyramid. Allow students to determine which group should be called pyramid and which should be called prism with reasoning. Allow students time to discover what makes each group of shapes similar.
Provide students with the following activity sheets to guide discovery.

<table>
<tr><td>Type of Shape</td><td>Type of shape used around the shape.</td><td>No. of Bases</td></tr>
</table>
</td>
</tr>
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies			Inclusive Learning Strategies
	for classifying the shapes.			
	Identify the shapes with the apex as having one base.			
	Group shapes on the premise of having two identical bases.			
	Recognise triangular shapes all around a group of shapes.			
	Recognise rectangular shapes all around a group of shapes.			
	Correctly name the groups as prisms and pyramids.			

Prism		
pyramid		

(SCO 1,2,4)

What shape do I have?

Provide opportunities for the learner to make, talk about, and classify shapes and objects from their own and other cultures. For example:
- plane shapes (with paper, geoboards, Logo, and so on)
- models of spheres, cuboids and other prisms, cylinders, cones, and pyramids (by using playdough, for example);

Also, Learners can be placed in pairs and they will dip for a shape. Using the activity sheet below they will identify the properties of their shape. Emphasis will be placed on the bases and the classification of shape (prism or pyramid) as the basis for naming their shape. Each pair of learners will be given an opportunity to present their findings with reasoning.

Shape (prism or pyramid)	Picture of base	Number of			Name of Shape
		Edges	Faces	Vertices	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	(SCO 1,4) Creating Board Name Chart Having identified the name of their shape and its properties, learners will engage in a whole class activity of creating a 3D board chart by placing their shapes on the chart next to its name and properties. Learners will engage in an extended activity of bringing in additional shapes or pictures of shapes to put on the chart.	

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*
As we concentrate on the individual components of solid objects, like points and edges, flat or curved outside surfaces, students learn to consider if a shape may be stacked on top of or underneath other shapes, as well as whether it rolls or not. Students will discover that certain solids only have flat surfaces made up of triangles, rectangles, squares, pentagons, and other polygons, while others have curving exterior surfaces.

Points to remember when teaching students about shapes.

- Shapes may appear in different orientations and sizes.
- The bases may not always appear at the top or the bottom of a shape.

A 3D shape is an object with length, width/breadth, and height, known as solid shapes. Pyramids, prisms, spheres, cylinders and cones are examples of three-dimensional shapes.

Fig. 1 Dimensions of 3D Shapes

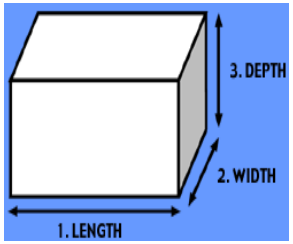
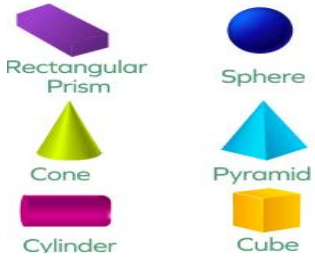


Fig: 2 Examples of 3D Shapes



2D shapes are flat shapes which have only two dimensions, length and width. They have no thickness. Triangles, rectangles, circles are a few examples of 2D shapes. 2D shapes made up of only straight lines are called polygons.

Fig. 1 Dimensions of 2D shapes

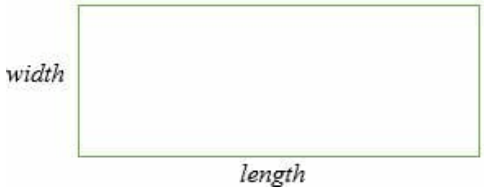
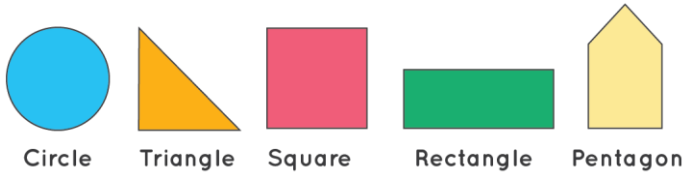
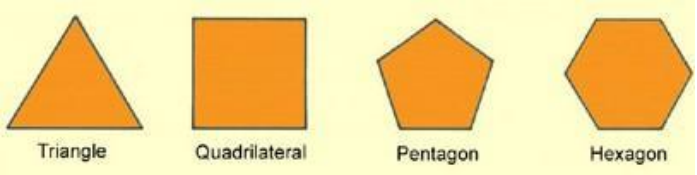


Fig. 2 Examples of 2D Shapes



A polygon is a flat, plane, two-dimensional closed shape bounded by line segments. Common examples of polygons are triangles, squares, rectangles, pentagons, etc. A circle is not a polygon.



A three-dimensional shape (3D shape) with flat polygonal faces, straight edges, and sharp corners or vertices is called a polyhedron. Two common types of polyhedrons or polyhedra are prisms or pyramids. These models can be right and oblique in shape. Related to these shapes are cones and cylinders but since they have curved surfaces, they are not polyhedra.

Fig. 1: Solids which are not polyhedrons

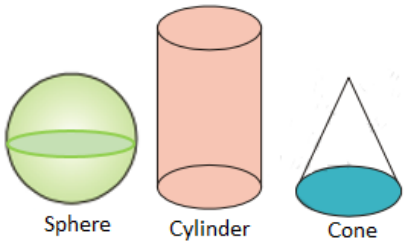
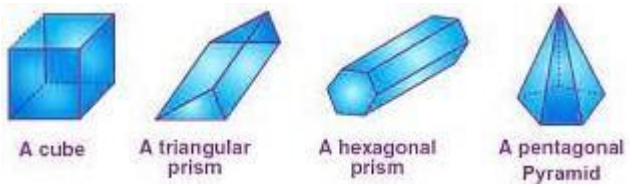


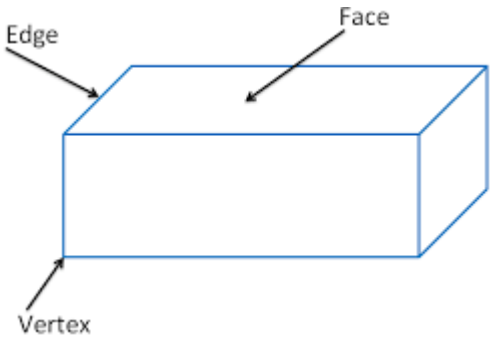
Fig. 2: Examples of Polygonal 3D shapes



The parts of a solid or 3D shape can be classified as faces, edges and vertices.

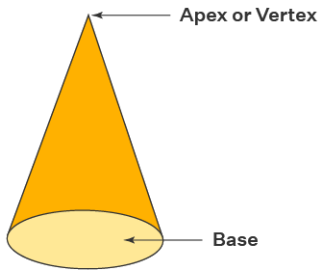
- Faces: A face is a flat or curved surface on a 3D shape.
- Edges: An edge is where two faces meet.

· Vertices: A vertex is the corner where edges meet.

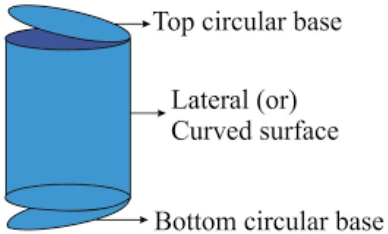


Some examples of 3D shapes and their properties in terms of number of edges, vertices and faces.

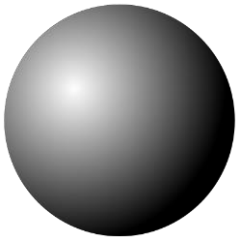
★ Cone : A cone starts with a closed curve in a plane and a separate point which does not lie in the point called an apex. The starting curve and the region inside it is called the base of the cone. Sometimes the base of the cone is considered a part of the cone, and sometimes it isn't. Either shape with or without the base can be called a cone. Some cones can be right and some can be oblique in shape. In terms of faces, edges and vertices; a cone has one curved face, one circular face, curved edges and an apex/vertex. An apex is a point that does not lie within a shape.



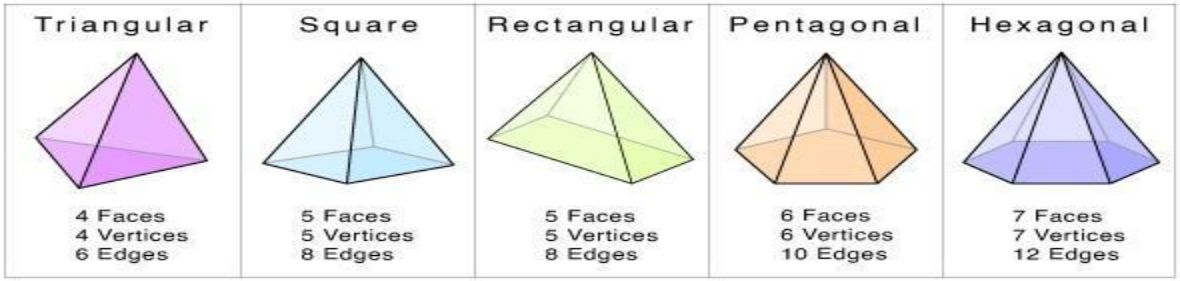
★ Cylinder: A cylinder is a tubed shaped object. It consists of two circular bases joined by a curved face. A Cylinder has two curved edges and no vertices because it is made up of curved surfaces.



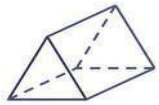
★ Spheres: A round ball shape solid. It has no surface, edge or vertex..



★ Pyramid: A solid in which the base is a polygon and all lateral faces are triangles that meet at a point called an apex. They are often named based on the bases that make the pyramid.

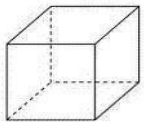


★ Prism: A solid with two identical polygonal bases and whose edges are joined by rectangular faces. Prisms are often named according to the kind of polygon that makes the base of the prism. For example, a prism with a triangular base is called a triangular prism.



Triangular prism

Number of faces: 5
Number of edges: 9
Number of vertices: 6



Square prism

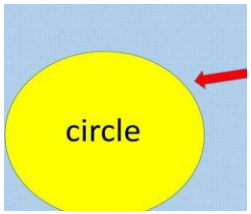
Number of edges: 12
Number of vertices: 8
Number of faces: 6

Pentagonal prism

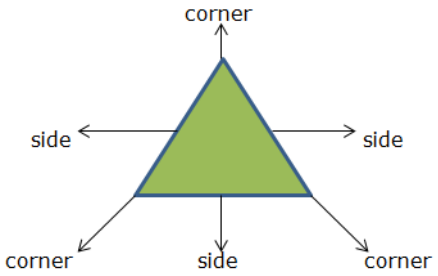
Number of edges: 15
Number of faces: 7
Number of vertices: 10

Some examples of 2D polygons and their properties in terms of number of corners and sides

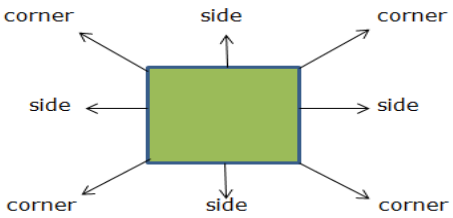
1. Circle is round with no corners.

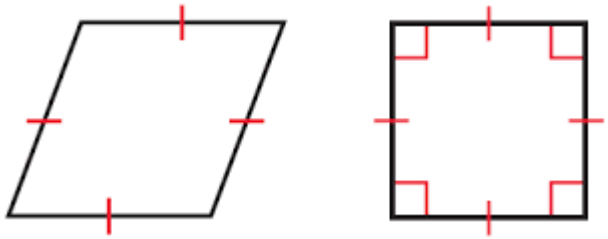


2. A triangle is made up of three sides and three corners.

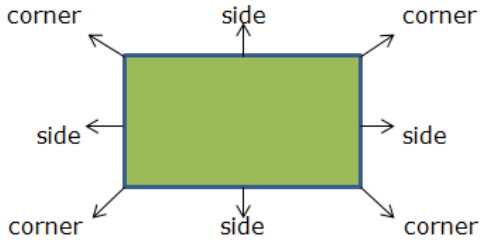


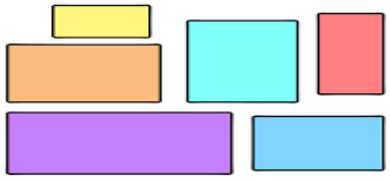
3. A square is made up of sides of the same length and 4 corners.



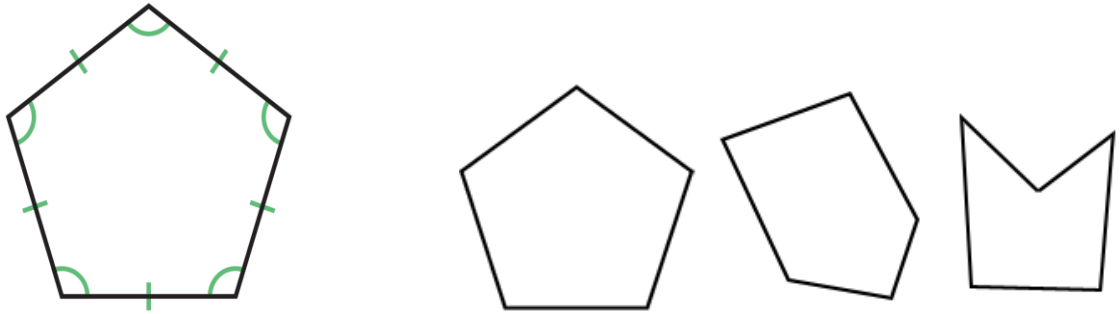


4. A rectangle is made up of 4 sides in which opposite sides are equal in length and 4 corners.





5. A pentagon is made up of 5 sides and 5 corners.



Vocabulary: circle, triangle, square, pentagon, hexagon, corners, vertices, sides, cone, edges, faces, cylinder, prism, pyramid, sphere, cone, height, length, width, depth, breadth, octagon, polygon

Additional Resources

- Geoboards
- 3D shape models
- Fubber bands
- Bristol board
- Markers

Literature / Books

If you were a polygon by Marcie Aboff
If you were a quadrilateral by Molly Cece Barlow Blaisdell
Sphere (First Step Non Fiction) by Jennifer Boothroyd
Captain Invincible and the Space shape by Stuart J. Murphy
What in the World is a Sphere? (SandCastle: 3D Shapes)) by Anders Hanson
The greedy triangle by Marylyn Burns

Opportunities for Subject Integration:

Art and Craft
creating chart
creating 2D and 3D board games
outlining 2d shapes in sand and on paper
engage in 2D shape printing
formulating 2D or 3D picture frame outlines

Science and Technology
Use 3D shapes to design and construct weather instruments to determine wind direction and measure rainfall.
Sorting out litter using different attributes examples, size, colour, shape.
Designing and making toy gadgets using discarded materials.

Social Studies
Use knowledge of 2d and 3D shapes in giving physical descriptions of important buildings in the community.
Recycling: shapes that can be stacked, shapes that roll.
Use 2D and 3D shapes to create a model to help differentiate some of the main landform.

Language Arts
Create an acrostic poem on 2D and 3D shapes.
Create a word puzzle of 2D and 3D shapes.
Write a descriptive paragraph and or sentences on 2D and 3D shapes.
Have an Open Mic about 2D and 3D shapes.
Create a radio/television programme on 2D and 3D shapes (in class or on school level).

Music
Creating songs and jingles.
Create a calypso on 2D and 3D shapes.

Elements from Local Culture:

- sawing wood for building and furniture making (chopping board, planks as cuboids)
- cylindrical pillar molds
- electrical poles
- charcoal pit
- water well

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

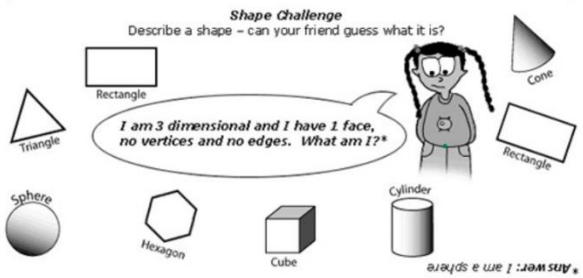
- Give students everyday material that have 2D shapes to create collages: (to bring the awareness that these shapes are intangible) base of bottles, erasers, ice cone base etc.
- Take them on fields trips where they observe surfaces of 2D and 3D shapes in their immediate environment

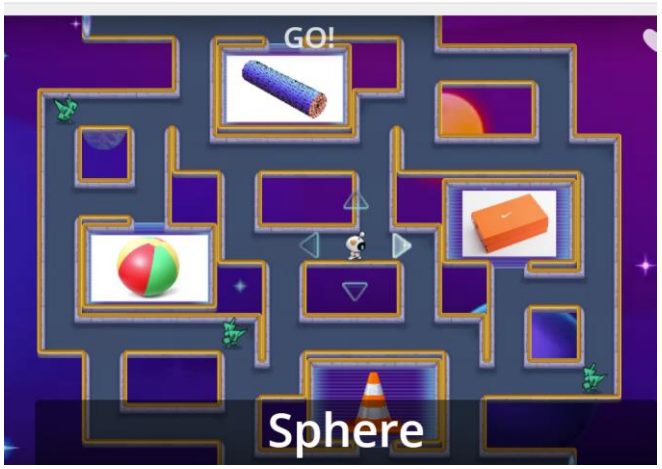
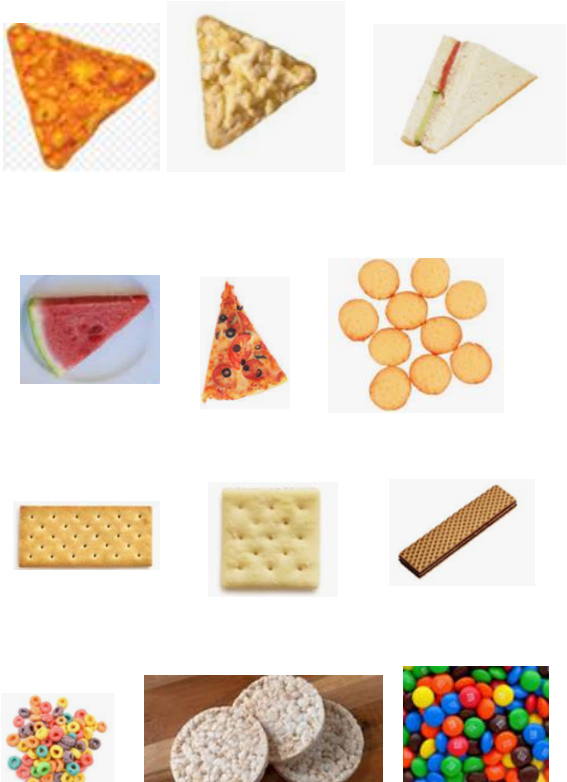
Resources for a learner who needs a challenge: *(Links to learning activities and resources in later grades)*

Create original models of 3D shapes where they highlight the properties of their shape (edges, vertices, faces).
Deconstruct a teacher-generated model to identify the 2D shapes that created that piece. Print each 2D shape as the model is deconstructed.
Deconstruct a 3D model and identify all the 3D shapes that were part of its make-up.
Create an original construct of a household tool using 3D objects to make their work easier.

Essential Learning Outcome: Geometrical Thinking 2.3

Introduction to the Subject: Young children first begin forming concepts of shape long before any formal schooling is introduced. They are able to recognize and describe objects by their appearance or by qualities; so we hear them refer to a ball as 'a circle' or 'the box looks like a rectangle'. All children's informal introduction and understanding of shapes should be facilitated through hands-on explorations, investigations and certainly discussions of these shapes and their structures. Children need to compare, take apart and sort objects based on their attributes as they engage in structured and unstructured play. Children need to see the relevance of what they are learning about geometry as they interact with these objects in the natural environment. Their spatial awareness and geometrical thinking is stimulated/triggered through their constant exploring, analyzing, describing and investigating structures of concrete objects, shapes and space. The focus of geometry at the grade 2 level is in aiding learners explore shapes and their attributes and developing spatial relationships.
Strand (Topic): Geometrical Thinking
Essential Learning Outcomes: ELO 2.3: Recognizing, Naming and Describing Shapes - Describing relationships between and among shapes
Grade Level Expectations: ● Recognize, describe and compare attributes of shapes and objects based on number of sides, corners, rolls, or slides, flat sides or curved sides, uniform thickness or not (coming to a point, curved all around). ● Describe the relative positions of several objects and the movements needed to get from one object to another.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Key Skills/ Concept: Observing, recognizing, comparing 2-D shapes, 3-D objects **Learners will be expected to:** **Knowledge** 1. Compare shapes and objects (2D & 3D) on the basis of attributes using appropriate vocabulary. 2. Describe the relative location/position of 2D shapes and 3D objects in relation to other shapes and objects (above/below, over/under, beside/inside/outside, to the right/left of behind/in front of). 3. Describe the movements required to place an object in a particular position, relative to another object (left/right, up/down).	**SCO #1 and #5** **Exit Ticket** Students will be given a half sheet of paper. Students will be given directions as follows: 1. Write the number of sides that a rectangle has. 2. Write the number of sides that a circle has. 3. Write the number of corners that a triangle has. 4. Draw a shape with three sides. 5. Draw a shape with four equal sides. 6. Draw a shape with no corners. Peer assessment  *Adopted from BBC world website.* Product Have students program a sequence of steps on a grid that directs a digital image (or robot or classmate) to move through a maze from a starting position to a specific location in the maze, or to the exit. For example, for the	**SCO # 1 and #5** **Discussion** **Shape Feast** Provide opportunities for Students to compare different shapes with each other. Use as many objects of different shapes as possible. Provide each student with at least two objects, and pictures of shapes from the environment. Ask students the following question: How many ways can you sort these objects into sets? Ask them to explain their reasons for their sorting each set. Allow students to classify real-life examples of different shapes. For example, students and the class teacher will bring in snacks that are in various shapes. Students will have a shape picnic where the snacks are placed in separate serving dishes. Each student will be allowed to take two different snacks. The students in groups will identify the shapes and describe the shapes on the basis of attributes. The students will then compare the shapes using the attribute of number sides.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Skills 4. Use a variety of models, materials to create shapes. **Values** 5. Volunteer to identify objects in the environment that are in various shapes.	grid below, have them both give and follow directions, such as:  Retrieved from: https://wordwall.net/resource/59692040/3d-shapes-aliens How might you get from go to the cuboid if you had to go around all the things in the way? If I'm at the ball and go up 5 and then left 5, what shape will I land on? **SCO #1 AND #5** **Observation** As students walk around the school and identify shapes found in environment, they complete the following table	Snacks to bring in: Doritos, popcorners, sandwiches, pizza, watermelon slices, Toblerone chocolate, cookies, crackers, m and m, wafers, gummy fruit rings, fruit loops, rice cakes, cheese. 

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies

Shape	Number of Sides	Number of Corners

SCO # 1 and #4

Journaling (Group Work)

In groups of 3, give each group the geometric solids - rectangular prism or a triangular prism or a square pyramid. Have students discuss how their solid is the same as another solid. Then ask them to discuss how it is different from another group's solid.

SCO #1, 2 , 3 and #5

Provide opportunities for students to use positional words to locate everyday objects in the classroom. For example, have students write clues to describe the location of one object relative to another. Encourage them to use distance and direction vocabulary to describe the object's location (e.g., the turtle eggs are buried 20 steps to the right of the pond).

Allow students to give and follow directions for moving shapes from one location to another. For example, read (or co-create with students) a story that involves shapes moving on a path. Have students draw and describe the path in the story using the vocabulary of

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Give each group a cone, a cylinder or a sphere or a cube and compare it to their first solid. Ensure students are using correct vocabulary. Students should record their observations in their Math journal. Have the groups display their solids and their observations.  **SCO #2** **Observation** Listen to students as they describe the position of an object.	distance and direction. They might use a large floor grid or the grid on an interactive whiteboard to organize and sequence their directions. Also, have students write directions from a starting point (e.g., the classroom door) to a given shape in the classroom (e.g., the rectangular window). Randomly select from the collection of directions and ask students to test whether the directions lead to the shape. If they don't, ask them how the directions could be adjusted. **SCO #1 and #4** **Creating Shapes** Project images of structures on a screen or look at large photos of structures. Look at photos of structures and buildings found in the neighbourhood. Show images of important buildings including where the families in the class have come from. Ask questions to consider together: What do you notice? What do you wonder? What 2D shapes do you see?

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr>
<td></td>
<td>Check that the student:
1. Used vocabulary that identifies position.
2. Used vocabulary that matches the actual position of the object.

Checklist

<table>
<tr><th>The student:</th><th>Yes</th><th>No</th></tr>
<tr><td>Used vocabulary that identifies position.</td><td></td><td></td></tr>
<tr><td>Used vocabulary that matches the actual position of the object.</td><td></td><td></td></tr>
</table>

SCO #3

Games</td>
<td>What 3D shapes do you see?

Provide students with a variety of materials to explore the connections between shapes and structures such as small blocks, large building blocks and empty containers. Invite students to build with materials of their choosing on the tables or on the floor. Students may use photos of structures provided to reproduce those structures or to use as an inspiration for their own structures. In small groups, give students materials (popsicle sticks, toothpicks, playdough) to construct shapes (pentagon, hexagon, heptagon, octagon). Have students discuss what is the same and different about the shapes they have created.</td>
</tr>
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	In pairs, each student is given a gridded paper and similar cut out shapes or small 3D solids. Students will be separated by a small screen. Student 1 will place all of his shapes or objects in the squares on his gridded paper. He then has to give Student 2 directions using appropriate vocabulary so that Student 2 can place the shape or object in the exact position as that of Student 1. Teacher will observe each pair of students noting if directions are given properly and if students are placing the shapes or objects in the correct position. 	

Useful Content Knowledge for the Teacher about the Outcome:

Many objects are associated with basic shapes. A flat or two-dimensional shape has different attributes that are used to describe the shapes and show what makes them similar and different. Some of the attributes are the number of sides and the number of corners.

A *Triangle* is a closed figure or a closed shape that has **three straight sides** and **three corners.**

A *Square* is a closed shape that has **four equal straight sides** and **four corners**. The four sides are equal in length and the four corners are the same size.

A *rectangle* is a closed shape that has **four sides** and **four corners**. The opposite sides are the same length and the four corners are the same size.

A *Pentagon* is a closed shape that has five sides and five corners.

A *Hexagon* is a closed shape that has six sides and six corners.

A *Heptagon* is a closed shape that has seven sides and seven corners.

An *Octagon* is a closed shape that has eight sides and eight corners.

A *circle* is a round closed shape that has **no sides** and **no corners**.

Location and Movement

In mathematics, position or location is used to help students describe where an object is located in relation to other objects. Vocabulary such as above, below, behind, inside, outside, over, under, beside, in front are used to show the location of an object in relation to other objects. For example, the cylinder is behind the door.

Direction is used to describe the movements required to place an object in a particular position relative to another object. The vocabulary associated with direction are up/down; left/right.

It should be noted that the order of the steps are important when describing these movements.

Vocabulary

triangle square rectangle pentagon hexagon heptagon octagon circle cube cuboid prism pyramid sphere cylinder side corner edge vertex(vertices) position solid roll slide stack opposite behind near between in front of next to near

Inclusive Resources and Materials from Regional Specialists

playdough toothpicks geoboards pattern blocks rubber bands coloured 2D shapes 3D solids tangrams

Additional Resources and Materials

The Greedy Triangle by Marilyn Burns
Where's Spot by Eric Hill
Tangled by Anne Miranda
All Shapes Matter by Sreekanth Kumar and Chakra Sreekanth
I Spy Shapes in Art by Lucy Micklethwaite
Bug Dance by Stuart Murphy
The Shape of Things by Daley Ann Dodds

https://www.youtube.com/watch?v=6FTh2L8Woz0
https://www.youtube.com/watch?v=0YtJUIcxYss
https://www.mathsisfun.com/shape.html
https://www.mathsisfun.com/geometry/index.html

Opportunities for Subject Integration:

Music

- Students can compose songs and jingles about shapes and solids.
- Use of instruments that are of different shapes or have parts that are different shapes - the triangle, the drums (circular part), xylophone (rectangles).

Science

- Relating shapes to the earth.

- Geometric forms in nature.

Language

- Using vocabulary to describe shapes and to compare 2D shapes and 3D objects.
- Listening to and writing stories based on 2D shapes and 3D objects.

Social Studies

- Identifying shapes on a map (use of a key).
- Describing positions of different objects on a map.
- Locating objects on a map, given a description of its position in relation to other objects.

Art & Craft

- Creating artwork with shapes on a geoboard using coloured rubber bands.
- Drawing and colouring shapes.
- Creating shapes and solids using playdough and toothpicks.
- Creating geometric artwork using different shapes/solids.

Elements from Local Culture:

- Playground
- Community park
- Driving/Walking in the community
- Board games
- Games at school (hopscotch, ring o roses)

Resources for a learner who is struggling:

- Use verbal prompting at every stage of the learning activity.
- Use of geoboard to form shapes.

Resources for a learner who needs challenge:

Allow students to play Chess instead of draughts.

Essential Learning Outcome: Geometrical Thinking 3.1

Introduction to the Subject: Young children first begin forming concepts of shape long before any formal schooling is introduced. They are able to recognize and describe objects by their appearance or by qualities; so we hear them refer to a ball as 'a circle' or 'the box looks like a rectangle'. All children's informal introduction and understanding of shapes should be facilitated through hands-on explorations, investigations and certainly discussions of these shapes and their structures. Children need to compare, take apart and sort objects based on their attributes as they engage in structured and unstructured play. Children need to see the relevance of what they are learning about geometry as they interact with these objects in the natural environment. Their spatial awareness and geometrical thinking is stimulated/triggered through their constant exploring, analyzing, describing and investigating structures of concrete objects, shapes and space. The focus of geometry at the grade 2 level is in aiding learners explore shapes and their attributes and developing spatial relationships.
Strand (Topic): Geometry
Essential Learning Outcomes: Composing, Decomposing and Transforming Shapes - Combining Shapes
Grade Level Expectations: Construct composite objects using cubes, cones, cylinders, spheres, prisms, and pyramids and identify characteristics of these objects that make them easy to build with or not easy to build with. Construct composite 2D shapes.
Key Skill: Combining shapes to construct 2D and 3D shapes

<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

Knowledge
● Duplicate composite 2D and 3D shapes that are presented.
Skill
● Design composite 2D</td>
<td>Observation Checklist
<table>
<tr><th colspan="4">Recreating Shapes Observation Checklist</th></tr>
<tr><th>Behaviours</th><th>All</th><th>Most</th><th>Some</th></tr>
<tr><td>1. Learner identifies the</td><td></td><td></td><td></td></tr>
</table>
</td>
<td>Engage Learners in a whole class discussion, Prior to viewing a video, see link below:

1. What are the 2D shapes that you know?</td>
</tr>
</table>

<table>
<tr>
<th>Specific Curriculum Outcomes</th>
<th>Inclusive Assessment Strategies</th>
<th>Inclusive Learning Strategies</th>
</tr>
<tr>
<td>representations combining the faces of more than one 2D shape.
● Create composite 3D structures using 3D objects in their environment.
● Make composite representations of 2D and 3D shapes using technology.
● Solve problems involving 2D and 3D shapes.

Values
● Justify the use of the shapes used to create their composite 2D and 3D shapes stating the properties of the shapes that make them suitable.</td>
<td>
<table>
<tr><td>larger plane shapes created.</td><td></td><td></td><td></td></tr>
<tr><td>2. Learner identified the shapes used to create the 2D shapes.</td><td></td><td></td><td></td></tr>
<tr><td>3 Learner used the cut outs of the given plane shapes to recreate the given composite shape.</td><td></td><td></td><td></td></tr>
<tr><td>4. Learner identified the larger solid created.</td><td></td><td></td><td></td></tr>
<tr><td>5. Learner identifies the solids used to create the composite 3D shapes.</td><td></td><td></td><td></td></tr>
<tr><td>6. Learner correctly uses the solids to recreate the composite 3D shapes.</td><td></td><td></td><td></td></tr>
</table>
</td>
<td>2. Do you know how to create any 2D shapes using other 2D shapes? (Discuss)

Learners view a video on composite 2D shapes.
Make New Figures - Two Dimensional / 2D Shapes from Learning Adventures

The video will be paused at different intervals to allow the learners to predict the new shape being formed.
1. What was the 2D composite shape formed and what 2D shapes were used to create them.
2. What are the new 2D shapes that you learned from viewing this video?

Have learners observe 2D shapes composed using more than one plane shape. They identify the bigger shape created and then discuss the combination of shapes used to create this shape.
Examples- Pupils study the shapes below.</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>

Pair Presentation

<table>
<tr><td colspan="5">2D Composite Design</td></tr>
<tr><td>Criteria</td><td>3 marks</td><td>2 marks</td><td>1 mark</td><td>0 mark</td></tr>
<tr><td>Name composite shapes</td><td>The names of all the shapes created are accurate.</td><td>The names of two of the composite shapes are accurate.</td><td>The names of one of the composite shapes is accurate.</td><td>The name does not match the shape.</td></tr>
<tr><td>The learners accurately state all the shapes incorporated in their design.</td><td>Only the shapes used are named and all of them are identified.</td><td>Most of the shapes used in the design are named.</td><td>Less than 50% of the shapes used are named.</td><td>The student does not name the shapes used.</td></tr>
<tr><td>The learners give reasons for using the chosen shapes in</td><td>The reasons for using the shapes accurately</td><td>The reasons for using the shapes match</td><td>The reasons for using the shapes match less</td><td>The reasons don’t match any of the properties</td></tr>
</table>

</td><td>

Example 1 Example 2


Guided Questions

1. What is the largest shape that you see?
2. What smaller shapes are used to create the shapes?
3. How many of each of the smaller shapes are used?
4. Can you see another way the bigger shapes could have been created?

Allow learners to manipulate given cut outs of the 2D shapes used and recreate the shapes.

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

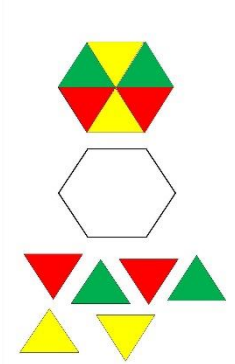
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies

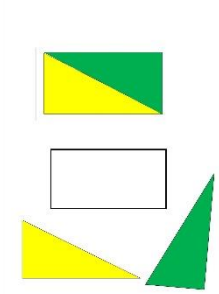
their design.	match all the properties and function of the shapes in the design.	most of the properties and function of the shapes in the design.	than ½ of the properties and function of the shapes in the design.	nor function of the shapes used in the design.

Group Work Assessment Checklist

Criteria		3	2	1	0
Key- 3 All 2 Most 1 Some 0 None					
Learners	The learners listened while someone else was making a contribution.				
	The learners cooperated and was able to work as a team.				
	The learners respected the contributions made				

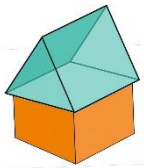
Example 1 Example 2





Provide the opportunity for learners to observe 3D shapes composed using more than one solid shape.

Example 1 Example 2



Guiding Questions

1. What was constructed using the 3D shapes?
2. What 3D shapes were used?

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies

		by each other.				
		The learners contributed towards every step of the task.				
	Task	The steps of tasks are completed.				
		The shapes used to create the picture are suitable.				
		The cut outs were pasted strategically to create the picture.				

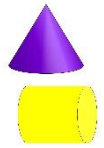
Checklist

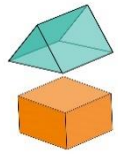
Behaviours	
1. All the shapes are used.	
2. All the shapes are positioned correctly.	
3. The picture is recreated accurately	

3. Can you think of any other 3D composite designs? What are the 3D shapes used to created these 3D composite designs?(Discuss)

Allow learners to manipulate given solid shapes and recreate the 3D shapes previously studied.

Example 1 Example 2





Have learners view a video on how to create composite 2D shapes before they create composite shapes of their own. [Do you want to build a snowman? — composing shapes | MightyOwl Math | Kindergarten]

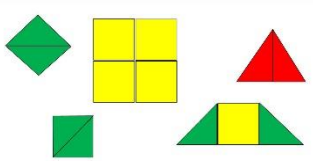
Prior to viewing the video they will be asked the following?

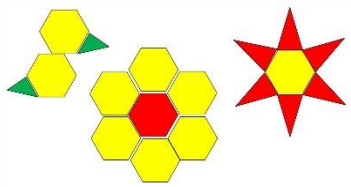
1. Have you ever seen a snowman?
2. What 2D shapes will you use to draw a snowman? (Pupils are encouraged to draw a sample snowman.)

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr>
<td></td>
<td>
Project
Learners create a 3D model of a structure in their community, and present to the class. In their presentation they state the 3D shapes used and the reason for using the shapes.
<table>
<tr><td>Criteria</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>Does the model resemble the structure selected?</td><td>.</td><td>The model looks like the structure.</td><td>The model looks somewhat like the structure.</td></tr>
<tr><td>Do the 3D shapes used in the model match the shapes in the actual structure?</td><td>The model includes all the shapes seen in the actual structure.</td><td>The model includes most of the shapes in the actual structure.</td><td>The model includes some of the shapes in the actual structure.</td></tr>
<tr><td>Does the learner use the</td><td>All the reasons given for</td><td>Most of the reasons given for</td><td>Less than half the reasons</td></tr>
</table>
</td>
<td>
The video will be paused at different points to create the opportunity for the learners to guess the shape that will be used to create the part of the snowman being described.

Just prior to the part where composite shapes will be created using triangles the learners will be asked:
1. What composite shapes can you create using triangles?
At the end, the pupils are asked:
1. How many of the shapes discussed did you have?
2. Did you have any other? (The learners are encouraged to share with the class.)

Allow learners to work in pairs with a given set of plane pattern blocks manipulatives to create 3 different composite 2D shapes using the faces of the pattern blocks.
</td>
</tr>
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies				Inclusive Learning Strategies
	properties of the shapes to justify reasons for using them?	the shapes used are justified and explanations include the properties of the shape.	the shapes used are justified and explanations include the properties of the shape.	given for the shapes used are justified and explanations include the properties of the shape.	 Some sample designs the children may come up with.  The learners will then state the shape they created, state the shapes used in their design and give reason for using these shapes. Allow learners to work in small groups to create a 2D picture of an object. For example, a car, house, flower, robot, fish to name a few. • First the learners discuss the design of choice

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		• Then they combine ideas to draw a sketch of the design. • The learners draw the shapes they need on paper and cut them out. • They paste the cut outs to create their design. Some sample designs.  The learners will identify the new shape they create and name the shapes used to create their composite shape. Engage learners in solving the following. The Learners are engaged in a game where they must guess the object which inspired the creation of a 3D composite shape.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		Firstly, the learners identify an object in the environment and create an image of its shape using solid blocks like those shown below. Then the class is engaged in guessing the object which inspired the creation. The student who guesses the correct object gets the next turn.  Other building blocks, play dough or molding clay can be used in the above activity.

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*)

Inclusive Resources and Materials from Regional Specialists :
Building blocks, roblox blocks, molding clay/play doh, cut outs

Opportunities for Subject Integration:

- Creating pictures and models in art.
- Building structures in the science areas.
- Expository writing in Language Arts describing how to build a model.

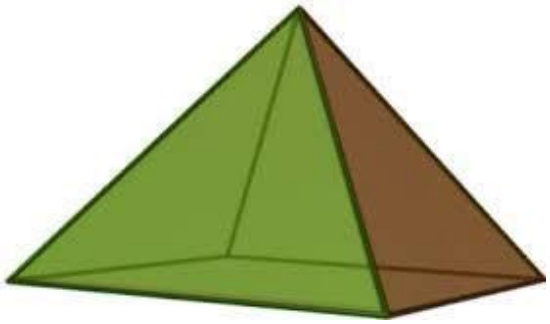
Elements from Local Culture:

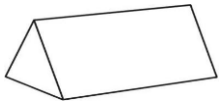
Learners are engaged in building things that are around them.

Essential Learning Outcome: Geometrical Thinking 3.2

Introduction to the Subject: Young children first begin forming concepts of shape long before any formal schooling is introduced. They are able to recognize and describe objects by their appearance or by qualities; so we hear them refer to a ball as 'a circle' or 'the box looks like a rectangle'. All children's informal introduction and understanding of shapes should be facilitated through hands-on explorations, investigations and certainly discussions of these shapes and their structures. Children need to compare, take apart and sort objects based on their attributes as they engage in structured and unstructured play. Children need to see the relevance of what they are learning about geometry as they interact with these objects in the natural environment. Their spatial awareness and geometrical thinking is stimulated/triggered through their constant exploring, analyzing, describing and investigating structures of concrete objects, shapes and space. The focus of geometry at the grade 2 level is in aiding learners explore shapes and their attributes and developing spatial relationships.
Strand (Topic): Geometrical Thinking
Essential Learning Outcomes: ELO 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, prisms, and pyramids through making footprints, making shadows, or slicing.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
explore, investigate, predict, deconstruct **Knowledge** 1. Identify 2D shapes that are part of the composition of 3D objects using footprints, making shadows, or slicing.	**(SCO 1, 2)** Think, Pair, Share: Shapes Revealed Have students complete a recording sheet and present their findings to the class. Provide students with shapes to cut out, as it might be difficult to draw some shapes. Listen as students explain the process and possible discoveries made; example shape orientation depending on angle.	**(SCO 2)** Group work - Show the Shadow Image Create opportunity for students to explore the relationship between 3D objects and common 2D shapes. Encourage students to investigate and predict the shape of shadows cast by different 3D objects. For example: When students explore the shadow of the sphere, they will realize that it forms a circle.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Skills 2. Deconstruct 3D objects to identify the 2D shapes that constitute their formation through slicing, making shadows and footprints. **Values** 3. Volunteer to conduct a presentation on 2D shapes in the composition of 3D objects.	**Cut and Paste the 2D Shapes used to make me?**  **2D shape** / **Number of shape used** **(SCO 2,3)** Prism Art Wall/ Prism Deconstruction Booklet Provide opportunities for students to present and explain their artwork. Pay attention to the number	Allow students to work in small groups, to explore using spheres and pyramids, with a torch or other light sources and white Bristol board to create shadows. Try to limit the  number of shapes per group to two, a sphere and a type of pyramid. For example: Retrieved from: http://wondersinkindergarten.blogspot.com/2016/02/shape-shadows-exploring-2d-and-3d.html Before students begin, have them predict what shadow an object will make. This would help to focus learners' attention on the faces of the objects. Have students choose the right shape pattern block to represent the different shadows cast by the object. Have students explore the various shadows that one object can create when it is positioned in different orientations. Ask students to consider the minimum number of shapes required to cast all the given shadows. **(SCO 1,2,)** **Guided Discovery:** What 2D Shapes can I make?

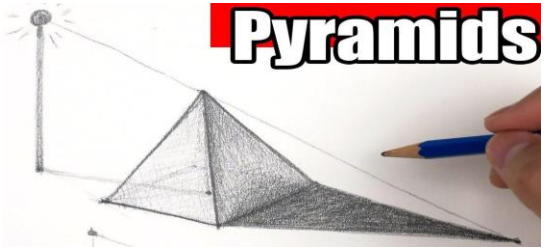
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	of bases in each case and the number of lateral faces. While students are working, engage them in discussions. Use guided questions such as: 1. How many bases does this shape have? 2. What type of 2D shape is created by the footprint of the bases? 3. What type of shape is created by the footprint of the lateral faces of this shape? Allow students to stick their prism footprints on the prism art wall or put all their artwork together to form a Prism deconstruction booklet. **(SCO 2,3)** Before and After Picture Frame Have students create a before and after picture frame by sticking the 2D shapes used to create each shape on the after side of each picture frame outline. Provide opportunities for students to display their work.	Provide learners with 3D block prisms such as cubes, cuboids, triangular prisms, pentagonal, hexagonal, octagonal prisms, with activity sheets, paint and paint trays to work in pairs. Ensure that each pair of students is given two shapes. Allow students to create footprints of the bases and lateral faces of each object. Have students identify types of shapes and number of shapes used to create their prism. Activity sheet What 2D shapes can I make?  Direction: Stamp all similar faces on the same side. Type of 2D shape: _____ Type of 2D shape: _____

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		 **(SCO 1,2,)** Guided Inquiry 3D Surgical Cut-Outs Allow students the opportunity to make predictions regarding the type and number of 2D shapes they will have after deconstructing their 3D shapes by slicing. Use guided questions to help activate their thinking and stimulate discussion: For example: Examine the different 3D shapes on your surgical table. Pay attention to the formation of 2D shapes after slicing. 1. What 2D shapes can you foresee after slicing? 2. How many of each shape will you be able to get? Have students use their desks as their surgical tables. Provide each child with a cone and cylinder made with white bristol board, and a pair of paper scissors. Inform students that they are going to be operating on these shapes by slicing them along their faces to see which 2D shapes they are made of. Have students color each type of shape using a different color crayon.

Useful Content Knowledge for the Teacher about the Outcome:

As students are introduced to 3D shapes, they develop common misconceptions with their ability to recognize hidden faces of 3D shapes when looking at 2D perspective diagrams. Therefore, real objects need to be used as manipulatives to help them identify the basic attributes of edges, vertices and faces of shapes. However, it is crucial that students define other characteristics, such as shapes with parallel faces and start classifying shapes according to shared characteristics. One way in which they could solidify their understanding of such characteristics is through shape deconstruction. This can be done in various ways such as slicing, creating shadows and making footprints. As a result, students will need plenty of practice with disassembling three-dimensional (3D) objects so that they can study the 2D shapes used to compose these objects.

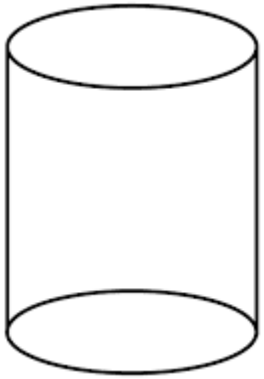
Deconstructing 3D shapes by creating shadows:

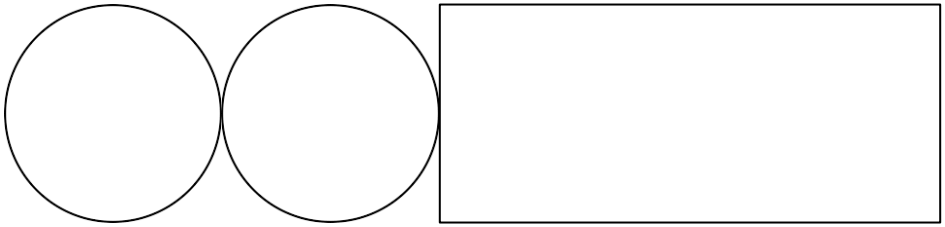


Deconstructing 3D shapes by slicing:

Fig. 1

Fig.2 : After Slicing





Deconstructing 3D shapes by making footprints.

Vocabulary: slicing, deconstructing, shadow, footprints, pyramids, horizontal, vertical, apex, vertices, edges, lateral, faces, similar, prisms, cylinder, bases, circle, rectangle, square, triangle, paste, different

Inclusive Resources and Materials from Regional Specialists

Additional Resources and Materials

- scissors
- different 3D objects in the form of (spheres, cylinders, cones, pyramids, prisms0
- pattern blocks
- paper cut outs of 2D shapes

Books/Literature

Circle! Sphere! Grace Lin
City Shapes by Diana Murphy
Colour Zoo by Lois Ehlert
Cube, Cone , Cylinders and Spheres by Tana Hoban

Opportunities for Subject Integration:

Art and Craft

create collages with footprints of shapes.
creating picture frames.
creating models of 2D shapes after deconstructing 3D shapes.
Creating board and floor games.
Making mural of 3D and 2D shapes.

Science and Technology

Identify, describe and classify objects according to their properties such as size, shape, texture.

Identify different materials and list 2D and 3D shapes made from each.

Social Studies

Collaboration to complete a given chore.
Identifying 2D features in 3D objects in a community.

Language Arts

Compose poems on the deconstruction of 3D shapes.
Create riddles from deconstructed shape (answer must be a constructed 3D shape).

Create booklets on deconstructed shapes.
Communicate (oral and written) how to deconstruct a 3D shape using shadowing, slicing or foot printing.

Music
Compose songs and jingles on the deconstruction of 3D shapes.

Elements from Local Culture:
Slicing logs to make furniture.
Slicing meat or meat products (pepperoni, salami, sausages).

Resources for a learner who is struggling:

Present a teacher-demonstration video of slicing, shadowing and foot printing before students engage in the actual processes of deconstructing a 3D shape.

Resources for a learner who needs challenge:

1. Predict the 3D shapes that will be derived from a deconstructed pile of 2D shapes.
2. Construct a 3D shape after their predictions.

Essential Learning Outcome: Measurement 1.1

Introduction to the Subject:
The measurement strand is mathematically powerful, and it enables the identification and quantification of attributes of objects so that they can be compared and ordered. It plays a crucial role in everyday life and it provides a link among the different strands of mathematics. This grade focuses on linear measurement, mass, capacity, time, and money.
It is important for students to understand linear measurements and their attributes, how to measure them accurately and use the appropriate units and tools of measurement. They will develop the skill to measure objects using units. In this context, students will learn to choose and use non-standard and standard units to measure lengths and also understand the inverse relationship between the size of a unit and the number of units needed to measure a given length. Additionally, students will explore the relationship between centimeters and meters as units of length and use benchmarks to estimate lengths. They will learn to measure, draw and compare lengths in centimeters and meters using measuring tools and recognize the impact of starting points other than zero on the measurement tool.
Further, they will explore the concept of time and learn how it is measured and represented as well as develop the ability to tell time. Moreover, students will understand how to describe the duration of events accurately and make meaningful comparisons. Also, it is very essential that students develop a deep understanding of money and its value. This curriculum will afford students the opportunity to interact with different coins whose sum is less than or equal to one dollar.
Ultimately, Grade two students will gain a deeper understanding of the concept of measurement and how it applies to the world around them by developing these skills.

Strand (Topic): MEASUREMENT

Essential Learning Outcomes 1.1 : Understanding What and How We Measure - Developing an understanding of measurable attributes

Grade Level Expectations:
Choose and use non-standard units appropriately to measure lengths and describe the inverse relationship between the size of a unit and the number of units needed.
Explain the relationship between centimeters and meters as units of length, and use benchmarks for these units to estimate lengths

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
1. Explain in your own words the concept of linear measurement. 2. Differentiate among measurable attributes related to linear measurements (length, width, height, depth and distance). 3. Use vocabulary relating to each attribute (long, short, wide, narrow, deep, shallow, far, tall, near). 4. Describe the term of non-standard units. 5. Use non-standard units (units must be the same size and must be joined from end to end - no gaps) 6. Compare and order measurements using non-standard units of measurement. 7. Choose to use standard and non-standard units for the measurement of linear measurement where appropriate.	**Cloze Exercise** Complete the definition of linear measurement. Level 1: Basic Understanding • The student provides a limited or inaccurate definition of linear measurement. • The response may lack essential components of linear measurement, such as the use of units or the idea of measuring length. • The definition may include vague or incorrect language. Level 2: Developing Understanding • The student demonstrates a partial understanding of linear measurement. • The response includes some key components of linear measurement but may lack clarity or precision. • The definition may include basic concepts like measuring length or using units but may not be fully articulated. Level 3: Proficient Understanding • The student provides a clear and accurate definition of linear measurement. • The response includes all the essential components of linear measurement, such as the use of units (e.g., inches, centimeters) and the concept of measuring length. • The definition is well-expressed and may include examples to illustrate the concept. Scoring Guide: • Level 1: 1-2 points • Level 2: 3 points • Level 3: 4 points	**Discussion and Visual representation** - Provide students with multiple opportunities to develop language and vocabulary about measurable attributes of objects. Allow them to use direct comparison whenever possible. (e.g. longer/shorter, heavier/lighter, etc.) Allow Students to view and discuss pictures and videos that depict linear measurement and their attributes. Allow students opportunities to predict which measurable attribute(s) of given objects can be measured. Give students opportunities to justify their answers. **Demonstration and Modelling** Provide opportunities for students to match and make other comparisons of an attribute with measuring units. (Starting with non-standard, then moving to standard units). For example:

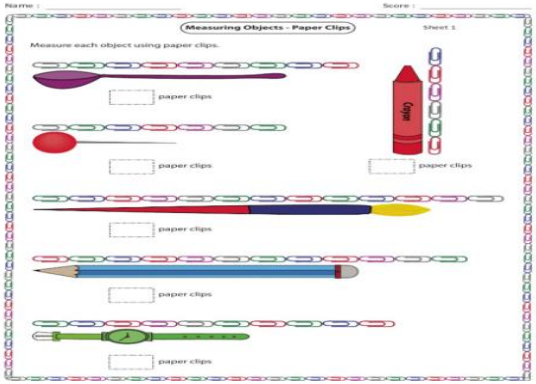
<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr><td></td><td>
Circle the pictures that depict linear measurement.

Projects

Students create measurement scrapbooks to show their understanding of vocabulary related to measurement attributes: long, short ,wide narrow.

Rubric

Create a picture book that shows the different attributes of length. Create a picture book on different lengths and use the correct vocabulary to describe each picture.

<table>
<tr><th>Criteria</th><th>Needs Improvement
Level 1
(3points)</th><th>Satisfactory
Level 2
(5 points)</th><th>Excellent
Level 3
(10 points)</th></tr>
<tr><td>Accuracy of Measurements</td><td>Several measurements are inaccurate, resulting in misleading or incorrect information.</td><td>Most measurements are reasonably accurate, but some minor errors are present.</td><td>All measurements are precise and accurate, providing reliable information.</td></tr>
<tr><td>Organization of the</td><td>The scrapbook table is disorganized,</td><td>The scrapbook table is somewhat</td><td>The scrapbook table is well-organized, with</td></tr>
</table>
</td><td>


Retrieved from: https://www.liveworksheets.com/worksheets/en/Math/Length/Measuring_things_using_non_standard_unit_zk2338801rp

Encourage students to measure the same object using different non-standard units and make comparisons, estimates, connections and justifications.

Field Trips
Allow students to explore their school and surrounding areas, estimate and measure the length of things in their environment and the distance between two points.
Students are given the opportunity to estimate and measure length, height, and distance, using non-standard units, record and represent measurements of length,
</td></tr>
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies				Inclusive Learning Strategies
	Scrapbook Table	with measurements and information scattered and difficult to follow.	organized, but improvements are needed for clarity and coherence.	measurements and information presented in a clear and logical manner.	height, and distance in a variety of ways (e.g. concrete, pictorial, written) on field trips. **Investigation** • Allow students to build towers using blocks and provide them with non-standard units of varying lengths. • Record and compare their measurements. • Discuss their findings. • Make a generalization on the relationship between the size and number of units. • Students are provided with toy cars, they predict which car will go the furthest. Cars are allowed to be driven, students estimate distance covered then measure and record. Students make predictions, estimate and measure the following: • Is there a relationship between height and length of feet? • Who has the largest/smallest head in the class? • Is there a relationship between hand span and footprints ?
	Creativity and Visual Appeal	The scrapbook table lacks creativity and visual elements, appearing dull and unengaging.	Some attempts at creativity and visual appeal are made, but more decorative elements could be added.	The scrapbook table is creatively designed, visually appealing, and includes appropriate decorations and illustrations.	
	Use of Appropriate Units	Incorrect or inconsistent units are used throughout the scrapbook table.	Most units used are appropriate, but there are a few instances of inconsistency or errors.	The correct and consistent units of measurement are used for all data in the scrapbook table.	

<table>
<tr><th>Specific Curriculum Outcomes</th><th>Inclusive Assessment Strategies</th><th>Inclusive Learning Strategies</th></tr>
<tr>
<td></td>
<td>
Attribute Scavenger Hunt: Create a list of locations or objects that exemplify each attribute.

For example, for "long," students could find a pencil or a hallway; for "wide," they could find a table or a river.

Attribute Sorting Game: Prepare a collection of objects or picture cards that represent various attributes. Students are required to sort them based on their attributes.

For example, they could sort pictures of different animals into groups of long, short, wide, and narrow. This activity encourages students to identify and categorize objects based on their attributes.

Measurement Stations: Organize different stations with measuring tools such as rulers, measuring tapes, or even their own feet. At each station, provide objects or examples that represent different attributes, and have students measure and record the corresponding attribute. For example, at the "tall" station, they could measure and record the height of different objects.

Scoring Rubric for Measurement Stations:
<table>
<tr><th>Criteria</th><th>Level 1
(1-2 points)</th><th>Level 2
(3-4 points)</th><th>Level 3
(5-6 points)</th></tr>
<tr><td>Accuracy of Measurements</td><td>Inaccurate or inconsistent measurements with significant errors.</td><td>Mostly accurate measurements with a few minor errors.</td><td>Consistently precise and accurate measurements</td></tr>
</table>
</td>
<td>
Guided Discovery Learning

Students are provided with centimetre cubes and metre strips etc. along with guided questions so that students can understand the relationship between centimetre and metre.

Use of manipulatives and visual representation
Teacher presents visual representation of a metre through the use of videos, metre stick or rule, tapeline, papered metre and posters . https://www.youtube.com/watch?v=Mt8VjQEo9h0
Allow students to relate the number of footsteps and hand length to a metre.

Provide students with centimeter cubes or strips that they can manipulate.

Match metre strips and centimetre cubes to lengths in the environment.

Identify lengths in the environment that represent a metre and centimetre.
</td>
</tr>
</table>

Specific Curriculum Outcomes	Inclusive Assessment Strategies				Inclusive Learning Strategies
				with minimal errors.	
	Following Instructions	Struggles to follow instructions at the station and requires significant assistance.	Partially follows instructions with some assistance.	Independently follows instructions accurately.	
	Problem-Solving and Reasoning	Demonstrates limited problem-solving skills and struggles to reason through measurement tasks.	Exhibits some problem-solving abilities and basic reasoning skills.	Applies advanced problem-solving and reasoning skills effectively.	
	Collaboration and Communication	Rarely engages with peers or communicates measurement findings effectively.	Collaborates with peers but may have difficulty communicating measurement findings.	Actively collaborates with peers and communicates measurement findings clearly.	
	Overall Presentation	Messy and disorganized presentation with	A somewhat organized and neat	A well-organized and visually	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies

	little attention to detail.	presentation with some attention to detail.	appealing presentation with great attention to detail.

Attribute Pictionary: Divide the class into small groups. Provide each group with a set of attribute vocabulary cards. One student from each group picks a card and without speaking, must draw a representation of the attribute on the board. The group members try to guess the attribute being depicted.
This activity encourages creativity and reinforces vocabulary and understanding.

Attribute Relay Race: Set up a relay race with different stations representing each attribute. For example, at the "far" station, students could throw a ball as far as they can, or at the "deep" station, they could fill a container with water as deeply as possible. Divide the class into teams, and each team member takes turns completing a task at each station. The team that finishes all the attribute tasks first wins the race.

Attribute Building Blocks: Provide students with building blocks or other construction materials. Students are instructed to build structures that represent each attribute. For example, they could build a tall tower, a long bridge, or a narrow pathway. Encourage students to use their creativity and spatial awareness while constructing and describing their creations.

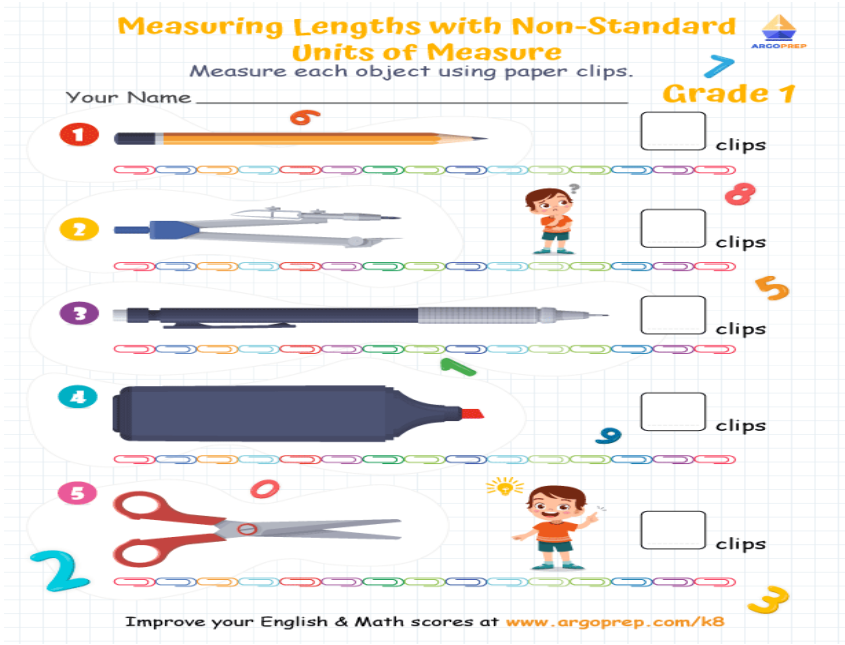
Observational Checklist
Use a checklist to assess students as they use given non-standard units to measure objects in the classroom.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies

Students are observed using a checklist as they engage in hands-on measurement activities using non-standard units.
Focus should be placed on estimation skills, accuracy in measuring, and their ability to use appropriate units.
Students should be observed using a checklist as they represent their measurements in concrete, pictorial, and written forms.
Student Name: _____
Date: _____
Activity: Measurement Using Non-Standard Units

Criteria	Yes	Partially	No
Accurately Measures Objects			
- Measures with Consistency			
- Uses Non-Standard Units Correctly			
- Makes Few Errors in Measurements			
Follows Instructions			
- Listens Carefully			
- Follows Step-by-Step Directions			
- Asks Clarifying Questions			
Problem-Solving and Reasoning			
- Makes Logical Decisions			
- Uses Estimation Skills			
- Explains Reasoning Clearly			
Collaboration and Communication			
- Works Well with Peers			
- Shares Ideas and Contributions			
- Communicates Findings Clearly			

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Engagement and Participation - Actively Participates - Shows Enthusiasm for the Activity - Stays Focused and On-Task Notes/Comments **Paper and pencil** Pupils are given worksheets to complete the following: Students select appropriate non standard units to measure the length of given objects and pictorial representations, then record and compare the lengths. Students choose to use standard and non-standard units for the measurement of linear measurement where appropriate.	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Example:  https://argoprep.com/worksheet/length-non-standard-units_1/ **Portfolio** Create a portfolio of students' work that showcases their ability to estimate, measure, and represent measurements in various ways. Include samples of their concrete models, pictorial representations, and written explanations. Evaluate their growth and progress over time and provide feedback on their strengths and areas for improvement.	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies

Scoring Guide:

Level 1: 0-5 points, Level 2: 6-10 points, Level 3: 11-15 points, Level 4: 16-20 points

Criteria	Level 1 Below Expectations	Level 2 Approaching Expectations	Level 3 Meets Expectations	Level 4 Exceeds Expectations
Estimation Skills	Demonstrates little or no understanding of estimation.	Attempts to estimate but with significant inaccuracies.	Makes reasonable estimations for some objects, with occasional errors.	Consistently makes accurate estimations for various objects.
Measurement Using Non-Standard Units	Struggles to use non-standard units effectively for measurement.	Uses non-standard units with some inconsistencies.	Mostly uses appropriate non-standard units to measure objects.	Accurately and consistently uses non-standard units for measurement.
Measurement Using Standard Units	Limited or no understanding of standard units of measurement.	Demonstrates basic understanding but with frequent errors.	Uses standard units with some accuracy and understanding.	Proficiently uses standard units for measurement with minimal errors.
Representation of Measurements	Represents measurements with little or no organization or clarity.	Attempts to represent measurements, but organization and clarity need improvement.	Mostly represents measurements in a clear and organized manner.	Represents measurements effectively, with a high level of clarity and organization.
Variety of Measurement Tasks	Presents only a few types of	Includes a limited variety of	Includes a reasonable variety of	Showcases a wide range of measurement

Specific Curriculum Outcomes	Inclusive Assessment Strategies					Inclusive Learning Strategies
		measurement tasks.	measurement tasks.	measurement tasks.	tasks, demonstrating depth and creativity.	
	Mathematical Reasoning	Demonstrates minimal or no mathematical reasoning in measurement.	Makes some attempts at mathematical reasoning but lacks coherence.	Shows logical mathematical reasoning in most measurement tasks.	Demonstrates sophisticated mathematical reasoning and connections across tasks.	
	Neatness and Presentation	Portfolio is messy and lacks attention to presentation.	Some parts of the portfolio are neat and well-presented.	Portfolio is mostly neat and well-organized.	Portfolio is exceptionally neat, visually appealing, and carefully organized.	

Useful Content Knowledge for the Teacher about the Outcome:

Linear measurement refers to the measurement of length or distance between two endpoints of an object. It simply means the length of a straight line segment. Linear measurement includes the measurement of length, width, height and depth.

Non-standard units are items in the environment that are used for measurement.

The standard units must be of the same size. When using non-standard units to measure, there should be no overlaps and gaps.

The size of the unit determines the number of units used.

Measurement procedures

Identify starting and end point of the line.

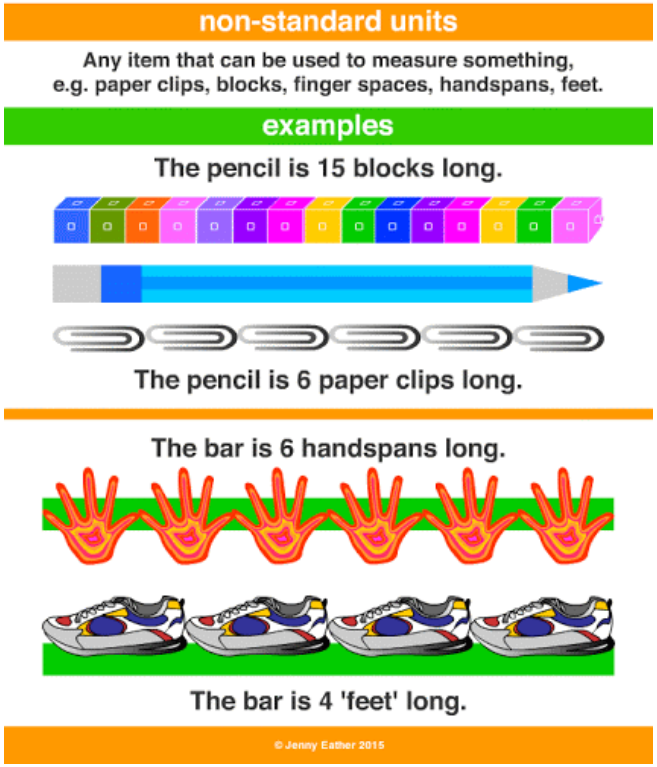
Place the first unit at the starting point.

Add other units to reach the endpoint and ensure there are no gaps or overage.

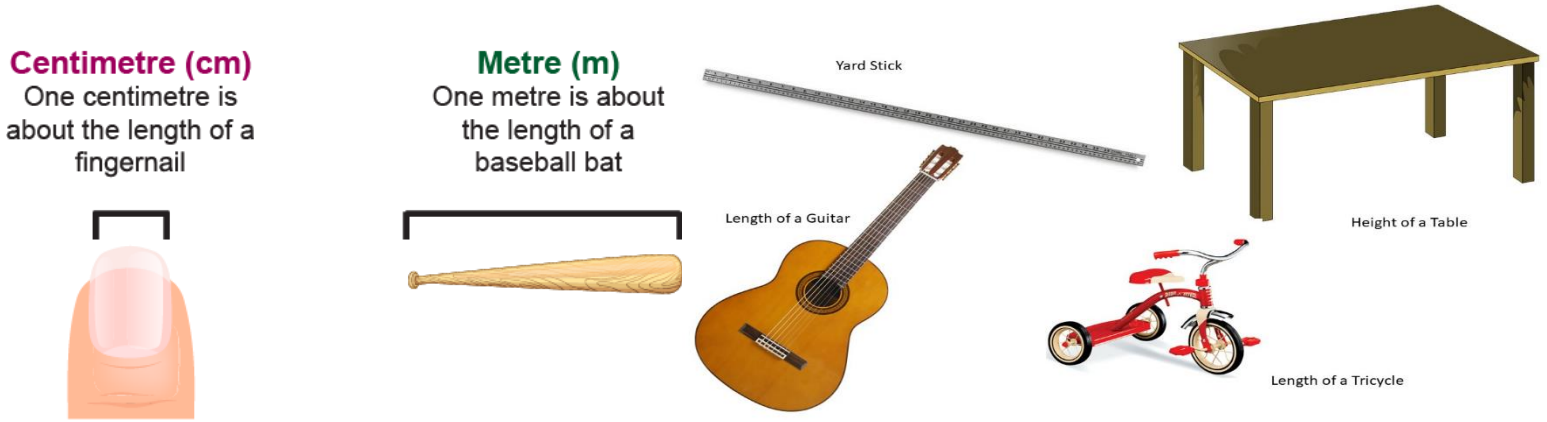
Count the number of units.

Standard units have a fixed size. Some standard units are metres and centimetres.

Metres are 100 times bigger than centimetres.

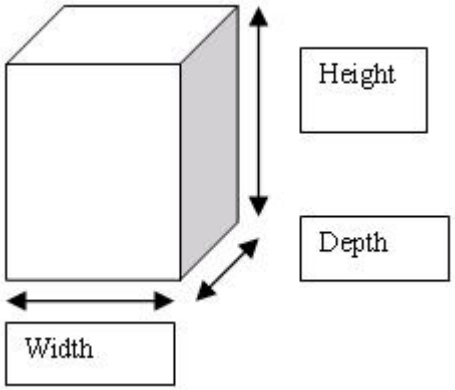


https://dcaclassroomportal.com/courses/grade-2-math-skills/lessons/september-measurement-distinguish-between-a-non-standard-and-standard-forms-of-length-2/topic/what-are-standard-and-non-standard-forms-of-length/

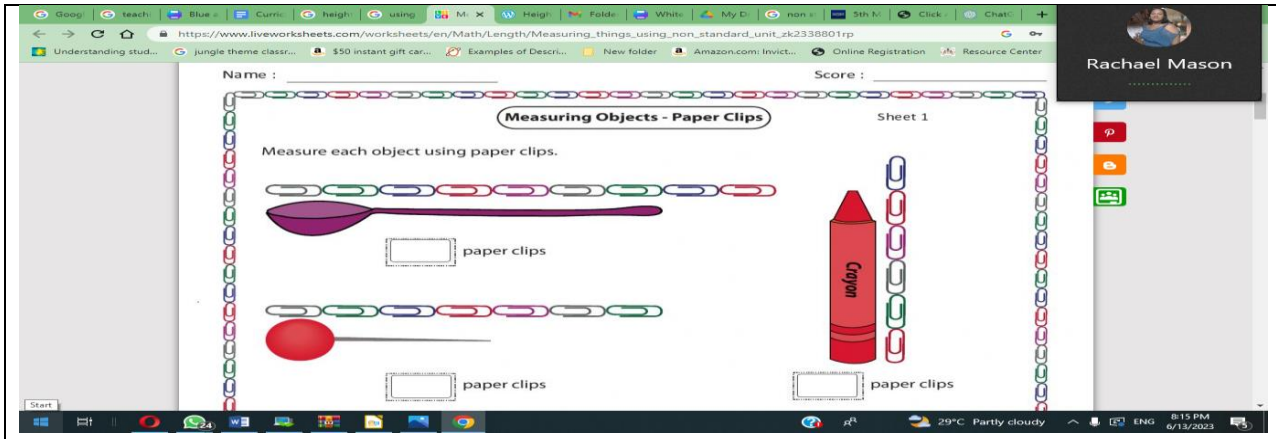


https://teacher.desmos.com/activitybuilder/teacherguide/5fef3d7afdb1f00d40145078

Length : is the measurement that describes how long an object is. The total gap measured between the leftmost and rightmost end of an object.
Height : is the linear measurement between the top and bottom of an object.
Width : the horizontal measurement or distance measured from side to side.
Depth : is a measurement of how far back a three-dimensional object is.
Distance: between two points as the length of the line segment that connects the two given points.



https://roadswithforks.wordpress.com/2017/04/24/height-and-length-width-and-length-height-and-width/



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

Additional Resources and Materials

Paperclips: Measure lengths in terms of the number of paperclips needed to span an object.
Popsicle sticks: Use popsicle sticks as a unit of measurement to measure lengths.
Straws: Measure lengths by counting the number of straws needed to cover an object.
Rubber bands: Stretch rubber bands along the length of an object and count the number of bands required.
Cubes or blocks: Use small cubes or blocks as units to measure lengths.
Clothespins: Clip clothespins end to end to measure the length of an object.
Thumb widths: Use the width of your thumb as a unit to estimate and measure lengths.
Hand spans: Measure distances using the span of your hand, from the tip of the thumb to the tip of the pinky finger.
Footsteps: Measure distances by counting the number of footsteps it takes to cover a certain length.
Books: Stack books on top of each other to measure lengths.
Pencil lengths: Use the length of a pencil as a unit to measure objects.
Strides: Measure distances by counting the number of strides or steps it takes to cover a certain length.

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

Science : Pupils should be able to use non standard units to measure the distance objects move when they are pulled or pushed.

Art Pupils should be able to draw landmarks in the community.
Pupils should be able to sketch an outline/layout of the local community.
Pupils should be able to use plasticine to create a model of their community.

Social Studies: Pupils should be able to use nonstandard units to measure the height of import buildings and the distance between the landmarks on models created.

Language Arts: Pupils should be able to create a scrap book on linear measurement.
Pupils use vocabulary related to linear measurement to describe the pictures and make comparisons.

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

Here are some real environment examples for teaching students to use non-standard units appropriately to measure lengths, and describe the inverse relationship between the size of a unit and the number of units needed.

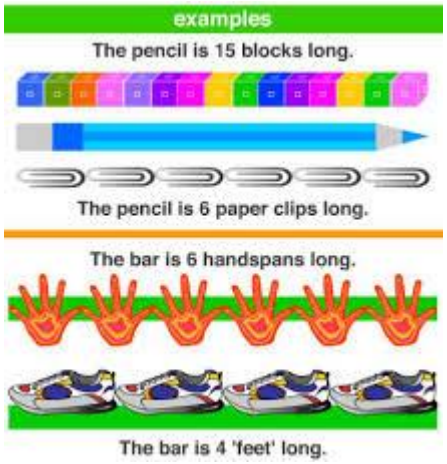
Provide students with opportunities to engage in hands-on activities that involve non-standard units. For instance, they can use local natural materials like stones, seeds, shells or footprints to measure length. They can also explore their own bodies as measurement tools, using their footsteps or arm spans to measure distances.

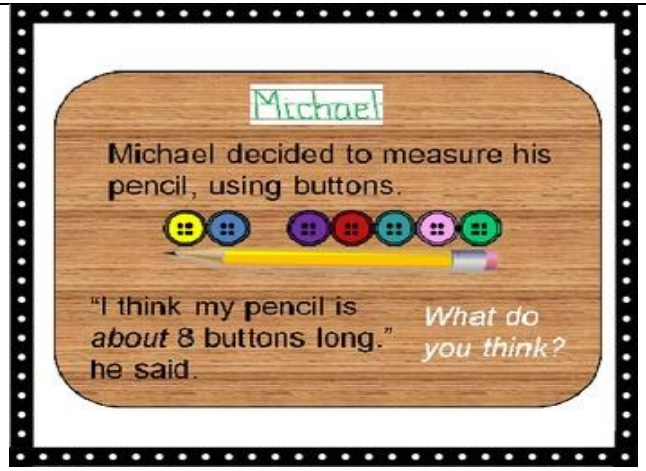
Cultural stories and narratives: Share cultural stories or folk tales that involve nonstandard units of measurement. These stories can help students understand the historical and cultural significance of these units. Encourage discussions and reflections on how these units are embedded in the local culture's traditions, values, and ways of life.

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 2 students who may be struggling with using non-standard units appropriately to measure lengths and describe the inverse relationship between the size of a unit and the number of units needed.

Hands-on Activities: Struggling students often benefit from hands-on activities. You can use manipulatives such as blocks, button and sticky notes to measure.





http://www.stmaryscatholicprimarytelford.co.uk/media/1557/year-four-home-learning-pack-spring-4-part-2.pdf
https://www.teacherspayteachers.com/Product/Measuring-with-Stuff-Using-Non-Standard-Units-79878

Students use sticky notes to measure how tall their friends are.

Line up snacks and measure students foot and hands and other things in the environment.

How many gummy bears long is your foot? Your hand?

Visual Aids: Using visual aids such as pictures, diagrams, and posters can help struggling students understand the concepts better. Posters with pictures displaying non-standard units.

Simple Worksheets: For struggling students, using 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: Use online games and activities that can be used to help struggling students learn about measuring attributes (length, width ,height and depth).

https://www.splashlearn.com/math/measurement-games-for-2nd-graders
https://pbskids.org/games/measurement
https://www.iknowit.com/lessons/k-measurement-non-standard-units.html
Small Group Instruction: Struggling students often benefit from small group instruction. Create small groups of students and work with them on specific concepts. This will allow for the provision of individualized instruction and support to each student.

Resources for a learner who needs challenge: *(Links to learning activities and resources in later grades)*
There are several resources available for grade 2 students who use non-standard units appropriately to measure lengths, and describe the inverse relationship between the size of a unit and the number of units needed.
Advanced Worksheets: For students who are ready for a greater challenge, you can use more advanced worksheets that focus on the use of non-standard units appropriately to measure lengths, and describe the inverse relationship between the size of a unit and the number of units.
https://www.iknowit.com/lessons/k-measurement-non-standard-units.html
Problem-Solving Activities: Problem-solving activities can be used to challenge grade 2 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.
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 2 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.

Essential Learning Outcome: Measurement 1.2

Introduction to the Subject:

The measurement strand is mathematically powerful, and it enables the identification and quantification of attributes of objects so that they can be compared and ordered. It plays a crucial role in everyday life and it provides a link among the different strands of mathematics. This grade focuses on linear measurement, mass, capacity, time, and money.

It is important for students to understand linear measurements and their attributes, how to measure them accurately and use the appropriate units and tools of measurement. They will develop the skill to measure objects using units. In this context, students will learn to choose and use non-standard and standard units to measure lengths and also understand the inverse relationship between the size of a unit and the number of units needed to measure a given length. Additionally, students will explore the relationship between centimeters and meters as units of length and use benchmarks to estimate lengths. They will learn to measure, draw and compare lengths in centimeters and meters using measuring tools and recognize the impact of starting points other than zero on the measurement tool.

Further, they will explore the concept of time and learn how it is measured and represented as well as develop the ability to tell time. Moreover, students will understand how to describe the duration of events accurately and make meaningful comparisons. Also, it is very essential that students develop a deep understanding of money and its value. This curriculum will afford students the opportunity to interact with different coins whose sum is less than or equal to one dollar.

Ultimately, Grade two students will gain a deeper understanding of the concept of measurement and how it applies to the world around them by developing these skills.

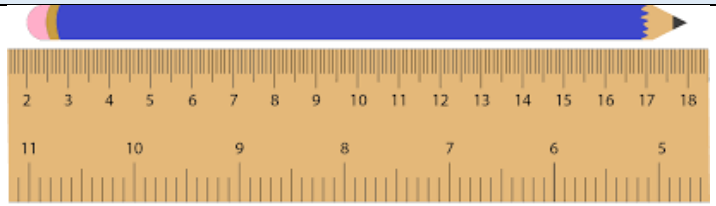
Strand (Topic): MEASUREMENT

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

Grade Level Expectations:

Measure and draw lengths in centimetres and metres, using a measuring tool, and recognize the impact of starting at points other than zero.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
1. Estimate and measure length, height, and distance, using standard units (i.e. centimetre, metre); 2. Record and represent measurements of height, and distance length using a variety of ways (e.g. concretely, pictorial, written). 3. Use a measuring tool such as a ruler or a tape measure, in both centimetres and metres to measure length, height and distances. 4. Identify the starting point of a measuring tool. 5. Recognize and use the abbreviations "cm" and "m" when measuring and recording lengths. 6. Create real life scenarios that involve measuring lengths, height and distances.	**Paper and pencil activities** Pupils use their benchmarks to assist them in estimating the lengths of identified objects in the classroom and the lines on a given worksheet. **Observation Checklist** Checklist is used to assess students as they measure the length of objects in the classroom or their surroundings and height, length, width of given pictures. ***sample rubric*** ***Measuring Tools:*** Uses appropriate measuring tools such as rulers, measuring tapes, or non-standard units like paper clips or hand spans. ***Measurement Units:*** Understands the concept of standard units of measurement like centimeters (cm) and inches (in). Knows how to use non-standard units consistently, such as using the same object or body part for measuring. ***Length Measurement:***	**Visual Representations**: Use visual aids such as diagrams, charts, or number lines to illustrate the concept of measuring lengths, starting and ending points. These visuals can help students visualize the impact of starting at different points and understand how it affects measurements.  https://www.google.com/search?q=starting+and+ending+points+in+measurement+of+length&tbm=isch&ved=2ahUKEwjEi9flp-f_AhWmjrAFHZ0YDHAQ2-cCegQIABAA&oq=starting+and+ending+points+in+measurement+of+length&gs_lcp=CgNpbWcQAzoECCMQJ1D6D1juSmDnV2gAcAB4AIABeYgB5QmSAQQwLjExmAEAoAEBqgELZ3dzLXdpei1pbWfAAQE&sclient=img&ei=DdycZITRAaadwt0PnbGwgAc&bih=625&biw=1366&rlz=1C1GCEA_enGD936GD936

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Aligns the beginning of the object with the zero point and reads the measurement at the end of the object. ***Height Measurement:*** Measures the height of objects accurately, using the same principles as length measurement. ***Width Measurement:*** Measures the width of objects accurately, using the same principles as length measurement. ***Picture Measurement:*** Measures the height, length, and width of given pictures accurately, using appropriate measuring tools and units. ***Recording Measurements:*** Records measurements neatly and correctly in the appropriate units (cm, in, or non-standard units). ***Comparing Measurements:*** Demonstrates an understanding of comparative measurement by comparing lengths, heights, and widths of different objects or pictures.	 https://docs.google.com/document/d/1Ic6XFFJ0EoAb8xs8dCl-scnvflqA7u5p/edit **Demonstration and guided practice** Teacher models the measurement procedure and students are given the opportunity to demonstrate their understanding of measurement. **Hands-on activities:** Provide students with various measuring tools such as rulers, tape measures, or meter sticks which has starting points other than zero. Engage students in hands-on activities where they measure objects in the classroom or their surroundings. Encourage them to use centimeters for shorter lengths and meters for longer lengths. **Collaborative learning** Encourage peer collaboration and cooperative learning through play. Pair students with different abilities together, so they can support each other during measurement activities. This promotes a sense of inclusivity and fosters a supportive learning environment. **Problem Based Learning**

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Estimation: Makes reasonable estimates before measuring to develop a sense of measurement. ***Problem Solving:*** Applies measurement skills to solve simple problems or real-life scenarios, such as finding the total length of multiple objects or determining the size difference between two pictures. **Peer assessment** Teacher and students create a checklist and students use this tool to assess their peers as they measure. **Open-Ended Tasks** Include open-ended tasks that allow for creativity and critical thinking. For example, ask students to measure and draw a path on a map, considering different starting points. This encourages them to think about the impact of starting points on measurements in a broader context. **Rubric** Use a rubric to assess to students as they build the box and the finished product **<u>Accuracy of Dimensions</u>** **Exemplary (4)**	**Provide students with tasks of varying levels of difficulty to stimulate reasoning and problem solving. For example:** John wants to make a gift box for the birthday present he bought his brother. How can they help John? Students collaborate, and are given the height, length and width of the gift and they must use building blocks to construct a box that can hold it. **Scenario :** Present students with the following scenario: • A friend wants to measure the length of some shapes but can only find a centimetre ruler with the ends broken off. *What advice would you give to your friend about making accurate measurements with this ruler?* **Project Based Learning** Have students create their own linear measuring tools using materials from the environment (sticks, vine) Ask them to compare their measuring tool to a ruler. Students use their measuring tool to draw a variety of specified lengths and measure the length of a variety of objects to the closest centimetre.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	The student constructs a box that accurately matches the given dimensions of the gift, with minimal error. **Proficient (3)** The student constructs a box that mostly matches the given dimensions of the gift, with minor errors. **Developing (2)** The student constructs a box that somewhat matches the given dimensions of the gift, but with noticeable errors. **Emerging (1)** The student constructs a box that does not accurately match the given dimensions of the gift. **Creativity** **Exemplary (4)** The student demonstrates exceptional creativity by adding unique and imaginative design elements to the gift box. **Proficient (3)**	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	The student demonstrates creativity by incorporating some original design elements to the gift box. **Developing (2)** The student attempts to add some creative design elements to the gift box, but they are limited or lacking in originality. **Emerging (1)** The student shows little to no creativity in the design of the gift box. **<u>Craftsmanship</u>** **Exemplary (4)** The student's gift box is neatly and skillfully constructed, showing attention to detail and a high level of craftsmanship. **Proficient (3)** The student's gift box is reasonably well-constructed, with some attention to detail and overall good craftsmanship. **Developing (2)**	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	The student's gift box is somewhat messy or unrefined, with limited attention to detail and craftsmanship. **Emerging (1)** The student's gift box is poorly constructed, messy, and lacks attention to detail and craftsmanship. **<u>Presentation</u>** **Exemplary (4)** The student presents the gift box in a clear, organized, and visually appealing manner, considering factors such as color, decorations, and overall presentation. **Proficient (3)** The student presents the gift box in a relatively clear and organized manner, with some consideration given to color, decorations, and presentation. **Developing (2)** The student's presentation of the gift box is somewhat disorganized or lacks attention to visual appeal, with limited consideration given to color, decorations, and overall presentation. **Emerging (1)**	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	The student's presentation of the gift box is disorganized, lacks visual appeal, and shows little consideration for color, decorations, and overall presentation.	

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*)

- Rulers, measuring tapes, tape measures – all measuring tools – replace the need to lay out and count actual physical units. The measuring tool repeats the unit so there are no gaps or overlaps and includes a scale to keep track of the unit count.
- When the edge of an object is matched with the 0 mark on the measuring tool, the scale accurately keeps track of the count. However, a length can be measured from any starting point, as long as the count is adjusted based on the starting point to accurately reflect the length of the object.
- The distance between two end points stays constant, no matter where on the scale the count begins. A measurement counts the number of units between the start of a length and the end of a length.

To determine the length of an object on a broken ruler - subtract the smaller number at the starting point from the larger number at the end point

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

- Manipulatives
- Visual aids
- Online resources
- Books and literature

Additional Resources and Materials

Virtual games and worksheets

https://www.cuemath.com/measurement/measuring-length/

https://www.k5learning.com/free-math-worksheets/first-grade-1/measurement/longer-shorter

httphttps://www.education.com/worksheets/second-grade/measuring-in-meters/s://vitrek.com/mti-instruments/knowledge-center/15-measurement-activities-for-students/

https://www.teachingexpertise.com/classroom-ideas/ideas-for-teaching-measurement/

https://www.abcya.com/games/measuring

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

Science: Students should find the length, width and height as they design and construct a simple object using chosen materials.

Social Studies : Students should be able to demonstrate cooperative behaviour as they work as a group to find the length, width and height of objects.

Language Arts and Social Studies Students write descriptive sentences about themselves that tells about their height and width.

Create a video explaining the procedure of measurement using a broken ruler.

Art and Craft: Constructing measuring tool using local materials.

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

Use items from the environment to construct measuring tool - sticks, straw and vines.

Measure objects that they use in their everyday life.

Measure the distance the ball travels when students playing cricket and football.

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

Accommodations and Modifications: Offer accommodations and modifications as necessary for students with special needs. This could include providing larger or tactile measuring tools, adjusting the starting points, or offering alternative assessment formats.

Hands-on Activities:

- Create a measurement station which enables students to measure varied attributes of objects.
- Use building blocks to create towers of different heights.
- Use interactive measuring app on phones and tablets.
- Real life measurement activities.
- Educational videos and games.

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

- Measure objects on worksheets, use appropriate vocabulary to compare the length of the objects and calculate the difference of the height width and length of objects.
- Projects whereby students are given the opportunity to construct a home using ice lolly sticks for the pet with given heights, length and width.
- Students are given the opportunity to create a video on measuring, using measuring tools with starting points other than zero.

Strategies that Support the Curriculum and Assessment Framework

Elements that are integrated across subjects:

Distance of objects when force acts upon them.

Determine and describe their height and width.

Determine and describe the length of their feet.

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

Play local games such as:

- cricket, football - Measure the distance the ball and players traveled.

- volleyball - Measure the distance among players.
- chiny skip - Measure the height each person jumped.

Introduction to the Subject:
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Further, they will explore the concept of time and learn how it is measured and represented as well as develop the ability to tell time. Moreover, students will understand how to describe the duration of events accurately and make meaningful comparisons. Also, it is very essential that students develop a deep understanding of money and its value. This curriculum will afford students the opportunity to interact with different coins whose sum is less than or equal to one dollar.
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Strand (Topic): MEASUREMENT

Essential Learning Outcome 1.3: Understanding What and How We Measure - Developing and applying non-standard units of measure

Grade Level Expectation: Use units of time, including seconds, minutes, hours, and non-standard units, to describe the duration of various events.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
1. Identify the appropriate unit of time such as seconds, minutes, hours, days etc. to describe a given activity or event.	**SCO1** **Sorting and Categorizing:** Provide a set of activity cards or pictures and ask students to sort them into categories based on the appropriate unit of time. For instance, they could sort cards representing activities like reading a book, baking cookies, or sleeping, into categories such as seconds, minutes, or hours.	**SCO1** **Storytelling and Narrative:** Use stories or narratives to provide context and make the concept of time more relatable. Share stories about daily routines, events, or historical figures to demonstrate the use of different units of time. Students can then identify and discuss the appropriate unit of time used in the story.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
2. Create a time log of a daily activity using a specified unit(s) of time. 3. Compare the time taken to complete two or more given activities using non-standard units. (number of claps, number of jumps, number of steps it takes to complete some thing). 4. Use seconds, minutes, and hours to measure and describe the duration of various events. 5. Compare and order the durations of different events using terms such as shorter, longer, and equal. 6. Solve simple addition and subtraction problems involving duration of time. 7. use appropriate vocabulary to describe time such as "seconds," "minutes," "hours," "shorter," "longer,"	**Multiple Choice Questions:** Present students with a series of questions where they need to choose the correct unit of time from a set of options. For instance, give a question like, *"Which unit of time would you use to measure how long it takes to eat lunch*: A) Seconds B) Minutes C) Hours?" This format allows for assessment of students understanding and provides options for differentiation. **SCO2** **Peer Assessments:** Implement peer assessments where students exchange and evaluate each other's time logs. Provide specific criteria or a rubric to guide the assessment process. This strategy promotes collaboration, communication, and critical thinking as students evaluate and provide feedback on their peers' work. ***Sample rubric*** Category: Effort 2: Demonstrated Effort • An effort to create a time log. • The time log is complete and has relevant details. • The student tried their best to accurately assign time intervals. 1: Limited Effort • The student's effort in creating a time log is small. • The time log may be incomplete or has little relevant details. • The student did not show a clear attempt to accurately assign time intervals.	Provide students with the opportunity to choose which activities is most suitable for the given time (minutes, seconds, hours, days, weeks, months and years) Allow students to complete simple tasks within the classrooms to compare the time taken to complete the different activities using nonstandard units of measurement. For example, it takes more or less claps to complete the task. **SCO2** **Personalization and Choice:** Allow students to choose a daily activity they are interested in and would like to track. By giving them the freedom to select their activity, they will be more motivated and engaged in the learning process. This personalization aspect caters to their individual interests and promotes ownership of their time log. **SCO3** **Hands-On Measurement:** Provide students with non-standard units of measurement such as claps, jumps, or steps. Engage students in measuring the time taken to complete different activities using these units. For example, ask students to clap or jump while timing themselves and determine how many claps or jumps it takes to complete a task. This hands-on approach helps

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
"earlier," and "later," among others.	Categories of accuracy and clarity can also be used. **SCO3** **Performance Tasks:** Design performance tasks where students have to complete given activities and measure the time using non-standard units. For example, provide a set of activity cards and ask students to complete each activity while measuring the time in claps, jumps, or steps. Students can then compare the durations and record their findings. **SCO 4,5,6,7** **Observational Assessments:** Observe students as they engage in activities that involve comparing and ordering durations. Take notes on their reasoning, use of appropriate terms, and accuracy in their comparisons. This form of assessment provides valuable insights into students' understanding and allows for individualized feedback. **Real-Life Scenarios:** Present real-life scenarios to students and ask them to compare the durations of different events within the context of those scenarios. *For example*, provide a scenario involving two activities and ask students to determine which one takes longer. This connects the concept of duration to everyday experiences and enhances relevance.	students develop a sense of time and supports their understanding of comparing durations. **SCO4,5,6,7** **Movement Activities:** Incorporate movement-based activities to help students internalize the concept of duration. For example, ask students to line up in order of height, shortest to tallest, or arrange themselves based on the length of time it takes them to complete a task. These activities provide a kinesthetic experience and reinforces the understanding of comparing and ordering durations. **Real-Life Connections:** Connect the concept of comparing and ordering durations to real-life situations. Discuss examples from students' daily lives, such as the time it takes to brush their teeth versus the time it takes to have breakfast. By relating the concept to familiar experiences, students can better grasp the concept and apply it to different contexts.

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*

1. Introduction:
    - Time is a way to measure how long something takes.
    - Introduce the concept of units of time, such as seconds, minutes, and hours.
    - Non-standard units, like claps or jumps, can also be used to measure time in a different way.
2. Seconds:
    - Define a second as a very short unit of time.
    - Examples of events that typically last for seconds, such as blinking or saying a single word.
    - Get to students to think about how many seconds it takes to complete different quick activities.
3. Minutes:
    - Define a minute as a longer unit of time made up of 60 seconds.
    - Examples of events that usually take minutes, such as brushing teeth or reading a short story.
    - Engage students in estimating and discussing how many minutes different activities might take.
4. Hours:
    - Introduce an hour as an even longer unit of time made up of 60 minutes.
    - Examples of events that typically last for hours, such as a long car ride or a movie.
    - Encourage students to think about how many minutes or seconds are in an hour.
5. Non-Standard Units:
    - Explain that we can also measure time using non-standard units, which are different from seconds, minutes, or hours.
    - Introduce examples of non-standard units, such as claps, jumps, or steps, and explain how they can be used to measure time.
    - Engage students in activities where they measure the time it takes to complete tasks using non-standard units.
6. Practice Activities:
    - Provide a variety of activities for students to practice using units of time.
    - Ask students to estimate and record the duration of different events using seconds, minutes, or hours.
    - Include opportunities for students to use non-standard units, such as claps or jumps, to measure and compare durations.
7. Application:
    - Present real-life scenarios or situations where students can apply their understanding of units of time.
    - Ask students to describe the duration of specific events or activities using appropriate units of time.
    - Encourage students to use both standard units and non-standard units to describe durations creatively.
8. Review and Reflection:
    - Recap the key concepts learned about units of time, including seconds, minutes, hours, and non-standard units.
    - Provide opportunities for students to reflect on their learning and discuss how they can use their knowledge of time measurement in everyday situation

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

Elements from Local Culture:

1. Carnival Celebrations:
    - Explain that Carnival is a vibrant and festive event celebrated in many Caribbean countries.
    - Discuss how Carnival lasts for several hours or even a whole day.
    - Encourage students to imagine and describe the duration of different activities during Carnival, such as parades, dancing, and music performances.
2. Traditional Dances:
    - Introduce traditional Caribbean dances, such as the salsa or merengue.
    - Discuss the duration of dance performances and how dancers move to the rhythm for a certain amount of time.
    - Provide examples of how dancers might count beats or steps to keep track of time while performing.
3. Cooking Traditional Foods:
    - Discuss traditional Caribbean dishes and explain that some recipes require specific cooking times.
    - Show pictures or videos of Caribbean dishes being prepared.
    - Ask students to estimate how long it might take to cook a particular dish or describe the duration of the cooking process.
4. Outdoor Games and Sports:
    - Highlight popular Caribbean outdoor games or sports, such as cricket or dominoes.
    - Explain that these activities have specific time limits or durations, such as the number of overs in cricket or the time it takes to complete a game of dominoes.
    - Engage students in discussions about how long these games might last and how players keep track of time during the game.
5. Music and Drumming:
    - Introduce traditional Caribbean musical instruments, such as steel drums or maracas.
    - Explain that musicians and drummers play music for a certain period of time during performances or events.
    - Encourage students to imagine themselves playing a musical instrument and describe the duration of their performance.
6. Festivals and Celebrations:
    - Discuss different Caribbean festivals and celebrations, such as Diwali or Emancipation Day.
    - Explain that these events often have specific start and end times or last for a specific number of days.
    - Engage students in conversations about the duration of these festivals and the activities that take place during them.

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

1. Interactive Online Games and Activities:
   - Websites like ABCya (www.abcya.com) and Education.com (www.education.com) offer interactive games and activities focused on time measurement for grade 2 students. These games provide engaging practice in a fun and interactive format.
2. Time Measurement Worksheets:
   - Education.com and Super Teacher Worksheets (www.superteacherworksheets.com) offer printable worksheets specifically designed for grade 2 students to practice using units of time. These worksheets include activities for measuring time in seconds, minutes, hours, and non-standard units.
3. Time Measurement Books:
   - Look for children's books that explain the concept of time measurement in a simple and engaging manner. Some recommended titles include "What Time Is It, Mr. Crocodile?" by Judy Sierra and "Telling Time with Big Mama Cat" by Dan Harper. These books can help reinforce the concept through storytelling.
4. Educational Apps:
   - Educational apps such as Telling Time for Kids (available on iOS and Android) or Khan Academy Kids (available on iOS, Android, and web) offer interactive lessons, quizzes, and games that specifically target time measurement skills for grade 2 students.
5. Time Measurement Videos:
   - Online platforms like YouTube have educational videos that teach time measurement to grade 2 students. Look for channels such as Mathantics or Homeschool Pop, which offer engaging and instructional videos on this topic.
6. Teacher-Generated Resources:
   - Create customized resources to suit the specific needs of the struggling learner. Develop worksheets, task cards, or interactive activities that provide focused practice on using units of time. Incorporate visuals and hands-on elements to enhance understanding.
7. One-on-One Instruction:
   - Consider providing one-on-one instruction or small-group sessions to address the learner's specific needs. Use manipulatives, visuals, and real-life examples to help them grasp the concept of time measurement. Offer guided practice and provide immediate feedback to reinforce learning.

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

1. Time Measurement Puzzles and Games:
   - Websites like Math Playground (www.mathplayground.com) and Funbrain (www.funbrain.com) offer challenging time measurement puzzles and games suitable for grade 2 students. These activities often involve solving time-related problems or figuring out the duration of events using different units of time.
2. Time Measurement Word Problems:
   - Create or find grade-appropriate word problems that require the learner to apply their understanding of time measurement. Include scenarios where they need to compare durations, calculate elapsed time, or solve time-related puzzles.
3. Time Measurement Task Cards:

- Task cards provide independent practice opportunities. Create or find task cards that involve higher-order thinking skills related to time measurement. These cards can include activities like ordering events based on duration, solving time word problems, or estimating the time taken to complete different tasks.

4. Time Measurement Projects:
   - Assign a time measurement project where the learner can apply their skills to real-life situations. For example, ask them to create a schedule for a day's activities, including the estimated duration of each event. They can use a mix of standard and non-standard units to describe the time taken for each activity.
5. Enrichment Books and Worksheets:
   - Look for grade-appropriate enrichment resources that provide challenging time measurement activities. Books like "Math Minutes" by Creative Teaching Press or "Challenging Time for Kids" by Brainstorm Education offer engaging exercises to reinforce time measurement skills.
6. Online Math Enrichment Platforms:
   - Websites like IXL (www.ixl.com) or Prodigy (www.prodigygame.com) offer math enrichment programs that include advanced time measurement activities. These platforms provide personalized challenges and adaptive learning experiences.
7. Collaboration and Problem-Solving Activities:
   - Engage the learner in collaborative activities that involve problem-solving and critical thinking skills related to time measurement. For example, present them with a scenario where they need to plan and coordinate a series of events, considering the time taken for each activity and their sequencing.
8. Real-Life Experiences:
   - Encourage the learner to apply their time measurement skills in real-life situations. For instance, challenge them to time themselves while completing tasks or activities and record the duration using various units. This hands-on approach reinforces the application of time measurement skills in practical contexts.

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):

Essential Learning Outcome: Measurement 1.4

Introduction to the Subject:
The measurement strand is mathematically powerful, and it enables the identification and quantification of attributes of objects so that they can be compared and ordered. It plays a crucial role in everyday life and it provides a link among the different strands of mathematics. This grade focuses on linear measurement, mass, capacity, time, and money.
It is important for students to understand linear measurements and their attributes, how to measure them accurately and use the appropriate units and tools of measurement. They will develop the skill to measure objects using units. In this context, students will learn to choose and use non-standard and standard units to measure lengths and also understand the inverse relationship between the size of a unit and the number of units needed to measure a given length. Additionally, students will explore the relationship between centimeters and meters as units of length and use benchmarks to estimate lengths. They will learn to measure, draw and compare lengths in centimeters and meters using measuring tools and recognize the impact of starting points other than zero on the measurement tool.
Further, they will explore the concept of time and learn how it is measured and represented as well as develop the ability to tell time. Moreover, students will understand how to describe the duration of events accurately and make meaningful comparisons. Also, it is very essential that students develop a deep understanding of money and its value. This curriculum will afford students the opportunity to interact with different coins whose sum is less than or equal to one dollar.
Ultimately, Grade two students will gain a deeper understanding of the concept of measurement and how it applies to the world around them by developing these skills.

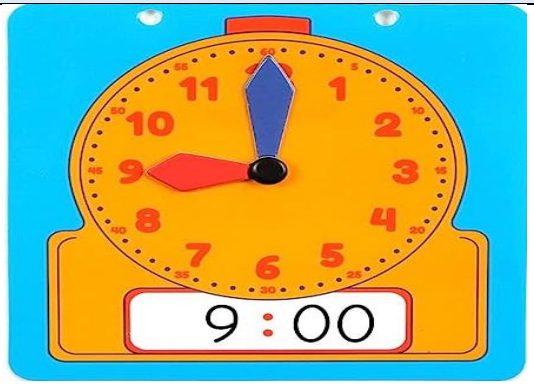
Strand (Topic): MEASUREMENT

Essential Learning Outcome 1.4: Understanding What and How We Measure - Developing and applying standard units of measurement

Grade Level Expectations

Measure the length of an object by selecting and using appropriate tools such as rulers, meter sticks, and measuring tapes. Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m. Develop an understanding of common terms, such as, but not limited to, quarter past, half past. Count a mixed collection of coins whose sum is less than or equal to one dollar. Solve real world and mathematical problems within one dollar involving 25c, 10c, 5c, and pennies, using the ¢ (cent) symbol appropriately.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
1. Use units of time, including seconds, minutes, hours, and non-standard units, to describe the duration of various events. 2. Represent and read time on the hour, half past the hour and quarter past the hour. 3 Tell time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.	**Multi-sensory Approaches**: Incorporate multi-sensory approaches to cater to different learning styles. *For example*, use tactile materials, such as textured clock faces, to help students feel and explore the concept of time.  https://www.glenbryde.com/c2854tch-comitti-of-london-the-windsor-grandfather-clock-oak This is a grandfather clock. On this clock both senses of hearing and sight come into play. **Multiple Representations:** Provide various representations of time, including analog clocks, digital clocks, and written time formats (e.g., 3:45 p.m.). This allows students to choose the format they feel most comfortable with and demonstrates their ability to interpret time across different representations.	SEO 1 Engage students in a variety of events of different duration during class time. Have students do timed activities that are 5 seconds long, ½ minute, 1 to 2 minutes long. For example, let them close their eyes, clap their hands and sing a song for different durations. Point out the duration of short and long events during the school day. Provide students with both analog and digital clocks. Learners need to work with analog clocks to develop basic concepts about reading clocks and telling time. Have students observe clocks set precisely to the hour or half hour and later quarter past the hour. Have students work with a one-handed clock first and use lots of approximate languages, for example, "It's about 7 o'clock." "It's a little past 9 o'clock." "It's halfway between 2 o'clock and 3 o'clock". Engage students in conversation such as, what happens to the big hand as the little hand goes from one hour to the next. If the hour hand is about halfway between numbers, where would the minute hand be? If the hour hand is a little past or before an hour (10 to 15 minutes), where would the minute hand be?

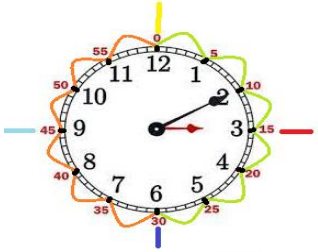
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
3. Add a mixed collection of coins whose sum is less than or equal to one dollar. e.g. 25c, 10c and 5c pieces. 4. Solve real world and mathematical problems within one dollar involving 25c, 10c, 5c, and pennies, using the ¢ (cent) symbol appropriately.	 **Technology-Based Assessments:** Utilize interactive tools or educational apps that allow students to practice counting and adding coins digitally. These resources often provide visual cues and immediate feedback, making the assessment engaging and interactive. Examples of Apps like Prodigy, Mathseeds, and Mathletics **Open-Ended Projects:** Assign open-ended projects where students create their own real-world scenarios involving coins. They can write word problems, create visual representations, and solve the problems themselves. This project-based approach encourages creativity, critical thinking, and application of coin-counting skills. **Real Coins Assessment**: Provide students with a set of real coins, including quarters (25 cents), dimes (10 cents), and nickels (5 cents). Ask them to count the coins and determine if the sum is less than or equal to one dollar. Observe their counting methods, accuracy, and ability to identify coin values.	Provide students with the opportunity to see two clocks, one with only an hour's hand and one with two hands. The two-handed clock can be covered, and students predict where the minute hand should be. Uncover the other clock and discuss. Introduce students to 5-minute intervals on the clock by counting by fives going around the clock. Instead of students saying the minute hand is "pointing at the 4," transition to the language "it is about 20 minutes after the hour." Encourage students to look first at the hour hand to learn approximately what time it is and then focus on the minute hand for precision. Engage students in conversation on the issue of a.m. and p.m. **Simulation activities:** Provide opportunities for students to practice their coin-counting skills in real-life situations, such as at a pretend store or shop in class or during a classroom economy activity. Math Centers: Set up math centers where students can independently explore and practice adding coins. Include activities like sorting and categorizing coins, creating different combinations, and adding them up to find the total value.

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*)

1. Use the common terms in time, such as, but not limited to, quarter past, half past appropriately.

2. Clock showing ½ past. Attention must be placed on the position of both the hour and minute hand. Also, which side is to the hour and past the hour. It is also important to refer to the concept of fractions such as ½ and ¼ and relate them to ½ past the hour and ¼ past and to the hour.

3. Tell time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.



4. Clock showing five-minute intervals and at the same time reviewing and reinforcing ½, and ¼ past and ¼ to the hour.
5. Add a mixed collection of coins whose sum is less than or equal to one dollar. E.g. 25c, 10c and 5c pieces.

Coins summed up to exact $1.00

Coins that sum up to less than $1.00 in different assortment.

0. Solve real world and mathematical problems within one dollar involving 25c, 10c, 5c, and pennies, using the ¢ (cent) symbol appropriately.

https://playtolearnpreschool.us/grocery-store-dramatic-play/

As students enter the grocery shop they will choose a word problem and act it out.

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

Additional Resources and Materials

1. Play coins and real coins
2. Vending machine

https://www.alibaba.com/product-detail/Interactive-Vending-Machine-Toy-Pretend-Play_1600475914954.html

Real clocks and pupils made clocks

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

1. **Language Arts**: Have students write a short story or create a comic strip that incorporates time and money. They can develop a narrative where characters plan and budget for a special event, such as a birthday party or a trip to the zoo. This activity integrates creative writing and storytelling skills with time-telling and money-counting concepts.
2. **Science:** Integrate time and money in a science lesson on daily routines or natural cycles. Students can observe and record the time it takes for different activities to occur, such as the growth of a plant or the rotation of the Earth. They can also explore the cost of materials needed for experiments or projects, fostering an understanding of budgeting and resource management.
3. **Social Studies:** Explore the concept of historical time periods and their associated costs. Students can learn about different time periods, such as the 19th century or ancient civilizations, and discuss the types of currency used and the cost of goods and services during those times. This integration provides insights into historical contexts and develops students' understanding of the relationship between time and money.
4. **Art**: Incorporate time and money concepts into art activities. For example, students can create a collage or drawing that represents their favorite activities or hobbies. They can then estimate and label the time spent on each activity and include elements that represent the associated costs. This integration encourages creativity, time awareness, and an understanding of resource allocation.

5. **Physical Education**: Integrate time and money into physical education activities. Students can participate in a "Fitness Challenge" where they engage in various exercises or activities for a specific duration. They can earn "fitness coins" or points for completing each exercise, and these can be used to "purchase" rewards or privileges. This integration promotes physical activity, time management, and financial awareness.
6. **Music**: Incorporate time and money into music lessons by exploring rhythmic patterns and note values. Students can practice counting beats and durations using musical notes, which involves understanding fractions of time. Additionally, they can create "money songs" where they assign different musical notes or rhythms to specific coin values, reinforcing both concepts simultaneously.
7. **Health and Nutrition**: Integrate time and money into lessons on healthy eating and nutrition. Students can learn to plan and prepare healthy meals on a budget, considering the time required for meal preparation and the cost of ingredients. They can compare prices of different food items and make choices based on nutritional value and affordability.
8. **Technology**: Utilize technology tools and educational apps that combine time and money concepts. Interactive games or simulations can engage students in virtual scenarios where they manage time and finances, such as running a virtual store or planning a schedule with time constraints and budget limitations.

Elements from Local Culture: *(References that learners might know from their local environment*
¼ is referred to 25 cents
Relate half past, quarter to and quarter to the hour to specific time, to school activities of the school day.
E.g. School starts at 9:00 am.
Break time is 15 minutes past 10:00 am etc.

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

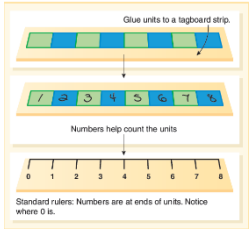
- Hands on activities
- Role play
- Videos

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

- Time and Money Puzzles
- Time and Money Bingo
- Advanced Time and Money Word Problems
- Time and Money Riddles
- Time and Money Estimation
- Time and Money Projects
- Time and Money Research Projects
- Time and Money Challenge Stations

Essential Learning Outcomes: Measurement 2.1 and 2.2

Introduction to the Subject: The measurement strand is mathematically powerful, and it enables the identification and quantification of attributes of objects so that they can be compared and ordered. It plays a crucial role in everyday life and it provides a link among the different strands of mathematics. This grade focuses on linear measurement, mass, capacity, time, and money. It is important for students to understand linear measurements and their attributes, how to measure them accurately and use the appropriate units and tools of measurement. They will develop the skill to measure objects using units. In this context, students will learn to choose and use non-standard and standard units to measure lengths and also understand the inverse relationship between the size of a unit and the number of units needed to measure a given length. Additionally, students will explore the relationship between centimeters and meters as units of length and use benchmarks to estimate lengths. They will learn to measure, draw and compare lengths in centimeters and meters using measuring tools and recognize the impact of starting points other than zero on the measurement tool. Further, they will explore the concept of time and learn how it is measured and represented as well as develop the ability to tell time. Moreover, students will understand how to describe the duration of events accurately and make meaningful comparisons. Also, it is very essential that students develop a deep understanding of money and its value. This curriculum will afford students the opportunity to interact with different coins whose sum is less than or equal to one dollar. Ultimately, Grade two students will gain a deeper understanding of the concept of measurement and how it applies to the world around them by developing these skills.
Strand (Topic): Measurement
Essential Learning Outcomes: 2.1 Applying Techniques, Tools and Formulae for Measuring - Developing personal referents for measuring attributes. **Essential Learning Outcomes 2.2** Applying Techniques, Tools and Formulae for Measuring - Using tools to measure attribute
Grade Level Expectations: Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit. Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units. **Grade Level Expectations:** Estimate lengths using units of centimeters, and meters.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
1. Compare Measurement of lengths using a standard unit. 2. Solve addition and subtraction problems involving lengths up to 100 that are given in the same units. 3. Estimate lengths using centimeters and Meters. 4. Explore and estimate liquid volumes and masses of objects using standard units of grams (g) and milliliters (ml). 5. Measure attributes like length, weight, and time accurately by using units such as inches, centimeters, pounds, kilograms, and minutes. 6. Estimate measurements and make comparisons between different objects or quantities based on their attributes such as longer/shorter, heavier/lighter, and faster/slower. 7. Use measurement tools such as rulers, scales, and timers to measure and compare attributes.	**Problem Solving** Present real-life measurement problems that require students to apply their measurement skills. For example, using a Meter Ruler, asks students to measure the length of their desktop, a bookshelf or the distance between two objects in the classroom**.** **Performance-Based Assessments:** Provide opportunities for students to demonstrate their understanding through hands-on activities and real-life tasks. For example, each of the pencils below has a height of 12cm. What is the total height of all the pencils together?  https://www.vectorstock.com/royalty-free-vector/fun-kids-cartoon-color-pencils-vector-38146396 **Collaborative Assessments:** Encourage collaboration and peer-to-peer learning by incorporating group assessments. This can involve students working together to solve problems or explain concepts to each other. **For example,** students in groups of twos will be given a list of items in their group to estimate the length of each	**Problem Solving** Provide students with task to be completed in groups of twos. For example, students can be asked to solve problems like the one below. *T*he distance between the tuckshop and their classroom is 8 meters. How many pieces of rope 40 centimeters long can they join to meet the distance between their class and the tuckshop? Create learning stations where students can make their own rulers by gluing the units in alternating colours onto the card stock for example:  Retrieved from: *Van de walle et al.(2018)* Have students use their new rulers to measure items on a list that is provided. Discuss the results. There might be discrepancies due to rulers that were not made properly or a failure to understand how a ruler works. **Visual Representation**

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
8. Use simple formulas related to measurement to calculate the perimeter of basic shapes or find the average length of objects.	item using centimeters and meters. They will then record their estimate on a given form and then share with other groups. **Formative Assessments:** Implement ongoing formative assessments throughout the learning process. Use informal observations, questioning techniques, and anecdotal records to gather evidence of student progress and understanding. For instance, students are given a list of items where the mass and capacity of these items will be explored and estimated. The teacher then presents a chart with the mass and capacity of each item. At the end of each week a formative assessment is given, and the students' scores are recorded. **Written Exams:** These assessments typically involve answering questions in a written format, such as multiple-choice, short answer, or essay questions. Written exams are used to assess knowledge, comprehension, and critical thinking skills. For example students are given a list of items on a chart and they are to identify the most appropriate unit of measure that can be used to measure each **Portfolios:** Portfolios are collections of students' work that demonstrate their progress and achievements over time. They can include various artifacts such as essays, projects, artwork, or reflections. For example, ask pupils to create a portfolio showing and comparing items into categories such as longer/shorter, heavier/lighter, faster/slower.	Provide Students with visual aids such as charts, diagrams, and pictures which can help students visualize and understand measurement concepts better. For example when measuring how much liquid a container can hold, they will refer to the chart on capacity which will be helpful in calculating the capacity of the container. Provide students with the opportunity to compare capacity by filling one container with something and then pouring that amount into the comparison container. Have students compare volumes of solids such as a ball and an apple - a displacement method must be used. Have students predict which object has the smaller or greater volume and then place it in a measuring cup or beaker filled with water to see how much the water rises. Provide students with the opportunities to estimate and compare measurements. For example, have students work in small groups and provide beakers marked in milliliters. Give students three ice cubes. First, they must estimate how many milliliters of water will be in the beaker when the ice melts. Then the ice is placed in each team's container, and students wait until the ice warms and turns to water. What was the difference between their estimates and their actual answers? Students can use a bar graph to record and discuss the different measures.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Peer Assessment: Peer assessment involves students evaluating and providing feedback on their peers' work, self-reflection, and the development of critical evaluation skills. For example, students working with peers will be given measurement tools such as rulers, scales and stopwatches. The students will measure the weight and length of given substances. Also, they will measure time taken to complete various activities within the group. Students will also provide feedback to their peers. **Gather Relevant Resources:** Collect all the necessary resources such as textbooks, online courses, videos, practice exercises, and sample assessments. For example, students will be given websites where they can find online practice exercises on finding the perimeter of given shapes. They will also be given practice exercises on finding average length of objects.	**Collaborative Learning Strategy** Pupils working in groups can write the names and mass of snacks in the school's tuckshop. Another group of students can work together and make a list of the different soft drinks and their capacity in the tuckshop. Pupils in groups can share their information with other groups in their classroom. And discuss what was different, similar and what was surprising. **Observation and demonstration** Provide students with opportunities to observe demonstrations of measuring mass using a balance scale. Have students work in small groups to measure different sizes of masses and make comparisons. Research and Questioning Ask students to undertake simple projects like the Metric system of measurement versus Imperial measurement. Ask pupils to compile a booklet with the different units of measure and the type of items that each unit will measure. **Observing, Modelling and Demonstration** Pupils in different groups will find the lengths, mass and capacity of a given list of things. Pupils will observe, model and demonstrate how to find the length using a ruler, they will find the mass of the

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		substance using a scale and the capacity of a container using a measuring cylinder. For example  Retrieved from: https://teachsimple.com/product/measuring-length-worksheet and https://www.youtube.com/watch?v=iFteXKARrAY **Technology Integration**: interactive visualizations, simulations, and immediate feedback. Pupils will be given internet websites where they can find interactive math games to practice there skills in measurement, such as, https://www.ixl.com/math/grade-2/measure-using-a-centimeter-ruler

Useful Content Knowledge for the Teacher about the Outcome:

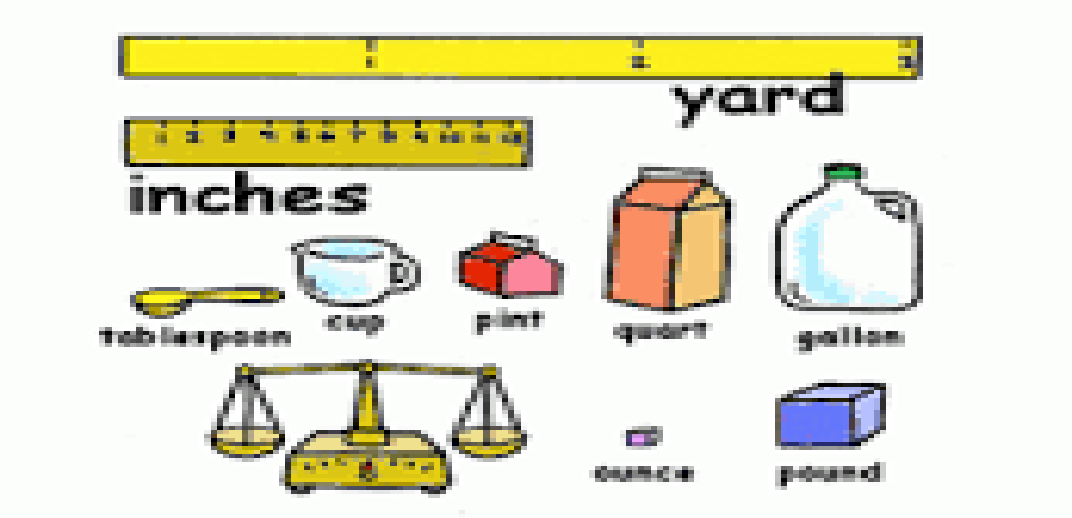
Mass is a measure of how heavy or light things are. We sometimes use the word **"weight** when "we talk about how heavy or light things are. Grams is the metric unit of Mass. Mass is measured using a balance scale or digital scale. We can measure the mass of very light items in Milligrams.(mg). There are **1000 mg** in **1 gram.** A milligram is very light.

Capacity is the amount of liquid a container can hold. The metric unit for measuring capacity is Litres. A measuring cylinder is used to measure the amount of liquid in a container. **1 litre** is equal to **1000 milliliters.**

The metric unit for measuring length is Metres.(m) Your arm span is about the **distance** of 1 meter. There is **100 centimetres in 1 Meter.** Some lengths are shorter than 1 cm. We can measure these in smaller units called **Millimetres** (mm) There are **10 mm in 1 cm.**

A millimetre is about the same thickness as a coin. Length of a new pencil= 12cm . The height of the door = 2 metres .

We use a **clock** to measure time**. Hours, Minutes and seconds** are units of time. Time is also measured in **days, weeks, months and years.**



https://www.youtube.com/watch?v=cOgXQ5d-Myo

Inclusive Resources and Materials from Regional Specialists

Manipulatives: Provide students with hands-on materials such as measuring tapes, rulers, measuring cups, and scales.

Visual aids: Use visual representations such as posters, charts, and diagrams to illustrate measurement concepts.

Online resources: Utilize interactive websites and educational apps that offer measurement activities. Websites like Math Playground and PBS LearningMedia provide free measurement games, videos, and printable worksheets suitable for second-grade students.

Books and literature: Incorporate children's books that discuss measurement concepts in a relatable and inclusive way.

Additional Resources and Materials
Hand span, footprint, Yard stick, The sun, water bottles, Measuring cylinder, Tapeline, Thread, Clock, Ruler, Bathroom Scale, paper clip, hair pin, common pin, match stick, rubber band, tooth pick, Measuring cup

Opportunities for Subject Integration:

1. **Science:** In science classes, measurement plays a crucial role in gathering and analyzing data. Students can apply mathematical concepts of measurement to conduct experiments, record observations, and make accurate measurements of quantities such as length, mass, volume, temperature, and time.

Geography: Geography often involves measuring distances, areas, and angles on maps or globes. Students can learn about scale and use measurement skills to calculate real-world distances based on map scales.
Art: Visual Art Students can learn about geometric concepts such as symmetry, angles, and ratios to create precise drawings or designs.
Language Arts: Students will write stories, poems and paragraphs involving length, mass and capacity.
Physical Education: Measurement concepts like distance, speed, time, and height are frequently used in physical education.

Elements from Local Culture:
The island of Grenada is about 21 miles or 34 kilometers long and 12 miles or 19 kilometers long.
Mt St. Catherine is the highest mountain in Grenada. It is approximately 840 metres high.
16 ounces is equal to one pound.
12 inches is equal to 1 foot.
36 inches is equal to 1 yard.

Resources for a learner who is struggling:

Hands-on Activities:

Classroom Measurement Centers: Set up measurement centers in the classroom where students can engage in hands-on activities. For example, provide rulers, measuring tapes, and scales for students to measure objects and compare their lengths or weights.
Real-Life Measurement Tasks: Encourage students to apply their measurement skills to real-life situations. For example, have them measure the length of classroom objects, estimate the weight of books, or compare the capacities of different containers.
Educational Videos: Make Educational videos on measurement concepts available to students. The videos should cover topics like measuring length, weight, and capacity, and provide clear explanations and examples. (Website: https://www.khanacademy.org/math/cc-second-grade-math)

- **Math Antics:** Math Antics has a measurement video series that covers topics like length, weight, and capacity. The videos are animated and provide step-by-step explanations of measurement concepts. (Website: https://mathantics.com/section/lesson-video/measurement**)**

Provide Printable Worksheets for students. Students can practice measuring objects using rulers, comparing lengths, and estimating lengths. (Website: https://www.education.com/worksheets/second-grade/measurement/)
K5 Learning: K5 Learning provides printable measurement worksheets with a focus on length, weight, and capacity. The worksheets include various activities such as measuring objects with non-standard units, comparing sizes, and solving word problems. (Website: https://www.k5learning.com/free-math-worksheets/second-grade-2/measurement)

Interactive Websites

Fun Brain: This website offers various interactive games and activities related to measurement.

Math Playground: Math Playground provides a collection of measurement games, including measuring lengths with rulers and estimating lengths.

Resources for a learner who needs challenge:

Online Games and Activities:

ABCya! (www.abcya.com): This website offers a variety of interactive measurement games for grade 2 learners.

Funbrain Jr. (www.funbrainjr.com): It provides measurement-related games and activities suitable for grade 2.

Printable Worksheets:

.**Education.com (www.education.com):** This website offers a range of measurement worksheets for grade 2 learners. You can find worksheets on topics such as measuring length, weight, and capacity.

.**Super Teacher Worksheets (www.superteacherworksheets.com):** They provide printable measurement worksheets specifically designed for grade 2 students.

Books:

"How Tall, How Short, How Far Away?" by David A. Adler: This book explores the concept of measurement in a fun and engaging way for young learners.

"Me and the Measure of Things" by Joan Sweeney: It introduces measurement through relatable scenarios and colorful illustrations.

Manipulatives:

- **Measuring Tape:** Providing a measuring tape can allow students to practice measuring objects around them, such as the length of their desks, the height of a door, or the circumference of different objects.

Essential Learning Outcome: Measurement 2.3

Introduction to the Subject:
The measurement strand is mathematically powerful, and it enables the identification and quantification of attributes of objects so that they can be compared and ordered. It plays a crucial role in everyday life and it provides a link among the different strands of mathematics. This grade focuses on linear measurement, mass, capacity, time, and money.
It is important for students to understand linear measurements and their attributes, how to measure them accurately and use the appropriate units and tools of measurement. They will develop the skill to measure objects using units. In this context, students will learn to choose and use non-standard and standard units to measure lengths and also understand the inverse relationship between the size of a unit and the number of units needed to measure a given length. Additionally, students will explore the relationship between centimeters and meters as units of length and use benchmarks to estimate lengths. They will learn to measure, draw and compare lengths in centimeters and meters using measuring tools and recognize the impact of starting points other than zero on the measurement tool.
Further, they will explore the concept of time and learn how it is measured and represented as well as develop the ability to tell time. Moreover, students will understand how to describe the duration of events accurately and make meaningful comparisons. Also, it is very essential that students develop a deep understanding of money and its value. This curriculum will afford students the opportunity to interact with different coins whose sum is less than or equal to one dollar.
Ultimately, Grade two students will gain a deeper understanding of the concept of measurement and how it applies to the world around them by developing these skills.

Strand (Topic): MEASUREMENT

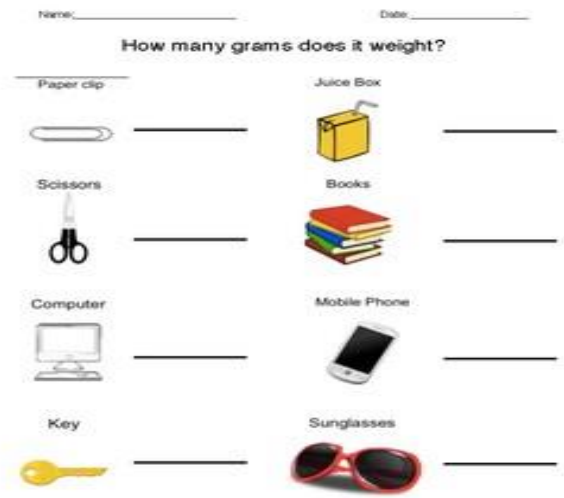
Essential Learning Outcomes: Measurement 2.3: Applying Techniques, Tools and Formulae for Measuring - Developing and applying formulae for measuring

Grade Level Expectations: Explore and estimate liquid volumes and masses of objects using standard units of grams (g) and milliliters (mL).

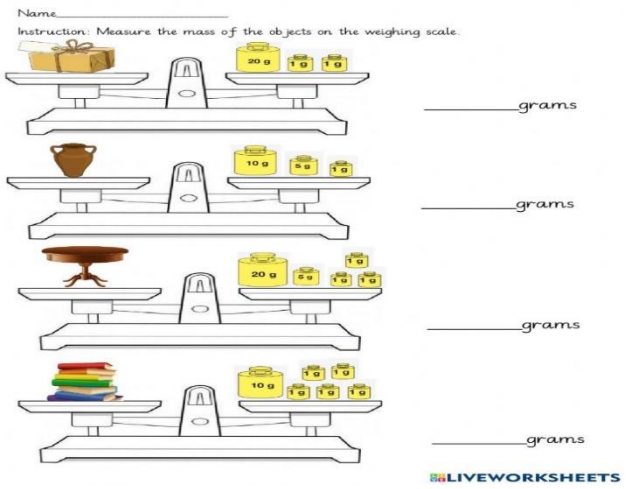
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
• Identify the standard units of grams (g) for mass and milliliters (mL) for volume. • Estimate the volume of liquid in containers using milliliters (mL) as the unit of measurement. • Estimate the mass of objects using grams (g) as the unit of measurement. • Compare and order different volumes of liquids and masses of objects using concepts such as more than, less than, and equal to when comparing volumes and masses. • Use measuring tools, such as graduated cylinders or measuring cups, to measure the volume of liquids accurately in milliliters (mL). • Use a balance or scale to measure the mass of objects accurately in grams (g). • Record measurements of volumes and masses in	SCO1 Checklist **Estimation Skills:** Estimating Volume: The student: - can estimate the volume of liquid in containers using milliliters (mL) as the unit of measurement. - provides reasonable estimations based on the size and shape of the container. - demonstrates consistent and accurate estimations. Understanding of Milliliters: Unit of Measurement: The student: - understands that milliliters (mL) are used to measure the volume of liquids. - recognizes that milliliters are smaller units compared to liters. Comparing Volumes: The student: - can compare the volumes of different containers and identify which contains more or less liquid. - understands that a higher number of milliliters represents a larger volume.	SCO1 Hands-on Exploration: Provide students with a variety of containers of different shapes and sizes, along with measuring cups or syringes marked in milliliters. Allow students to pour water into the containers and estimate the volume in milliliters. Encourage them to discuss their estimations with their peers and compare their results. SCO2 Estimation Games: Create estimation games where students are presented with different objects and asked to estimate their masses in grams. Provide prompts such as "Which object do you think weighs around 50 grams?" or "Estimate the mass of this object to the nearest 10 grams." Encourage students to explain the reasoning behind their estimations. SCO3 Group Discussions and Peer Collaboration: Divide students into small groups and provide them with different objects or containers. Ask them to compare and order the volumes or masses within their groups. Encourage them to discuss their reasoning and reach a consensus. Have groups present their findings to the whole class, fostering collaboration and peer learning. SCO4 Explicit instruction and Demonstration: Begin by introducing the measuring tools, such as graduated cylinders or measuring cups, to the students. Explain their purpose and how they are used to measure the volume of

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
appropriate units (grams or milliliters) and write them in numerical form. • Solve problems involving estimating and measuring volumes and masses using grams and milliliters. • Create real-life situations, such as measuring ingredients for a recipe or estimating the amount of liquid in a container.	Example of checklist: retrieved from: https://www.twinkl.com.au/resource/australian-curriculum-f-2-measurement-rubric-checklist-au-n-2548647  Engage students in conversations. Real-Life Application: The student can apply the concept of milliliters to real-life situations, such as estimating the volume of liquids in everyday objects. Example of Rubric for real-life Application Assessment Levels: Advanced: The student consistently demonstrates accurate estimations and a deep understanding of milliliters. Proficient: The student provides reasonable estimations and shows a good understanding of milliliters.	liquids in milliliters (mL). Demonstrate how to read the measurements on the tools and emphasize the importance of accuracy.  https://www.google.com/imgres?imgurl=https%3A%2F%2Fchem.libretexts.org%2F%40api%2Fdeki%2Ffiles%2F55465%2F420d533f15e030cc280f0514f8b8addc.jpg%3Frevision%3D1&tbnid=3jfrHny4WcERUM&vet=12ahUKEwjp-_KLp87_AhX2qIQIHVyrCkQQMygpegUIARDyAQ..i&imgrefurl=https%3A%2F%2Fchem.libretexts.org SCO5,6,7 Hands-on Practice: Provide each student or pair of students with a balance or scale and a variety of objects of different masses. Instruct students to carefully place objects on the balance or scale and observe the

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Developing: The student occasionally provides estimations that need refinement but shows some understanding of milliliters. Beginning: The student struggles to estimate volumes accurately and has limited understanding of milliliters. SCO2 Estimation Tasks: Provide students with a set of objects of different masses. Ask them to estimate the mass of each object and record their estimations on a worksheet. Include a range of objects that vary in mass, from lighter objects like pencils to heavier objects like books or classroom supplies. Evaluate their estimations for reasonableness and accuracy. • Pencil: A pencil is generally lightweight. It would have a mass of around 10 to 20 grams. • Book: A small paperback book might have a mass of approximately 100 to 200 grams, while a larger hardcover book could weigh between 500 grams to 1 kilogram. • Apple: The mass of an apple can vary depending on its size. On average, an apple weighs around 100 to 200 grams. • Water bottle: A typical water bottle, when full, may have a mass of approximately 500 grams to 1 kilogram. However, this can vary depending on the size and material of the bottle. • Toy car: The mass of a small toy car can range from 50 to 100 grams. Larger toy cars may weigh more, up to a few hundred grams.	measurement in grams. Encourage them to compare the masses of different objects. SCO8 Guided discovery: Begin by explaining the importance of measurement in everyday life and how it helps us in various situations. Discuss common scenarios where measurement is required, such as cooking, baking, or filling containers. Emphasize the relevance of accurate measurement in achieving desired outcomes.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 https://www.google.com/search?q=objects%20measured%20in%20grams&tbm=isch&rlz=1C1GCEA_enGD936GD936&hl=en-GB&sa=X&ved=0CCQQtI8BKANqFwoTCIiE8qHqjIADFQAAAAAdAAAAABA5&biw=1349&bih=625#imgrc=sxYOTHTemKhQLM SCO3 Sorting Tasks: Provide students with a set of objects or containers of varying volumes or masses. Ask them to sort and categorize the objects based on their comparisons. Look for their ability to identify which objects have more, less, or an equal volume or mass.	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Assess their understanding through their sorting and categorization choices. SCO4 Performance Tasks: Design performance tasks where students are given specific volumes to measure using the measuring tools. Provide a set of containers and liquids of various volumes and ask students to measure and match the correct volume to each container. Assess their accuracy and understanding of measuring in milliliters. SCO5,6,7	

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	Worksheets or Practice Exercises: Provide worksheets or practice exercises that require students to measure the mass of objects using the balance or scale. Include a range of objects and ask students to record their measurements in grams. Assess their ability to read the measurements accurately and convert them into grams.  https://www.liveworksheets.com/nv1697136dc SCO8 Performance Tasks: Design performance tasks where students are given specific recipes or containers to work with. Ask them to measure ingredients, follow the steps of the recipe, and record their measurements. Assess their ability to use the correct tools, follow instructions, and achieve the desired outcome.	

Useful Content Knowledge for the Teacher about the Outcome:

- Units of Measurement:
  - Liquid volumes and masses: grams (g) for mass and milliliters(mL) for liquid volume. Understand the relationship between these units and how they are used to measure different quantities.
- Measuring Liquid Volume:
  - Liquid volume refers to the amount of space occupied by a liquid and is measured in milliliters (mL).
  - Introduce the concept of measuring liquid volume using tools such as measuring cups, beakers, or graduated cylinders.
  - Read the markings on these measuring tools accurately and estimate volumes between the markings.
- Measuring Mass:
  - Define mass as the amount of matter in an object, measured in grams (g).
  - Mass is typically measured using a balance scale or a digital scale.
  - Help students understand the concept of comparing the mass of different objects by using the appropriate units and tools.
- Estimating Liquid Volumes:
  - Estimate the volume of liquids using visual cues, such as the level of liquid in a container or the height of the liquid in a graduated cylinder.
  - Estimate the volume of various liquids, both in containers and in everyday contexts.
- Estimating Masses:
  - Estimate the mass of objects by comparing them to known masses or using their prior knowledge of similar objects.
  - Develop a sense of weight and make reasonable estimates based on their experiences.
- Comparing and Ordering Volumes and Masses:
  - Compare and order volumes and masses using the appropriate units (grams and milliliters).
  - Compare the volumes of different containers or liquids and the masses of various objects.
- Real-Life Applications:
  - Connect the concept of measuring volumes and masses to real-life contexts, such as cooking, grocery shopping, or measuring liquids for science experiments.
  - Help students understand the importance of accurate measurements in practical situations.
- Hands-on Experiences:
  - Incorporate hands-on activities and experiments that involve measuring volumes and masses using standard units.
  - Manipulate measuring tools, pour liquids, and use scales to enhance their understanding.
- Vocabulary and Language:
  - Introduce and reinforce vocabulary words related to measuring volumes and masses, such as milliliter, gram, estimate, compare, and order.

- Use the appropriate language and terminology when discussing and describing their measurements.

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

7. Caribbean Food and Beverages:
    a. Introduce students to popular Caribbean foods and beverages that involve measuring liquid volumes and masses. For example, discuss the ingredients and measurements used in recipes for dishes like rice and peas, fruit punches, or coconut water. Highlight traditional Caribbean drinks and juices, like sorrel or passion fruit juice. Discuss the quantities in which they are typically served or prepared, emphasizing the use of milliliters to measure liquid volumes.
8. Traditional Caribbean Fruits and Vegetables:
    a. Explore the variety of fruits and vegetables found in the Caribbean region, such as mangoes, bananas, pineapples, and ackee. Discuss their sizes, weights, and the concept of estimating masses using grams.
9. Local Markets and Street Vendors:
    a. Introduce the concept of local markets and street vendors in the Caribbean, where fresh fruits, vegetables, and other food items are sold. Discuss how sellers often weigh their products using scales and measure liquids using containers or bottles.
10. Traditional Cooking Methods and Utensils:
    a. Talk about traditional Caribbean cooking methods and utensils, such as calabash bowls or clay pots, that are used for preparing meals. Connect the use of these utensils to the concepts of volume and mass measurement.
11. Local Crafts and Artifacts:
    a. Discuss traditional crafts and artifacts from the Caribbean, such as woven baskets or pottery. Highlight how artisans use their skills to estimate quantities of materials, such as clay or fibers, for creating these items.

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

7. Interactive Online Games and Activities:
    - Websites like Math Playground (www.mathplayground.com) and SplashLearn (www.splashlearn.com) offer interactive games and activities focused on measuring liquid volumes and masses for grade 2 students. These games provide engaging practice in a fun and interactive format.
8. Printable Worksheets and Practice Sheets:
    - Education.com and Super Teacher Worksheets (www.superteacherworksheets.com) offer printable worksheets specifically designed for grade 2 students to practice exploring and estimating liquid volumes and masses. These worksheets include activities that involve measuring and estimating volumes and masses using grams and milliliters.
9. Visual Aids and Manipulatives:
    - Use visual aids and manipulatives to help the learner understand the concept of liquid volumes and masses. Use measuring cups, graduated cylinders, and balance scales to provide hands-on experiences and make the concepts more tangible.

10. Real-Life Experiences:
    - Provide opportunities for the learner to apply their knowledge of liquid volumes and masses in real-life contexts. Engage them in cooking activities where they can measure ingredients using grams and milliliters or involve them in science experiments that require measuring liquids.
11. Math Manipulative Tools:
    - Utilize math manipulative tools such as base-10 blocks or counting cubes to help the learner visualize and understand the concept of grams and milliliters. They can use these tools to explore and compare different quantities.
12. Peer or Small Group Activities:
    - Encourage peer collaboration or small-group activities where learners can work together to explore and estimate liquid volumes and masses. This allows for peer support and shared learning experiences.
13. Educational Apps:
    - Explore educational apps that focus on measurement and estimation skills. Apps like "Measurement for Kids" (available on iOS) or "Prodigy" (available on iOS, Android, and web) offer interactive lessons and practice activities aligned with grade 2 curriculum standards.

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

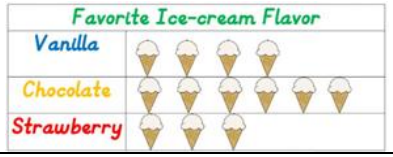
9. Problem-Solving Worksheets:
    - Create or find problem-solving worksheets that involve more complex scenarios related to liquid volumes and masses. Include multiple steps and require critical thinking skills to estimate or compare quantities accurately.
10. Measurement Projects:
    - Assign measurement projects that require the learner to explore and estimate liquid volumes and masses in real-life contexts. For example, ask them to design a recipe using specific measurements or create a presentation on the mass and volume of different fruits or liquids.
11. STEM Challenges:
    - Introduce STEM challenges that incorporate exploring and estimating liquid volumes and masses. For instance, challenge the learner to design a container that can hold a specific volume of liquid or build a structure using objects with different masses.
12. Measurement Games and Apps:
    - Use more advanced measurement games and apps that provide challenging activities. Websites like Math Games (www.mathgames.com) or educational apps like "Measurement Mania" (available on iOS) offer higher-level measurement tasks for grade 2 learners.
13. Math Enrichment Books:
    - Look for math enrichment books specifically focused on measurement concepts. Books like "Measuring Penny" by Loreen Leedy or "How Big Is a Foot?" by Rolf Myller offer engaging stories and activities that challenge learners to think critically about measurement.
14. Differentiated Instruction:
    - Differentiate instruction by providing extension activities for learners who need a challenge. Offer additional problem-solving tasks, open-ended questions, or hands-on experiments that require applying measurement skills in unique ways.
15. Real-Life Challenges:

- Pose real-life challenges to the learner that require them to apply their measurement skills. For example, challenge them to estimate the amount of liquid needed to fill a specific container or to determine the mass of objects using a balance scale.

Vocabulary:
Length, Height, Width, Weight, Capacity, Temperature, Time, Ruler, Scale, Thermometer, Clock, Non-standard Units, Standard Units, Comparing, Estimating, Measuring Tools, Telling Time, Conversion, Adding Measurements, Subtracting Measurements.

Essential Learning Outcome: Data Handling 1.1

Introduction to the Subject: Data is gathered information - especially facts or numbers- that can be used to find out things or to make decisions when examined. Data handling is the process of gathering, recording, and presenting the data or information in a way that is meaningful to others. Good questions are an integral part of data collection. As well, data collection provides a way to connect mathematics to other subject areas. The data collected can then be analysed to make data-driven decisions in the real world. Probability is an essential tool in applied mathematics and mathematical modelling. It is also an essential tool in statistics. A probability describes mathematically how likely it is that something will happen.
Strand (Topic): Data Handling and Probability
Essential Learning Outcomes: ***DH 1.1:*** Learners will develop statistical literacy by recognizing topics for investigation and formulating simple questions that can be answered with data.
Grade Level Expectations: Recognizing topics for investigation and formulating questions with no more than **four** option choices

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Learners will be expected to: **Knowledge** ● Identify simple topics of collective interest for investigation. ● Match investigative topics to relevant questions. **Skills** ● Formulate questions that can be answered by gathering information about self, others, and their environment.	**Gathering information through Observation and Products** **Entrance Slip** Topic: Favourite snack Instructions: Which option below is your favourite snack? Circle your answer. Pizza  Burger  Fries  KFC  *Retrieved from https://images.google.com/*	Model questions for investigation and probe students to formulate good survey questions based on the information that they want to find. E.g. You want to open an ice cream shop near the school. How can you find out which ice-cream flavours are the most popular? Which ice-cream flavour is your favourite? 

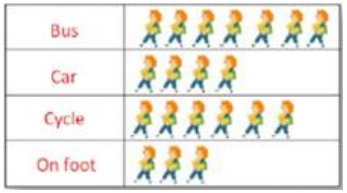
Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Values ● Appreciate the need for the use of appropriate questions in data collection.	**Product- Group Work** Have learners sit in groups of three and formulate a question for investigation. Teacher gives each group a key word which will be the topic of their investigation- e.g., colour, pet, subject, sport etc. Pet- Do you have a pet? or Which one of these is your favourite pet? **Think Pair Share** Let learners sit in pairs and decide on a topic of interest for investigation. Allow students to vary topics to include the classroom, the outdoors, their home etc. Each pair will come up with an investigative question based on the topic and then share it with the class to obtain a response. **Product Exit Slip** Choose a topic from the list below and write a survey question on that topic. Ensure that your classmates are able to respond to your questions. ***musical instrument, shoe size, sport, fruit, siblings***	*Retrieved from https://images.google.com/* Listen to learners brainstorm investigative questions and give guidance on how best to structure questions to collect, organize and analyze data.  Retrieved from https://images.google.com/ Place investigation topics in a bowl and have the learners dip for a topic to investigate as a group. Place good and poor investigative questions on the board and ask learners to distinguish between them.

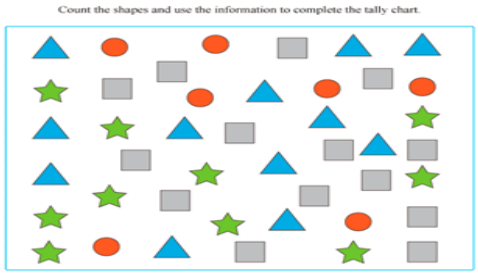
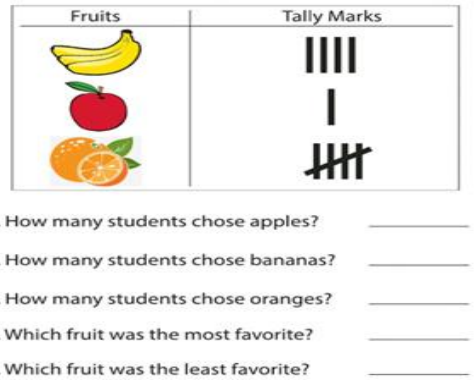
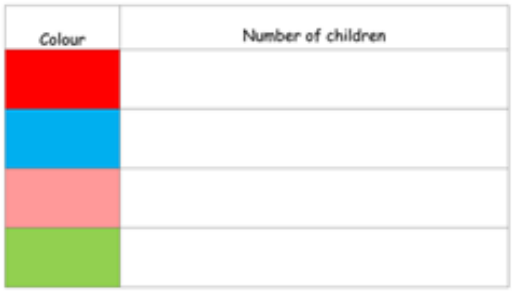
Useful Content Knowledge for the Teacher About the Outcome:
Data is a collection of information gathered through observations, measurements, research, or analysis. They may consist of facts, numbers, names, figures, or even descriptions of things. Data is organized in the form of graphs, charts, or tables.

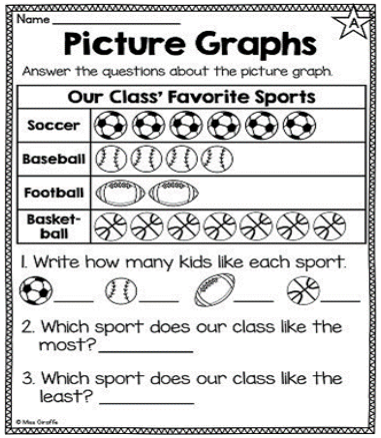
Questions should be designed in a way that can be easily understood and relate to the interests and experiences of Grade 2 students. Providing a few options (not exceeding four) allows for straightforward data collection and analysis.

Essential Learning Outcome: Data Handling 1.2

Introduction to the Subject: Data is gathered information - especially facts or numbers- that can be used to find out things or to make decisions when examined. Data handling is the process of gathering, recording, and presenting the data or information in a way that is meaningful to others. Good questions are an integral part of data collection. As well, data collection provides a way to connect mathematics to other subject areas. The data collected can then be analysed to make data-driven decisions in the real world. Probability is an essential tool in applied mathematics and mathematical modelling. It is also an essential tool in statistics. A probability describes mathematically how likely it is that something will happen.
Strand (Topic): Data Handling and Probability
Essential Learning Outcomes DH 1.2: Collecting, Organising and Displaying Data - Collecting, organising, displaying and communicating data.
Grade Level Expectations: Collecting, organising data with no more than two attributes. Recording and displaying data in tables as tallies and pictographs.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Learners will be able to: **Knowledge** ● List questions of interest for investigation. **Skills** ● Gather and record simple sets of data about self and others through observation and simple interviews.	**Gathering information through Teacher Conversation, Observation and Products** **Observation** Observe learners as they conduct investigations and record the data as a tally or as drawings/pictographs. For example, students can record the types of vehicles which drove past their school over a 15 minute period. **Group Work**	 *Retrieved from https://images.google.com/* Allow learners to conduct simple investigations on a class or small group level and represent the data as pictographs and as tallies.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
• Record data as a tally or as drawings (pictographs). • Use collected data to answer questions. **Values** • Make the connection that data collection is acquiring information to answer important questions.	Give learners a worksheet and have them work in small groups to display items in a tally chart.  Retrieved from https://images.google.com/ **Product- Exit Slip**	Give learners worksheets showing tally charts or pictographs. Have learners describe, orally or in writing, what the graph is showing (interpret the data).  Retrieved from https://images.google.com/  Retrieved from https://images.google.com/

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
	 Retrieved from https://images.google.com/	**Favourite Colour Tally:** Provide each student with a chart or grid labelled with different colours (e.g., red, blue, green, and yellow). Ask the students to walk around the classroom and ask their classmates about their favourite colour. Instruct them to make a tally mark in the corresponding column for each classmate's response. After collecting data, have the students count the tally marks and discuss which colour was the most and least popular. **Favourite Weather Pictograph**: Provide each student with a sheet of paper and ask them to draw three circles to represent three types of weather conditions (sunny, rainy, and cloudy). Instruct the students to ask their classmates about their favourite kind of weather and fill in the circles accordingly. For example, if five classmates prefer sunny days, they can draw five small suns in the sunny circle. Once all the data is collected, discuss the pictograph as a class, noting which weather condition that received the most votes and which received the fewest.

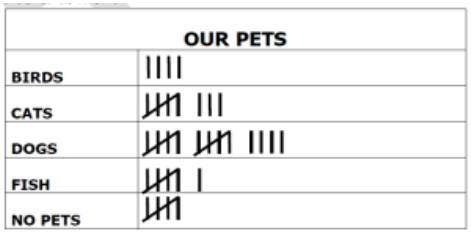
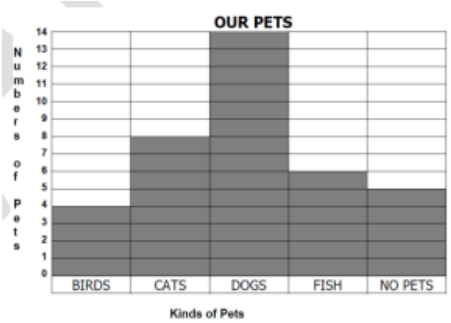
Useful Content Knowledge for the Teacher About the Outcome:

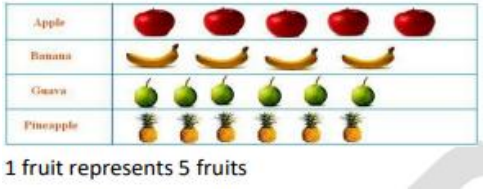
Surveys should be made manageable by obtaining information from a small population (e.g., no larger than a single class) and by limiting the number of categories to three or four.

Essential Learning Outcome: Data Handling 2.1

Introduction to the Subject: Data is gathered information - especially facts or numbers- that can be used to find out things or to make decisions when examined. Data handling is the process of gathering, recording, and presenting the data or information in a way that is meaningful to others. Good questions are an integral part of data collection. As well, data collection provides a way to connect mathematics to other subject areas. The data collected can then be analysed to make data-driven decisions in the real world. Probability is an essential tool in applied mathematics and mathematical modelling. It is also an essential tool in statistics. A probability describes mathematically how likely it is that something will happen.
Strand (Topic): Data Handling and Probability
Essential Learning Outcomes DH 2.1: Using Statistical Methods to Analyze Data - Describing data sets
Grade Level Expectations: Identify the most frequent count, if any, for various data sets presented in concrete graphs, pictographs, bar graphs, and tables, and explain what this measure indicates about the data.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Learners will be able to: **Knowledge:** 1. Identify the most frequent count presented in any data sets (e.g., concrete graphs, pictographs, bar graphs, and tables).	**Gathering information through Teacher Conversation, Observation and Products** **Factor Entrance-Slip** Discuss with students that a class decision is needed for an upcoming class event/trip etc. Given four options, students will decide by show of hands or by voting.	Allow students to discuss the data presented . Help them understand that the mode is the variable with the most frequent count. From the data presented below, students identify the variable that has the most counts. Say what this says about the data. E.g. In picture 1 the mode is dogs since it has the most counts – 14

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
2. Explain in their own words what the most frequent count indicates about the data. **Skills** • Collect, group and analyze data. **Values** • Analyze data and make informed decisions using these data. • Use data to make informed decisions about real life situations. • Appreciate the importance of identifying the most frequent count of any given data.	**Observation** Using data collected from the previous session, observe as students identify the mode in each set of data. Identify the variable with the most counts in the tally chart and the bar graph shown below. . Tally chart Favorite Pets Pet | Tally Marks | Number 10 4 6 Bar graph  Retrieved from Retrieved from https://images.google.com/	*Picture 1*  *Picture 2*  Retrieved from https://images.google.com/ Identify the number for each set of variables: Birds- Cats- dogs- fish- no pets- B. Which one has the most counts?

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
		Guide students to understand that some sets may have two or more modes. This happens when two or more variables have the same number of counts that are more than all the others in the set. Look at the data collected in Picture 3- discuss it, and help students identify the mode.  1 fruit represents 5 fruits Retrieved from https://images.google.com/

Useful Content Knowledge for the Teacher About the Outcome:

- The mode is the variable with the most counts in a set of data.
- The mode of the bar graph would, therefore, be the item that has the highest bar.
- In a set of data there may be more than one mode. This happens when two or more variables have the highest number of counts at the same value.

Inclusive Resources and Materials from Regional Specialists -

Additional Resources and Materials

How to Find the Mode of a Bargraph-https://www.k5learning.com/blog/mode-bar-graph

Worksheet on Pictoral Representation- https://www.math-only-math.com/worksheet-on-pictorial-representation.html

Sample Lesson- https://arkovalprimary.org/sites/default/files/YR3%20-%20Home%20learning%20pack%203%20.pdf

Opportunities for Subject Integration:

Science- Students can identify the mode in given habitats.

Social Studies- Using data on types of families in the class with the most frequent count- single, nuclear, extended.

HFLE- food groups and balanced diets, grocery shopping.

Elements from Local Culture: Data from community- favourite sport, genre of music boys/girls in various classes, frequently visited sites, favourite shows/festivals, favourite bread or other food.

Resources for a learner who is struggling:

Sort and Count Worksheet-https://www.k5learning.com/worksheets/math/data-graphing/grade-1-sort-count-a.pdf

Pictographs Intro-https://youtu.be/koVXynDUee0

Video on Data Representation- https://www.k5learning.com/worksheets/math/data-graphing/grade-1-sort-count-a.pdf

Resources for a learner who needs challenge:

Scaled Pictorgraph-https://www.k5learning.com/worksheets/math/data-graphing/grade-3-scaled-pictographs-a.pdf

Essential Learning Outcome: Data Handling 2.2

Introduction to the Subject:

Data is gathered information - especially facts or numbers- that can be used to find out things or to make decisions when examined. Data handling is the process of gathering, recording, and presenting the data or information in a way that is meaningful to others. Good questions are an integral part of data collection. As well, data collection provides a way to connect mathematics to other subject areas. The data collected can then be analysed to make data-driven decisions in the real world. Probability is an essential tool in applied mathematics and mathematical modelling. It is also an essential tool in statistics. A probability describes mathematically how likely it is that something will happen.

Strand (Topic): Data Handling and Probability

Essential Learning Outcomes: Essential Learning Outcome 2.2 : Using Statistical Methods to Analyse Data - Developing and applying methods to analyse data sets.

Grade Level Expectations:

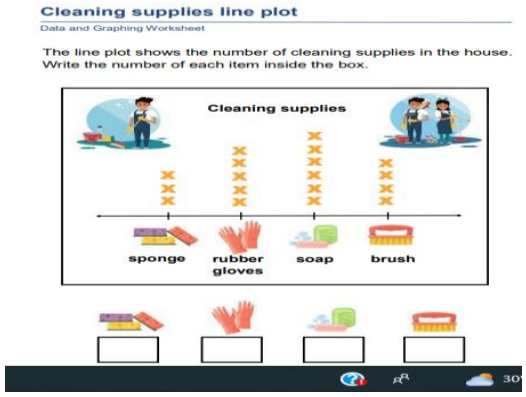
Analyze different sets of data presented in various ways, including in logic diagrams, line plots, and bar graphs, by asking and answering questions about the data and drawing conclusions, then make convincing arguments and informed decisions.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
(Note not all 3 below need to be explicitly identified for each SCO but the presence of all three should be apparent 1. Ask questions to collect data. 2. Collect simple sets of data through observation and simple interview. 3. Use number statements to record the collected data. 4. Collect data using a variety of observation tools. 5. Organize, display and communicate data that has been collected. 6. Record data information on, bar graph, pictograph and tally chart. 7. Create different types of data presentations, including pictograph, and bar graphs to represent data. 8. Identify the most frequent count, if any, for various data sets presented in concrete graphs, pictographs, bar graphs, and	Rubric Paper and Pencil Observational Checklist Projects Virtual assessments	**Observation Field Trips, discussions and questioning** **Information and communication technologies (ICT**): Utilize technology tools such as interactive graphing apps or online data collection tools to make the learning experience more engaging. These tools can provide visual representations and allow students to manipulate and analyze data in a more interactive way. **Collaborative Learning:** Encourage collaborative learning by allowing students to work in pairs or small groups. This fosters teamwork and helps students learn from one another. They can work together to collect data, create graphs, and discuss their findings. **Gamification:** Introduce data handling through fun games and activities. For example, you can create a "Guess the Data" game where students try to guess the data behind a graph or chart based on given clues. This makes learning interactive and enjoyable.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
tables. Identify the key elements of pictograph and bar graph. 9. Analyze data presented in various ways by asking and answering questions about the data. 10. Draw conclusions from the data by making observations and inferences.		

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*)

A **line plot** is a way to display data along a number line. Line plots are also called dot plots.

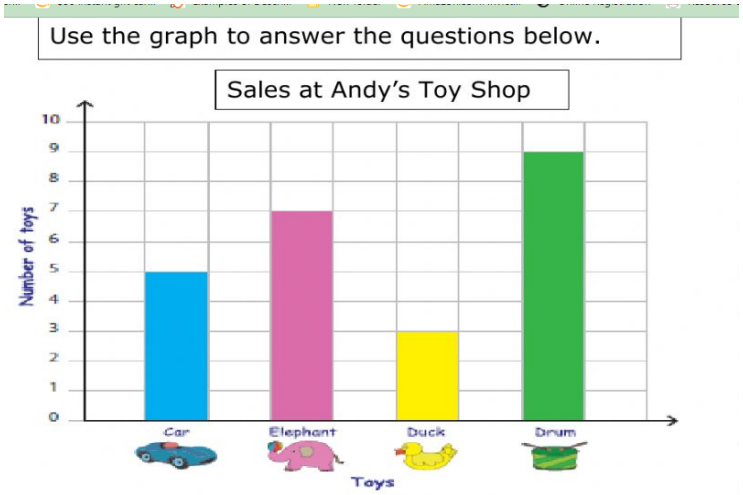


https://www.k5learning.com/worksheets/math/data-graphing/grade-2-line-plots-a.pdf

Steps to introduce line plots to second-grade students:

1. Start with a simple data set:
2. Introduce the number line: Begin by introducing the concept of a number line. Explain that a number line is a line with numbers placed at equal intervals.
3. Plot the data: Show the students how to create a line plot using the collected data. Start by drawing a horizontal line representing the number line. Then, place an X or a dot above the corresponding number for each data point.
4. Count the data points: Help the students count the number of dots or X's above each number on the number line. Emphasize that each dot represents one data point. Write the count next to each number on the line plot.
5. Interpret the line plot: Once the line plot is complete, discuss the data with the students. Ask questions such as "Which number has the most dots?" or "Which number has the fewest dots?" Encourage students to make observations and draw conclusions based on the line plot.
6. Practice reading line plots: Provide additional line plots for students to read and interpret. Use simple data sets and ask questions about the data displayed in the line plot.
7. Extend the learning: To further reinforce the concept, you can introduce additional elements, such as a key or a scale on the line plot. You can also introduce more complex line plots with larger data sets as students progress.

Bar graphs, also known as bar charts, are a common way to visually represent data using rectangular bars of different heights.



https://www.liveworksheets.com/xv487567rq

1. Start with simple data: Gather a set of data that is easy for second-grade students to understand.
2. Introduce the axes: Draw a vertical line on the board to represent the y-axis (or the vertical axis) and a horizontal line to represent the x-axis (or the horizontal axis). Label the y-axis with the categories of the data (in this case, the different colors), and label the x-axis with a scale for counting the number of occurrences of each category.
3. Draw the bars: Draw rectangular bars above each category on the y-axis. The height of each bar represents the frequency or count of that category. For example, if five students chose blue as their favorite color, draw a bar above the "blue" category that reaches the corresponding value on the x-axis.
4. Label the bars: Write the count or frequency of each category at the top of its respective bar. This helps students understand the value each bar represents.
5. Interpret the bar graph: Once the bar graph is complete, discuss the data with the students. Ask questions such as "Which color has the tallest bar?" or "Which color has the shortest bar?"
6. Practice reading bar graphs: Provide additional bar graphs for students to read and interpret. Use simple data sets and ask questions about the data displayed in the graph.
7. Extend the learning: To further reinforce the concept, you can introduce additional elements, such as a key or a legend, to explain the different categories represented in the bar graph. You can also introduce bar graphs with multiple sets of data or stacked bars as students progress.

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

Additional Resources and Materials

Interactive Websites:

Utilize interactive websites that offer age-appropriate data analysis activities and games designed for grade 2 students. These websites can provide engaging visuals, interactive tools, and opportunities for practice and exploration.

https://www.mathplayground.com/video_bar_graphs.html

https://nces.ed.gov/nceskids/createagraph/default.aspx

Picture Books:

Introduce picture books that incorporate data analysis and decision-making themes. Literature used should use present data in a child-friendly manner, providing opportunities for students to engage with visual representations and draw conclusions based on the information presented.

Visual Aids:

Provide visual aids such as posters, charts, or manipulatives that represent data in different formats. These aids can serve as references during lessons and provide visual support for students' understanding of data representation.

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

***S*ocial Studies:**

Logic diagrams can show different fruits, animals, and local artists, which highlights elements of culture.

Conclusion: By exploring the social and cultural contexts of the data, students can develop their understanding of diverse communities and broaden their global awareness.

Science:

Students can construct bar graphs representing different types of animals, investigating their habitats and adaptations of these animals.

Conclusion: By linking the data to scientific concepts, students can deepen their knowledge of the natural world and its interconnections.

Language Arts:

Students can use descriptive language to discuss the data presented in a bar graph, logic diagrams.

Conclusion: By incorporating language arts skills, such as using adjectives and comparative language, students can effectively communicate their observations and conclusions.

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

1. Traditional Games and Sports:
    - Students collect data on traditional Caribbean games and sports, such as marbles, cricket, or dominoes.
      For example: Bar graph representing favourite sports of students in the class.
      Line plot representing the colour of marbles of Max's marbles collection.

2. Cultural Festivals and Religious Celebrations:
    - Students collect data on Caribbean cultural festivals and celebrations, like Carnival or Christmas.
      For example: Grade 2 favourite religious celebration.
      Different types of mas portray in Grenada.
3. Caribbean Wildlife and Ecosystems:
    - Students collect data on Caribbean plant and animal life and different ecosystems.
      For example : Data collection on the plants found in the school garden.

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

1. Use of technology : There are numerous channels dedicated to statistics and data analysis that offer tutorials and explanations of various methods. Some popular channels include Khan Academy, StatQuest with Josh Starmer, and Crash Course Statistics.

https://www.khanacademy.org/math/cc-2nd-grade-math/x3184e0ec:data/cc-2nd-bar-graphs/e/solving-problems-with-bar-graphs-2

https://www.khanacademy.org/math/cc-2nd-grade-math/x3184e0ec:data/cc-2nd-line-plots/e/solving-problems-with-line-plots-1

hhttps://www.helpteaching.com/questions/Statistics_and_Probability_Concepts/Grade_2ttps://www.splashlearn.com/math/data-handling-games-for-2nd-graders

Practical Exercises and Projects: To reinforce students' understanding of statistical methods, it's essential to apply them to real-world problems. For example : Use classroom data, school data, social media and use observations from outside.

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

Real-Life Scenarios

Present students with real-world scenarios that require them to analyze and interpret data from various sources. This challenges them to think critically, apply statistical techniques, and draw meaningful conclusions.

Provide resources or access to databases where students can find relevant datasets for analysis.

Collaborative Data Projects:

Assign group projects where students work together to collect and analyze data on a particular topic of interest.

Guide students through the process of data collection, organizing, and presenting their findings to the class, with authentic data and experience, and the complexities of real-world data analysis.

Data-Based Problem Solving:

Present students with real-life scenarios that involve making decisions based on given data sets.

Guide them to analyze the data and draw conclusions to solve the problem or make an informed choice.

Elements that are integrated across subjects:

Mathematics and Language Arts:

Question: Can we create a bar graph representing the number of books read by different characters in a storybook, and then write a paragraph comparing their reading habits?

Conclusion: By combining mathematical skills in creating the graph and language arts skills in writing a comparison paragraph, students develop a deeper understanding of both subjects while practicing data analysis and communication.

Science and Social Studies:

Question: If we collect data on the types of plants grown in different regions and represent it in a line plot, can we analyze the correlation between climate and plant diversity?

Conclusion: By examining plant data across regions, students integrate scientific concepts related to climate and ecosystems with social studies knowledge about different geographical areas, fostering a holistic understanding of the topic.

Mathematics and Art:

Question: Can we create a logic diagram representing different geometric shapes and use it to classify and sort shapes based on their attributes?

Conclusion: By integrating mathematical concepts of shape classification and artistic representation, students develop visual thinking skills and reinforce their understanding of geometric properties.

Language Arts and Social Studies:

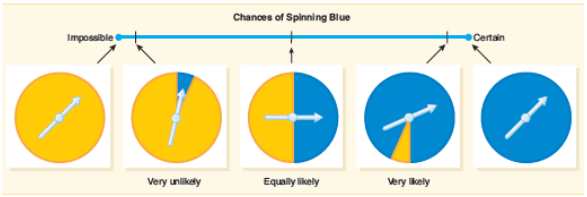
Question: If we analyze data on the population of different ethnic groups in our community and create a bar graph, how can we write a persuasive paragraph promoting diversity and cultural understanding?

Essential Learning Outcome: Data Handling 2.3

Introduction to the Subject: Data is gathered information - especially facts or numbers- that can be used to find out things or to make decisions when examined. Data handling is the process of gathering, recording, and presenting the data or information in a way that is meaningful to others. Good questions are an integral part of data collection. As well, data collection provides a way to connect mathematics to other subject areas. The data collected can then be analysed to make data-driven decisions in the real world. Probability is an essential tool in applied mathematics and mathematical modelling. It is also an essential tool in statistics. A probability describes mathematically how likely it is that something will happen.
Strand (Topic): Data Handling and Probability
Essential Learning Outcome 2.3 : Using Statistical Methods to Analyse Data - Predicting and describing the likelihood of events.
Grade Level Expectation: 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 complementary events happening, and use that likelihood to make predictions and informed decisions.

Specific Curriculum Outcomes	Inclusive Assessment Strategies	Inclusive Learning Strategies
Students should be able to: 1. Describe the likelihood that events will happen, and use that information to make predictions. 2. Use mathematical language, including the terms "impossible", "possible", and "certain", to	**SCO1 and 3** **Real-Life Scenarios:** Present students with real-life scenarios or situations and ask them to make predictions about what is likely to happen. This can be done through role-playing, where students act out different scenarios and make predictions based on the given context.	**SCO1 and 3** Provide opportunity for students to interact with a list of activities that is certain, impossible or possible to happen with justifications. For example,

describe the likelihood of complementary events happening. 3. Use the likelihood that an event will happen to make predictions and informed decisions.	Example Scenario: *"You are planning a beach day with your friends. What do you think is likely to happen during the day? Share your predictions."* **SC02** **Task-based Assessment:** Provide students with a set of scenarios or events and ask them to describe the likelihood using mathematical language. Present them with complementary events, where one event happening means the other event cannot happen. Assess their ability to use terms like "impossible," "possible," and "certain" to describe the likelihood of these events. **Example Scenario:** "Rolling a standard six-sided die, describe the likelihood of getting an odd number and getting an even number."	Retrieved from: *Van de walle et al.(2018)* - It will rain tomorrow. - Drop a rock in water and it will sink. - A sunflower seed planted today will bloom tomorrow. - The sun will rise tomorrow morning. - A hurricane/tornado will hit our town. - In an election, candidate A is elected. - If you ask someone who the second U.S. president was, they will know. - You will have two birthdays this year. - You will be in bed by 9:00 P.M. Create a visual scale with symbols or colors to indicate low likelihood, medium likelihood, and high likelihood. Show examples of events and place them on the scale based on their likelihood. Have students make predictions and conduct experiments using the terms certain, impossible and possible. For example, Ask students what you think will happen if I flip a coin 10 times. Listen to this small group discussion of students' intuitions about what will happen when a coin is flipped ten times and compare their predictions to actually flipping a coin ten times. Presenting probability on a number line from 0 (impossible) to 1 (certain) provides a visual representation of how likely an event can be. The number line can be connected to spinners. For example:

		 Retrieved from: *Van de walle et al.(2018)* Post the probability continuum in the classroom, where it can be used as a reference for other opportunities to talk about how likely something is. Provide opportunities for students to discover that some things change in their probability; for example, the chance of a Rainy day could be posted and moved from day to day.

Useful Content Knowledge for the Teacher about the Outcome:

Probability Vocabulary:

- Mathematical language associated with probability. Key terms include "impossible" (an event that will not happen), "possible" (an event that could happen but is not guaranteed), and "certain" (an event that will definitely happen).

0. Likelihood Terminology:

    - Terms related to the likelihood of events occurring, such as "likely," "unlikely," "very likely," and "very unlikely." Help students understand the varying degrees of probability associated with different events.

0. Probability Scale:

- Interpret and use a probability scale or a probability line. This visual tool helps them understand and represent the likelihood of events on a continuum from impossible to certain.

0. Complementary Events:
    - Two events that together encompass all possible outcomes. For example, in the context of flipping a coin, heads and tails are complementary events. Help students understand that the sum of the probabilities of complementary events is always equal to 1.

0. Predictions and Decisions:
    - Probability can be used to make predictions and informed decisions. Guide them in using the likelihood of events to anticipate outcomes and make choices based on the probability of success or failure.

0. Probability Language in Context:
    - Show students how probability language is used in everyday situations. Provide examples where probability is relevant, such as weather forecasts, game outcomes, or the likelihood of choosing a certain color from a bag of colored counters. Encourage students to discuss and make predictions using appropriate mathematical language.

0. Data Collection and Analysis:
    - Incorporate activities that involve collecting and analyzing data to determine probabilities. For example, have students conduct surveys or experiments, record results, and use the data to make predictions and draw conclusions.

0. Problem-Solving Strategies:
    - Teach problem-solving strategies that involve using probability. Encourage students to break down problems, identify possible outcomes, calculate probabilities, and make informed decisions based on the likelihood of events.

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

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

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

1. Traditional Games and Sports:
   - Introduce students to traditional Caribbean games and sports, such as marbles, cricket, or dominoes. Discuss the likelihood of certain outcomes occurring during these games and encourage students to use terms like "impossible," "possible," and "certain" to describe the likelihood of winning or losing.

2. Caribbean Weather and Climate:
   - Explore the weather patterns and climate of the Caribbean region. Discuss the likelihood of different weather events, such as hurricanes, rain showers, or sunny days. Help students use mathematical language to describe the likelihood of these events occurring.

3. Cultural Festivals and Celebrations:
   - Discuss Caribbean cultural festivals and celebrations, like Carnival or Junkanoo. Explore the likelihood of different events happening during these celebrations, such as parades, performances, or fireworks displays. Encourage students to make predictions about the occurrence of specific events using mathematical language.

4. Traditional Superstitions and Beliefs:
   - Introduce students to traditional Caribbean superstitions and beliefs related to predicting events. Discuss beliefs about luck, fortune-telling, or omens. Explore how probability concepts can be used to analyze the likelihood of these predictions coming true.

5. Caribbean Wildlife and Ecosystems:
   - Explore the diverse wildlife and ecosystems found in the Caribbean, such as coral reefs, rainforests, or unique animal species. Discuss the likelihood of spotting certain animals or experiencing specific natural events in these environments.

6. Storytelling and Folklore:
   - Share Caribbean stories, legends, and folklore that involve predictions or the likelihood of events happening. Engage students in discussions about the probability of different outcomes in these narratives and encourage them to express their predictions using mathematical language.

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

1. "The Doorbell Rang" by Pat Hutchins:

- This picture book introduces the concept of probability through a story about sharing cookies. Students can discuss the likelihood of different outcomes as more people arrive and the cookies need to be divided.

2. "Likely or Unlikely? A Collection of Conundrums for Kids" by Brian P. Cleary:
    - This book provides engaging scenarios and encourages students to determine the likelihood of different events happening. It helps build their understanding of terms like "impossible," "possible," and "certain" in a fun and relatable way.
3. Probability Games:
    - Use interactive online games like "Probability Fair" (https://www.sheppardsoftware.com/mathgames/probability/ProbabilityFair.htm) or "Probability Pond" (https://www.ixl.com/math/grade-2/probability-pond) to engage students in practicing probability concepts through gameplay.
4. Probability Worksheets and Activities:
    - Websites like Education.com (www.education.com) and Super Teacher Worksheets (www.superteacherworksheets.com) offer a variety of probability worksheets and activities for grade 2 learners. These resources provide practice in describing likelihood and making predictions.
5. Math Manipulatives:
    - Utilize manipulatives like spinners, dice, or coin replicas to provide hands-on experiences with probability. Allow students to experiment with these tools and discuss the likelihood of different outcomes.
6. Probability Sorting Activities:
    - Create sorting activities where students categorize events based on their likelihood of happening. Provide picture cards or objects that represent different events, and have students sort them into categories like "impossible," "possible," or "certain."
7. Real-Life Data Analysis:
    - Collect and analyze real-life data to explore probability concepts. For example, conduct surveys within the classroom or school community to gather data on students' favorite foods, activities, or colors. Students can then use the data to make predictions and draw conclusions.
8. Classroom Discussions and Group Activities:

- Foster classroom discussions and group activities that involve predicting and discussing the likelihood of events. Encourage students to share their reasoning and use mathematical language to support their predictions.

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

1. "What Are the Odds?: Chance in Everyday Life" by Michael J. Orloff:
   - This book explores probability in everyday situations and challenges students to think critically about the likelihood of events happening. It introduces more advanced concepts while still using relatable examples for grade 2 learners.
2. Online Interactive Simulations:
   - Websites like Math Playground (www.mathplayground.com) and NCTM Illuminations (illuminations.nctm.org) offer interactive simulations and games that involve probability. These resources provide challenging scenarios for students to practice making predictions and analyzing likelihood.
3. Hands-On Experiments and Investigations:
   - Engage students in hands-on experiments and investigations that involve probability. For example, have them design and conduct experiments with spinners or dice to collect data and analyze the likelihood of certain outcomes.
4. Mathematical Challenges and Puzzles:
   - Present students with mathematical challenges and puzzles that require them to apply probability concepts. Websites like Math is Fun (www.mathsisfun.com) and NRICH (nrich.maths.org) offer a collection of challenging math problems for grade 2 students.
5. Real-World Problem-Solving:
   - Provide students with real-world problems that require them to analyze likelihood and make predictions. For example, present them with scenarios where they need to estimate the probability of certain events happening, such as winning a game or finding a specific item in a bag.
6. Problem-Solving Apps:
   - Explore educational apps that focus on probability and critical thinking skills. Apps like "DragonBox Numbers" and "MathLand" offer challenging math puzzles and activities for grade 2 learners.

7. Collaborative Data Projects:

Assign group projects where students work together to collect and analyze data on a particular topic of interest.

Guide students through the process of data collection, organizing, and presenting their findings to the class with authentic data and experience the complexities of real-world data analysis.