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NEW COUNTDOWN

THIRD EDITION

ENHANCED BLENDED EDITION

Lesson Plans

SPACE FOR TITLE VERSO

Contents

1 Whole Numbers and Operations

Lesson Plan

Plan Ahead/ Specific Learning Objectives:

- Identify the place values of numbers up to one hundred thousand (100 000).
- Read numbers up to one hundred thousand (100 000).
- Write numbers up to one hundred thousand (100 000).
- Write numbers in words up to one hundred thousand (100 000).
- Compare and order numbers up to 5-digits.
- Add numbers up to 5-digits.
- Solve real-life number stories involving addition of numbers up to 5-digits.
- Subtract numbers up to 5-digits.
- Solve real-life number stories involving subtraction of numbers up to 5-digits.
- Multiply numbers up to 4-digits by numbers up to 2-digits.
- Solve real-life situations involving multiplication of numbers up to 4-digit by 2-digit.
- Divide numbers up to 4-digits by numbers up to 2-digits.
- Solve real-life situations involving division of numbers up to 4-digit by a number up to 2-digits.
- Solve real-life situations involving division of 2-digit number by a 1-digit number.
- Solve real-life situations using appropriate operations of addition, subtraction, multiplication, and division of numbers up to 2-digits.
- Recognise a given increasing and decreasing pattern by stating a pattern rule.
- Describe the pattern found in a table or chart.
- Complete the given increasing and decreasing number sequence.

Time Duration: 12 Periods

Starter Activity/Let's Begin:

In grade 3, pupils have learnt to read and write 5-digit numbers and to interpret the place values of each digit. Use ***Math Flash*** points given on page ***2 of New Countdown 4*** to recall what they learnt in Grade 3. The learning experiences in this unit will extend the number system to 6-digit numbers with the use of number cards and place value cards. Mastery of place value concept will facilitate their understanding of the four operations algorithms in the later units. To make sense of big numbers (up to 100 000), pupils could be asked to find real-life examples of such numbers. Pupils could also be given the opportunity to use number line to compare numbers.

Ask pupils why numbers are important. They will have many real-life examples of how and why they use numbers and see them being used in their lives. Ask the pupils if they think that numbers are complicated. They have, so far, learnt a lot about numbers, and they realise

they have much more to learn. Ask them to justify their answers. Point out that everything they have learnt about numbers has been helpful for them when working with numbers. For example, knowing about place value made it much easier for them to add and subtract big numbers. Ask them to think out loud about how their knowledge of numbers improves the quality of their lives.

Lesson Commentary:

- Prepare two sets of 6-digit number cards in numerals and words. Put these cards in two baskets. In one basket put cards with numbers and label it as NUMERALS, and in the other put cards with numbers written in words and label it as NUMBERS IN WORDS. Divide the class into 4 groups A, B, C, and D. Tell pupils that the first competition will be between group A and group B. One member of group A will pick a card and read the number. Group B will listen to it carefully, then discuss among themselves and choose a member to write that number in figures on the white board and show it to the class. A blank Place Value Chart like the one given on page 5 of New Countdown 4 can be provided to the class to provide support. Now, group B will pick a card and group A will write the number in figures on the white board. Three cards will be picked by each group. The group with all correct answers will be the winner. Follow the same procedure for group C and group D. Next the two winner groups will compete against each other. This time you will read a number and the group that writes all correct answers first, will be the winner. Same activity can be carried out by reversing the process. This time group members will pick a card from the basket with numbers written in words. Instead of reading the number aloud, they will only show the card to the other group and ask them to write the number in figures.
- Read out five 6-digit numbers, and after each number, say a place value up to hundred thousand. Ask pupils to write them down, in digits, and circle the stated place value. Ask them to peer review at the end.
- This activity can be performed individually or in pairs. Prepare the activity cards for each student as the given sample. Pupils will add the rows horizontally and columns vertically and write the answer in the given space. Get the activity cards peer checked.

Sample Activity Card		
Complete these addition sums. Add the rows and columns to find the totals.		
35789	2954	
37820	26897	

- Ask pupil to add one more column to the above given table and write comparison statement using symbols for each pair of numbers. To provide support ask them to read the Remember and Hint points given on page 6 of New Countdown 4.
- Give pupils time at their desks to go through the activity cards in order to understand the given task well. This should be done silently. After, have pupils peer review, remind them to remember to write numbers in correct rows and columns.
- This activity can be performed individually or in pairs. Prepare the activity cards as the given sample. Provide each student with an activity card with subtraction sums of complex numbers. Time the activity and get the activity cards peer reviewed.

Sample Activity Card

Work out the difference between the pair of numbers:

2345 5432

Show working here:

- Give pupils time at their desks to go through the activity cards to understand the given task well. This should be done silently. After, have pupils peer review, remind them to remember to write numbers in correct rows and columns.
- Divide the class in groups of four and assign ***Challenge question given on page 11 of New Countdown 4*** to each group. The group that comes up with the correct answer first will be the winner. Ask them to explain how they reach to the correct answer.
- This activity can be performed individually or in pairs. Pupils have already multiplied and divided smaller numbers, therefore, it will not be difficult for them to perform multiplication/ division of complex numbers. Prepare the activity cards as the given sample. Provide each student with an activity card with subtraction sums of complex numbers. Time the activity and get the activity cards peer checked. Sample activity card is given below:

Javeria has a bag of 45 cherries to evenly split up into her 3 school lunches for the week. How many cherries will she get to eat each week?	- cherries each day.
Shahid started typing his story book over the weekend. He typed for 3 hours and completed 15 pages with 240 words on each page. How many words did he type in an hou?	- words in an hour.

- Ask pupils to explain how they solved these problems. Make it sure that pupils use the proper mathematical vocabulary while explaining the method ***(page 14 and 15 of New Countdown 4).***
- Let the children work in pairs. Give A4 sheets to each pair. Ask each pair to prepare at least five sums of completing 3-digit number patterns with 5 to 10 terms. Then swap the

sheet with his/her peer. Each partner will complete the sequence and define a rule how the next term is found. Next tell them to write whether the sequence is in ascending or descending order.

- Show them activity cards with simple multiplication and division word problems. Ask them to solve individually and write their answers on the white boards to share with other pupils.
- Make Flash cards of number pattern with a missing number. The sample Activity is given on ***page 23 of New Countdown 4.*** Give them 4 options to choose the correct answer.

Exercise Commentary:

Exercise 1a tests numbers' place value skills and the students' basic understanding of comparing numbers. ***Exercise 1b*** and ***1c*** tests basic arithmetical skills of mathematical operations when applied to numbers and can be used as a whole class discussion by taking feedback from the class. ***Question 8 and 9 of Exercise 1b*** can be used as practice for mental-math strategies. The questions in ***Real-life Story Sums*** are all practical applications of basic arithmetic operations. Question ***8 of Exercise 1c*** also tests pupils' basic understanding of units of time. This question deals with application of arithmetic operations on units of time. ***Math Lab Activity Handbook 4: Pages 2 - 16***

Plenary:

Numbers are seen everywhere in our daily life. We find numbers on price tags, phonebooks, and house addresses. Numbers are also found as page numbers in a book, age of people, in buying and selling, measuring length, mass, and capacity, and many more. Ask pupils if the answers they gave during the Let's Begin discussion have changed. Do they think that any of what they learnt during this unit could improve their lives? Ask pupils how they feel about learning different kind of numbers. Give them 5 minutes at the end of the discussion so that they can write a reflective essay.

2 Multiples and Factors

Lesson Plan

Plan Ahead/ Specific Learning Objectives:

- Identify divisibility rules for 2, 3, 5, and 10.
- Use divisibility tests for 2, 3, 5 and 10 on numbers up to 5-digits.
- Identify and differentiate 2-digit prime and composite numbers.
- Find factors of a number up to 50.
- List the first ten multiples of a 1-digit number.
- Differentiate between factors and multiples.
- Factorise a number by using prime factors.
- Determine common factors of two or more 2-digit numbers.
- Determine common multiples of two or more 2- digit numbers.

Time Duration: 8 Periods

Starter Activity/Let's Begin:

Introduce this unit as a continuation of multiplication and division. Before explaining the concept of factors and multiples reinforce multiplication tables of 2 to 10. Tell them that a factor of a number is a number which divides the number completely i.e. with no reminder. A multiple is a number that is attained by multiplying a number by another number. You can explain the topic by using multiplication and division facts. Like 3 x 2 = 6 means 6 is a multiple of 2 and 3. Now 6 ÷ 2 = 3 means 2 is a factor of 6, similarly 6 ÷ 3 = 2 means 3 is a factor of 6.

Lesson Commentary:

- First revise the divisibility rules with the class. Let the pupils work in pairs. Provide each pair with an activity card (sample given below). Time the activity and announce the winning pair, who finished first with all correct answers. You can give the printout of the ***rules given on page 25 of New Countdown 4*** to support the pupils.

Use the divisibility rules to check whether each given number is divisible by 2, 3, 5 or 10. Write Yes or No.				
Number	Divisible by 2	Divisible by 3	Divisible by 5	Divisible by 10
18702	Yes	Yes	No	No
24900				
15672				
87534				
42207				
59345				

- Each pupil will perform this activity independently. Provide students with the activity cards and allow them some time to solve the questions.

Activity Card

Identify the prime numbers and add them together

1 3 7 11 15 19 23 6 10 16 18 25

What is the total off all the prime number? _____

Complete the equations and circle the answers that are prime.

a) 7x5= b) 15+14= c) 10+11=

d) 12+2= e) 60-29= f) 4x8=

- Ask pupils to colour the ***Number Chart given on page 30 of New Countdown 4*** according to the steps given on the same page. Discuss the result of the activity with them. Ask related ***questions given on page 31*** to conclude the activity.
- Make plenty of cut-outs of multicolour flowers and place them in a basket. Make cut-outs of large flowerpots according to the number of students. On each flowerpot, paste different numbers that you want your pupils to find the factors of. Ensure the numbers are bold and clearly visible. For each number, ask the students to find all the factors for each of the numbers and write them over the flowers. Put the flowers back into the basket. Now, give one flowerpot to each student and have them sort the flowers from the basket with correct factors of the numbers written on the flowerpot. Ask them to paste the flowers on their flowerpots. You can make the activity more challenging by setting a time limit.
- To find all possible factors of numbers and common factor of two or more numbers, prepare a worksheet as shown. Same type of worksheet can be prepared for finding all possible factors of numbers and for finding common multiple of two or more numbers.

How many different numbers can you use to divide 12? Write the factors below:
How many different number can you use to divide 16? Write the factors below:
How many factors are common? Write them below:

- Make pairs of the class pupils and assign Challenge given on page 45 of New Countdown 4 to each pair to solve the given questions. Take feedback from them to discuss their results.

Exercise Commentary:

Exercise 2a is about applying divisibility rules. This can provide an introduction to the topic. ***Questions 1 and 2 of Exercise 2b*** require pupils to fill in the blanks and write true or false. ***Questions 3 has MCQs and Questions 4 to 6*** test the basic skills of finding prime factors of numbers. In ***Exercise 2e,*** the questions given under the heading of ***Higher order thinking skills*** deal with the real-life applications of factors of numbers. These questions can be assigned in pairs or in groups to motivate pupils, encourage active learning, and develop key critical thinking and decision-making skills. ***Math Lab Activity Handbook 4: Pages 17-21***

Plenary:

Ask pupils what they have learnt in this unit. Can they relate any of it to their daily lives? Tell them a number story and then encourage them to create their own. Allow them to move the conversation in whichever direction they please,

but make sure it remains relevant to the unit, giving them cues where necessary. Ask the pupils how they might use factors and multiples in their daily lives from now on. Discuss with pupils if they found it hard to move from multiplication tables to factors and multiples. Spend 5 minutes on this discussion, and then give them 5 minutes to write a reflective paragraph.

3 Fractions

Plan Ahead/ Specific Learning Objectives:

- Recognise like and unlike fractions.
- Compare two unlike fractions by converting them to equivalent fractions with the same denominator.
- Simplify fractions to the lowest form.
- Identify (unit, proper, improper) fractions and mixed numbers.
- Convert improper fractions to mixed numbers and vice versa.
- Arrange fractions in ascending and descending order.
- Add fractions with like denominators.
- Subtract fractions with like denominators.
- Multiply a fraction (proper, improper), and mixed number by a whole number.
- Multiply two fractions, proper, improper, and mixed numbers.
- Divide a fraction (proper, improper) and mixed numbers by a whole number.
- Analyse real-life situations involving fractions by identifying appropriate number operations.

Time Duration: 12 Periods

Starter Activity/Let's Begin:

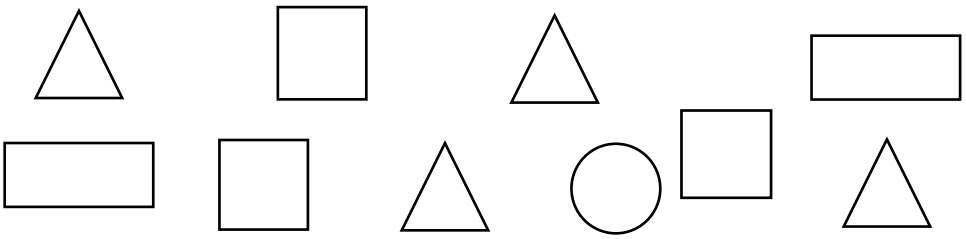
Ask the class to discuss how one might use fractions in their real lives. Examples they might give you from what they have learnt in previous classes may include cooking, or for working with objects that have multiple parts. Ask them to think about why we use fractions, instead of using whole numbers. For example, saying three slices of pizza might be simpler then saying three-eighth of a pizza. As they discuss whether this would be workable, encourage them to use the real-life examples discussed earlier. Assign ***questions given on pages 53 to 55 of New Countdown 4*** in pairs to recall whatever they have learnt previously. Ask them to refer to the ***Example boxes*** while solving the questions to provide support and guidance.

Lesson Commentary:

- Prior conducting the activity brainstorm for the method of making fractions equivalent. The ***figures and format given on pages 56 and 57*** would help them to make equivalent

fractions. Prepare chits with fractions, with varying denominators. Ask pupils to come up to the board in pairs and pick out a fraction chit each. If they get like fractions, ask them both to choose again. Once they have picked, they must both compare them by working out, on the board, to find who has the greater fraction and who has the lesser one, or, if they are equal. As soon as they work out the answer, ask the rest of the class to review their work. Allow up to seven pairs to have a go, and once you have at least five pairs of unlike fractions, make groups of five to seven, handing out blocks, rubber bands, and fraction charts. Ask pupils to work together to compare pairs of fractions. Remind them that if they do not find the blocks helpful, they may use fraction charts or if they prefer, can draw diagrams, and that they should try to simplify each fraction to its lowest form if they are stuck. They will know it is in its lowest form if it is denominator and numerator do not have a common factor. Encourage them to find the easiest way to make these calculations, keeping in mind that they may each have a different answer. Ask them to make note of any tricks they may want to share for later.

- Prepare worksheet as shown. Use variety of interesting ideas for enhancing the concept of proper, improper fractions, unit fraction, and mixed numbers.



Look at the shapes and answer the questions given below	Write the fraction here	Type of fraction
1. How many shapes are there?		
2. What fraction of the shapes are squares?		
3. What fraction of the shapes are rectangles?		
4. What fraction of the shapes are triangles?		
5. What fraction of the shapes is the circle?		
6. What fraction of the shapes are not triangles?		
7. What fraction do the triangles and the circle represent altogether?		
8. Which shape has the greatest fraction?		
9. Which shape has the smallest fraction?		

- ***This pairs with Math Lab page 27***

  There are different types of fractions. Write unit, proper, improper fractions, and mixed numbers on the board. Ask pupils if they can explain what any of them are, if they cannot, put an example in front of each name, and ask them if they get any idea from

them. Add two more examples to each type and prompt the class to discuss them. If they are not able to reach a conclusion, explain that in a proper fraction the numerator is always smaller than the denominator, while in an improper fraction the numerator is always equal to or bigger than the denominator. Mixed fraction is made up of a proper fraction and a whole number. Mixed fractions can easily be converted into improper fractions and vice versa. Unit fractions are fractions with one as a numerator. Remind pupils that a unit fraction is also a proper fraction. Go over this explanation a few times and ask the class to give you more examples of each type. Write the following fractions on board and ask the pupils to identify and make groups of proper, improper, and mixed fractions. Once they have sorted out different types of fractions, tell them their next task is to convert improper fractions to mixed fractions and vice versa.

1. $3\frac{2}{15}$, $\frac{7}{3}$
2. $\frac{1}{6}$, $2\frac{1}{5}$
3. $\frac{1}{7}$ $1\frac{4}{7}$
4. $\frac{16}{34}$, $2\frac{2}{17}$
5. $\frac{3}{8}$, $\frac{6}{4}$
6. $4\frac{16}{3}$, $\frac{17}{4}$
7. $1\frac{3}{25}$, $\frac{17}{5}$
8. $7\frac{1}{5}$, $\frac{2}{12}$
9. $\frac{21}{20}$, $\frac{13}{40}$
10. $\frac{14}{3}$, $\frac{2}{21}$

- Prepare a bowl full of various types of fractions. Make groups of at least six each and ask each pupil to pick out a fraction. Ask to pick out five fractions and arrange them in ascending order, within their groups. Give them enough time to convert and remind them that even though converting fractions into their simplest form may be a good starting point when trying to order them sometimes more needs to be done. If any group is struggling, ask them to try to work it out on the board, and prompt the rest of the class to help out. Since this is a very new concept, allow pupils to try to work it out on their own, however if they. are stuck, help them get to the answer. If all the groups are able to order their fractions, ask them to place their chits back into the bowl, shuffle them, and hand them out again so that the groups can arrange them in descending order.
- ***This pairs with Math Lab page 27***

  Go through the following questions on the board with the class.

  1. $\frac{3}{9}+\frac{2}{9}$ 2. $\frac{9}{10}-\frac{1}{10}$ 3. $\frac{5}{15}+\frac{2}{15}$

  If the class seems to be comfortable with adding and subtracting like fractions, introduce a set of blocks. Have at least ten pairs of blocks bound together with rubber bands beforehand. Write 2/6 + 1/3 on the board. Explain that even though these fractions do not have the same denominator, they can still be added. Be sure to mention that they

are called unlike fractions because like fractions have the same denominator. Place the blocks where everyone can see them, and draw the diagram on the board, matching the blocks to it. Explain that the blocks that are bound together still represent one part. But also point out that the number of blocks for each fraction is the same. Then take apart the bound together blocks, writing on the board (2/6 = 1/3). Explain that although different numbers were used to represent these fractions, they have the same value. So while the fraction is 1/3 it can also be expressed as 2/6.

Similarly, 2/6 can be simplified into 1/3. Simplification means to simplify a fraction to its simplest form. This is often done to create like fractions so that they can be added or subtracted, but we may also simplify fractions just so that they were easier to remember. When working with objects like pizza, numbers remain one digit, but if someone were to refer to thirty pages out of a one-hundred paged book will be written as 30/100 or 3/10 and would still be easier to say three-tenth of a book. Return to the question and ask pupils if they can add the two fractions now that they know that they can be simplified into like fractions.

- Explain the method of addition and subtraction of fractions using the fraction discs or the similar ***figures as given on page 69 and 71 of New Countdown 4.***
- Create groups of three to five each and ask them to solve the following questions using blocks and rubber bands, and any other manipulatives they think may be helpful.

1. $\frac{2}{15} + \frac{5}{15}$
2. $\frac{1}{6} + \frac{2}{6}$
3. $\frac{1}{5} + \frac{13}{5}$
4. $\frac{16}{32} + \frac{2}{32}$
5. $\frac{3}{7} + \frac{6}{7}$
6. $\frac{16}{30} - \frac{16}{30}$
7. $\frac{3}{15} - \frac{7}{15}$
8. $\frac{1}{5} - \frac{2}{5}$
9. $\frac{21}{25} - \frac{13}{25}$
10. $\frac{4}{8} - \frac{2}{8}$

- Reinforce the concept of four operations involving fractions before starting this activity. Prepare the following activity card for each student.

Activity Card

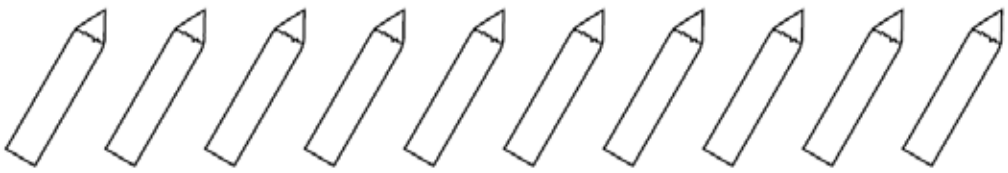
1. Manahil loves jam and has a great jam recipe. She uses $\frac{3}{4}$ kg of strawberries and $\frac{1}{2}$kg of blueberries to make one bottle of jam. How many kilograms does she need altogether to make one bottle of jam?
2. Sabeen made 8 $\frac{5}{6}$litres of lemonade for a party. At the end of the party, she had 3 $\frac{1}{6}$ litres left. How many litres of lemonade were consumed? Show your working below:

- Write on the board 2/5 × 2 and draw a diagram to represent it. Ask pupil to raise their hands to try and solve it. They may guess that the numerator should be multiplied by the whole number or that fractions can only be multiplied by fractions, whereas whole numbers can only be multiplied by other whole numbers. Explain that since fractions are numbers too, they can certainly be multiplied by whole numbers. Point out that since we can use number operations with mixed numbers, we can use them with whole numbers as well. We can solve this question by looking at the whole number, 2, as an improper fraction, meaning 2/1. Since the number 2 represents two wholes, 2/1 is equal to it. Show this on the board with diagrams. Now that the question is 2/5 × 2, explain that the numerator will be multiplied by the numerator, while the denominator will multiply with denominator, so the answer will be 4/5. Unlike addition and subtraction, there is no need to simplify fractions when multiplying, but mixed numbers do need to be converted to improper fractions. If at the start, pupils had guessed that only the numerator would multiply, tell them that although they were technically right, they must keep in mind why that is.
- Reinforce the concept of four operations on fractions. Prepare a sample of an activity sheet as shown below. Give each pupil an A4 sheet, ask them to make a question involving multiplication division of fractions and related to real-life. Once they have written the questions ask them to swap the sheet and solve. When the task is complete, get it peer checked.

1. $12\frac{1}{2}$ kg of tomatoes are divided equally into 4 baskets. What will be the weight of tomatoes in each in one basket?
2. Faiz travelled $5\frac{1}{4}$ km in one day. If he travels the same distance every day, how many kilometres will he cover in 8 days?

- Prepare the worksheet as given below.

Basim buys a new colouring box. He has a picture of 10 pencils. He colours the pencils as given below:



First, he colours $\frac{1}{10}$ of the pencils. (Colour them red).

Then, he colours $\frac{1}{3}$ of the remaining pencils. (Colour them blue).

Lastly, he colours half of the remaining pencils. (Colour them green).

How many pencils are left without colour? Write your answer as a fraction also.

_____

Exercise Commentary:

Questions 1 to 3 of Exercise 3a require pupils to attempt MCQs, True and False, and fill in the blanks. Questions 4 to 5 are given in a progression in such a way that start with identifying like and unlike fractions, then finding common denominators, and lastly comparing unlike fractions. Exercise 3b contains basic practice questions to convert improper to mixed numbers and vice versa. In Questions 4 and 5 of Exercise 3b, figures are given to test how pupils interpret the pictorial representation of fractions. In Real-life story sums of Exercises 3c and 3d, the problems are contextualised but are essentially testing the same skill. Encourage pupils to show all their working clearly when they have extracted all the information from the question. ***Math Lab Activity Handbook 4: Pages 22-43***

Plenary:

Fractions are used every day in our lives. Most times we use them indirectly. They are a vital part of measurements and are used in cooking, time, prescription of medicines, etc. Discuss with students different instances where they may have used or need to use proper and improper fractions. Ask them to make number stories about improper fractions. Allow them 5 minutes to discuss and come up with in a interesting real-life situations and then pair them up together so each student solve another student's number story.

4 Decimals

Lesson Plan

Plan Ahead/ Specific Learning Objectives:

- Recognise a decimal number as an alternative way of writing a fraction.
- Express a decimal number as a fraction whose denominator is 10, 100, or 1000.
- Identify and recognise the place value of a digit in decimals (up to 3-decimal places).
- Convert a given fraction to a decimal if:

  - denominator of the fraction is 10, 100 or 1000.

  - denominator of the fraction is not 10, 100 or 1000 but can be converted to 10,100 or 1000.
- Convert a decimal (up to 3-decimal places) to fraction.
- Add and subtract 3-digit numbers (up to 2 decimal places).
- Multiply a 2-digit number (up to 1 decimal place) by 10, 100, and1000.
- Multiply a 2-digit number with 1 decimal place by a 1-digit number.
- Divide a 2-digit number with 1 decimal place by a 1-digit number
- Solve real-life situations involving 2-digit numbers with 1 decimal place using appropriate operations.
- Round off a whole number to the nearest 10, 100, and 1000.
- Round off decimal (with 1 or 2 decimal places) to the nearest whole number.

Time Duration: 8 Periods

Starter Activity/Let's Begin:

A decimal is a fraction represented in a special form. Like the fraction 3/5 can be written as 0.6, when 0 is in the ones place and 6 is in the tenth place. The point between 0 and 6 in known as decimal point. Explain that not all numbers are whole numbers but there are lots of members in between there. Decimal is a fraction whose denominator is 10, 100, or 1000. Decimals can be converted to common fractions and vice versa. They can be added, subtracted, multiplied and divided using common methods of four operation but taking care of decimal point to be placed accurately.

Lesson Commentary:

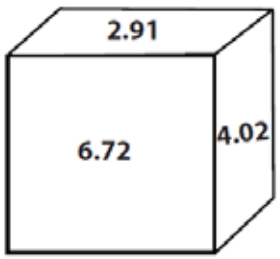
- Each pupil should perform this activity individually. Prepare fraction number card and decimal number cards as shown.

Fraction number card	Decimal number card
$\frac{14}{100}$	0.14

Make fraction number cards with denominator 10, 100, and 1000 and respective decimal number cards. Place the piles of fraction number cards and decimal number cards upside down on the table. Tell the pupils to take out their white boards. Then call one pupil and ask him/her to pick up one card from either of the two piles and show it to the class. Ask the rest of the class to write the respective fraction or decimal number on white board. Meanwhile, the pupil who picked the card will also find the respective fraction or decimal card from the pile. Share Examples given on page 85 of New Countdown 4 to explain them how we read a decimal number.

Make sure that he/she picks the correct card. Ask the pupils to show their answer written on the white board. Thumbs up for the correct answers.

- Give concept of tenths using fraction chart as given on page 86 and for the concept of hundredth give 100 square grid as given on page 87 of New Countdown 4.
- Make paper cubes with decimal numbers written on each face as shown above. Or if you have a dice, paste a sticker on each face with different decimal numbers written on it. Also prepare a worksheet as shown, for each pupil.



Add/Subtract Decimals	
1.	2.
3.	4.

Divide the class into 4 or 5 groups and distribute two dice to each group and, worksheets and ***place value charts (page 88 and 89)*** for all members as this is activity is to be performed individually. Each pupil will roll two dice twice, note the decimal numbers in the decimal sheets, and then add and subtract them. Ask them to peer check the results. The group which completes the task first with all correct answers is the winner.

Exercise Commentary:

Questions 4, 5, and 6 Exercise 4a deal with the various pictorial representations of decimal numbers for example, number line and hundred square grids. ***Questions 7*** requires pupils

to use place-value chart to write the decimal numbers. The rest of the exercise contains questions to convert fractions into decimals and vice versa. ***Exercise 4b*** tests the basic skills of rounding off numbers. Encourage pupils to use number line while solving these questions. ***Exercise 4c*** contains questions on four operations with decimal numbers. This exercise should be used as appropriate for consolidation. Real-life Story Sums expects pupils to comprehend the word problems and extract the required data. ***Math Lab Activity Handbook 4: Pages 44, 45, 46***

Plenary:

Decimal numbers are an extension of whole numbers while tenths and hundreds are linked to fractions. Pupils might not realise it, but they certainly must have

made use of decimals in their lives at some point. Remind them that the introduction of the new concept does not change the math, and even if they haven't previously learned about decimals, they have still understood that a decimal number is often used to represent a fraction of whole.

5 Measurement

Plan Ahead/ Specific Learning Objectives:

- Use standard metric units to measure the length of different objects.
- Convert larger to smaller metric units (2-digit numbers with one decimal place).
  - kilometres into metres
  - metres into centimetres
  - centimetres into millimetres
- Add and subtract measures of length in same units.
- Use standard metric units to measure the mass of different objects.
- Convert larger to smaller metric units (2-digit numbers with one decimal place).
  - Kilograms into grams
  - Grams into milligrams
- Add and subtract measures of mass in same units.
- Use standard metric units to measure the capacity of different containers.
- Convert larger to smaller metric units (2-digit numbers with one decimal place) litres into millilitres.
- Add and subtract measure of capacity in same units.
- Solve real-life situations involving conversion, addition and subtraction of measures of length, mass and capacity.
- Read and write the time using digital and analogue clocks on 12-hour and 24-hour format.
- Convert hours to minutes and minutes to seconds.
- Convert years to months, months to days, and weeks to days.
- Add and subtract measures of time without carrying and borrowing.
- Solve simple real-life situations involving conversion, addition, subtraction of measures of time.

Time Duration: 8 Periods

Starter Activity/Let's Begin:

Pupils are familiar with units from the previous class but have not converted them. Explain

that certain number of smaller units make up one bigger unit. The system of measurement based on multiples of 10 is called the metric system. Explain that the standard units of length are kilometre (km), metre (m), and centimetre (cm), for mass they are kilogram (kg) and gram (g), and that of volume/capacity are litre (l) and millilitre (ml).

Conversion unit of each is 1 km = 1000 m 1 kg = 1000 g 1 l = 1000 ml

Make note of this on the board so that pupils can write it down. Prompt them to discuss when one would need to convert units, or how one would choose the right unit to make calculations with. Ask them for real-life examples of what they could measure. The following activities will help pupils read the measuring scales to find lengths in kilometre, metre, centimetre, and millimetre, to find masses in kilogram, gram, and milligram, and the measuring scales to find capacity in litre and millilitre. Prepare a separate activity sheet for length, mass, and capacity.

Lesson Commentary:

- Make sure every pupil has a ruler, or a measuring tape showing centimetres and millimetres, and tell them that they have 30 seconds to find something that is not too bulky that they want to measure the dimensions of. Examples include books, tabletops, pencils, erasers, or pencil cases. Once they have each selected an object, make groups of three, and ask them to help each other measure their objects' height and width in centimetres, rounding up to only use whole numbers. Explain that height is the length from top to bottom, and width is the length from side to side. If there are oddly shaped objects, encourage pupils to work together to work out the best ways to measure them. Ask each group to make a list of their objects with the measurements on A4 sheets, making sure to mention the units.
- Shuffle the groups from the previous activity and redistribute the A4 sheets with the measurements. Once every group has a sheet, ask them to convert the measurements from previous activity (centimetres in decimals) into millimetres, and make note of the measurements in centimetres (in decimals). The ***Conversion table*** is given on ***page 112 of New Countdown 4.***
- Provide the given task sheet to the class. Ask them to complete the sheet.

The weight of individual books is given below.

Book 1: 8.23 kg	Book 2: 7.95 kg	Book 3: 5.58 kg
Book 4: 2.41 kg	Book 5: 6.47 kg	Book 6: 9.36 kg

Task 1: Which set of 3 books do I put on each shelf?

Shelf A: _____ kg + _____ kg + _____ kg = 20 kg

Shelf B: _____ kg + _____ kg + _____ kg = 20 kg

Task 2: Covert mass of each book into grams.

Book 1: 8.23 kg = _____ g

Book 2: 7.95 kg = _____ g

Book 3: 5.58 kg = _____ g

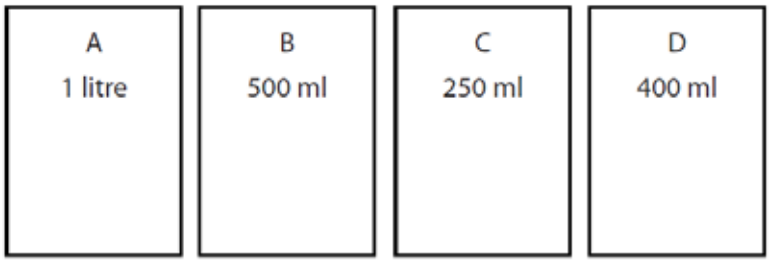
Book 4: 2.41 kg = _____ g

Book 5: 6.47 kg = _____ g

Book 6: 9.36 kg = _____ g

Take feedback from each and discuss the answers.

- Recall the concept of capacity by discussing the Examples given on page 124 of New Countdown 4. Each sheet should have few pictures and some clues. For example, draw containers with different capacity and name them A, B, C, and D. Write some clues and ask children to read the clues carefully and identify who has which container.



Clues:

Arif: I have 1000 ml. Answer: Container_____

Azam: I have exactly quarter of a litre. Answer: Container _____

Amina: I have more than 300 ml but less than 500 ml Answer: Container _____

Saba: I have exactly half a litre. Answer: Container _____

- Take the pupils out of the classroom in the play area. Arrange 4 buckets or any other containers of capacity 4 litres and small jugs or containers of capacity 100 ml, 200 ml, 300 ml, and 500 ml respectively. Fill two buckets with water. Divide the pupils in four groups. Ask one group to fill one bucket with water using 500 ml jug. Ask another group to choose any small container to fill the other bucket. Instruct them to count carefully, the number of times they have used the small container to pour water in the bucket. Ask the two groups how many jugs they poured to fill their bucket. Repeat the activity with other two groups. Compare their results.

- Ask children to make recipes for different food items required for a birthday party. For example, a fruit punch. Write a few questions, swap with their partner to solve these real-life story sums.

To make fruit punch for two friends you need: 500 ml of orange juice 150 ml of lemonade 400 ml of pineapple juice 1. What is the total amount of liquid used to make a fruit punch for two people? 2. How much orange juice would be needed to make enough for four people?

- To begin with, tell the pupils that as a class activity, you will read out number stories involving measurement units (km, m, cm, mm, kg, g, mg, litre, and millilitre). Pupils should listen carefully and make note of the number sentences and then solve the sum. Tell pupils to come up with their own real-life number stories as realistic as possible and should involve addition or subtraction without grouping. After listening and making note of the number sentences, they should solve the sum in their notebooks.
- Prior to the activity, ask pupil to make a table or a clock showing equivalence between ***12-hr clock and 24-hr clock*** as given on ***page 130 and 131.*** Ask the pupils to prepare a list of activities they do from morning till night. Swap their worksheet with their partner to write whether the timein a.m. or p.m.

Activityre	Time	a.m. or p.m.
Wake up at	6:30	
Breakfast	7:15	

- Divide the pupils in pairs. Distribute the time sheet to each pair. Display digital clocks with different timings and ask pupils to choose any clock and start the activity. Tell them to first note down the starting time in the sheet and then write the time after every 5 minutes. They must start converting the time in minutes as soon as they note down a new time. If two or more pairs have chosen the same clock, then ask them to exchange their sheets and peer check the results.

Time (in hrs and min) after every 5 minutes	Time in minutes
Starting time:	

Example: Starting time: 11:15

Time in minutes: (11 x 60) min + 15 min = (660 +15) min = 675 min

- Prepare an activity sheet as shown below. Pupils can work independently or in pairs for this activity.

Telling Time Through Tick Tock	
Rabia wants to go to her aunt's house. She is timing how long it takes her to reach there.	
Write the time in the blank as time passes.	
Rabia starts her journey at	11.30 a.m.
Tick tock 5 minutes have passed.	_____
Tick tock 8 more minutes have gone by.	_____
Tick tock 11 more minutes have gone by.	_____
Tick tock 3 minutes have passed.	_____
Tick tock 22 minutes have passed.	_____
Tick tock 17 minutes have gone by.	_____
Tick tock 21 more minutes have passed.	_____
She has now reached her aunt's house. How long did she take to reach there?	_____ hrs _____min

- For this activity, set a time on an analogue clock. Ask pupils what time it shows. Once they give you the answer, ask them what time it would be after two hours. Then point at another number on the clock and ask what time it would be after four hours. Tell them that calculating a later time is the same as addition. Continue pointing at different time on clock and adding few hours to it. Similarly, explain that just like addition, where they counted forward on the clock, to subtract they just need to count backwards on the clock for subtraction. Ask pupils to prepare few questions based on addition and subtraction for their partner to solve. For example,

  4 o'clock + 3 hours, 6 o'clock + 6 hours, 9 o'clock –3 hours, 8 o'clock – 6 hours.
- Conduct the ***Activity given on page 133 of New Countdown 4*** to reinforce the concept of days, weeks, months, and years.
- Compile a list of birthdays of all the pupils' and paste it on the board. Ask each pupil to use a calendar to find out what day of the week each of their classmates' birthdays fall on. Ask pupils to calculate the difference in their and partner's age. Or calculate how many months or days are left to celebrate the birthday of their classmate.
- Ask pupils to compile a list of events happening in school. Mention the date and day. Tell them to calculate how many months or days are left to celebrate the next event.

Exercise Commentary:

Exercise 5a expects pupils to convert units of measurement of length. ***Question 11 of Exercise 5a*** can be assigned in pairs and discussion can be generated with their feedback.

Exercise 5b contains lots of practice at conversion of units of mass and Exercise ***5c deals with conversion of units of capacity. Real-life Story Sums of Exercise 5a, 5b, 5c, and 5d*** are 'problem-solving' type questions to stimulate interest. Encourage pupils to show all their working clearly when they have extracted all the information from the question. ***Question 3 of Exercise 5d*** can be conducted as an activity. Pupils could have been asked to make similar timetable from their routine activities. ***Math Lab Activity Handbook 4: Pages 47, 48, 49***

Plenary:

Time is a very important factor, and we find it inevitable in our daily life, for example, travelling, working and other activities involve time. Length, mass, and capacity are important in day-to-day life. The long and short distances (km and m), weighing grocery (kg and g), measuring liquid (l and ml) are units of measurements used in our daily life. The schedules, events, programmes, appointments, and meetings etc. involve time as the basic factor. Ask pupils what they think their daily lives would look like without all of these and how their lives are dependent on measurements. At the end of the discussion give them 5 minutes to write a reflective paragraph about they unit.

Perimeter and Area

Lesson Plan

Plan Ahead/ Specific Learning Objectives:

- Find perimeter of a 2-D figures on a square grid.
- Recognise that perimeter is measured in units of length.
- Find area of 2-D figures on a square grid.
- Recognise that area of a square is measured in meter square (m2) and centimetre square (cm2)

Time Duration: 5 Periods

Starter Activity/Let's Begin:

Recall the concepts of perimeter and area by discussing the points given in ***Math Flash on page 138 of New Countdown 4.*** Provide each student with cut-outs of square and rectangular shapes and square grid. Ask them to write the name of the shape on each cut-out. Paste cut-outs of rectangle and square on the given grids. Make them understand the difference between length and breadth.

Lesson Commentary:

- Ask pupil to count the number of squares covered by the shapes pasted on the square grids ***(page 139 of New Countdown 4).*** Explain them the difference between Area and perimeter of 2D shapes.
- Provide large sheet of squared paper and ask pupils to find the area covered by their hands. First, they need place their hand on the square grid and then draw its outline on the gid. Ask them to calculate the number of squares covered by the shape. Conduct the ***Activity given on page 143 of New countdown 4.***
- Use the shapes given on ***page 155 and 156 of New countdown 5*** to explain how to find the perimeter of these shapes drawn on a square grid and by using formula.
- Divide your class in groups of 4. Provide a meter ruler and a measuring tape to each group and ask them to find the area and perimeter of different objects from their surroundings. Conduct the ***Activity given on page 146 of New Countdown 4.***
- Draw the following figures on the board, one by one, and ask pupils to come to the front

of the class to help you find the area or perimeter. Try not to use the same pupils for both, so that more children can have a turn. Explain that area is finding how much space a shape has internally, and perimeter is more about the borders.

- Hand out chart paper and ask pupils to design their dream house. Remind them to make a rough sketch in their notebooks before using the chart paper. Tell them that there must only be straight lines, and they must only make shapes that are square or rectangular. They may assign their own measurements but will have to think realistically about what units to use. Once they are done, put the chart papers up around the class. Using these as an example, start a class discussion about how, even if it seems a shape is not taking up so much space, it can take up a large area. At random, choose chart papers and start to solve them on the board. Ask pupils to think about the formulas that are used to find area and perimeter. Ask them what rules they have noticed when working with area and perimeter. Spend about fifteen minutes using the chart papers to set an example, but as you do so, collect rules and ideas about the unit from the pupils and write them on the board. Make sure that they copy it down before the activity ends.

Exercise Commentary:

Questions 1 to 10 of Exercise 6 deals with the calculation of perimeter of square and rectangular regions and composite shapes including squares and rectangles only while Question 11 tests the skill of estimating area of irregular shapes on a square grid. ***Real-life Story Sums of Exercise 6*** require pupils to interpret the word problem correctly. Being able to work without a figure is an important skill, so encourage pupils to draw the figures first and then solve the problem. ***Math Lab Activity Handbook 4: Pages 51, 52***

Plenary:

Provide each pupil with a centimetre grid and ask them to draw a square using any measurements of their choice. Ask them to calculate the area and perimeter of their drawn squares. The pupils may then compare the area and perimeter with that of their classmates and find out whose square has the largest area.

Next ask pupils to prepare a question related to use of perimeter and area in real-life.

Activity Sheet
Your school's football association just built a new practice field that is 100 m long and 67 m wide. What is the perimeter and area of the new field?
Perimeter = _____ Area = _____

7 Geometry

Lesson Plan

Plan Ahead/ Specific Learning Objectives:

- Recognise and identify parallel and non-parallel lines.
- Recognise an angle formed by intersection of two rays.
- Measure angles in degree (o) by using protractor.
- Draw an angle of given measurement and use the symbol (o) to represent it.
- Differentiate acute, obtuse, and right angles.
- Measure angles using protractor where
  - Upper scale of protractor reads the measure of angle from left to right.
  - Lower scale of protractor reads the measure of angle from right to left.
- Identify right angles in 2-D shapes.
- Describe radius, diameter, and circumference of a circle.
- Recognise lines of symmetry in two-dimensional (2-D) shapes.
- Complete a symmetrical figure with respect to a given line of symmetry on square grid/ dot pattern.
- Compare and sort 3-D objects (cubes, cuboids, pyramids, cylinder, cone, sphere)

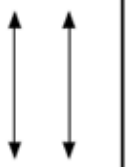
Time Duration: 5 Periods

Starter Activity/Let's Begin:

Referring to Math Flash given on page 155 of New Countdown 4, ask the class to volunteer any information they remember about shapes, and which shapes they can name. As they name them, ask them to come up to the board and draw them. Write the name of each shape down next to them. When they are done, if there is a circle, a square, a rectangle, and a triangle on the board, group them together, and tell the class that these are the shapes they should focus on. If one of them is missing, add it, and explain to the class what it is called. For this activity, include all the shapes on the board. Ask pupils if they see any similarities, or differences. Try to prompt them to be aware of the lines. Which ones are curved, and which ones are straight, even if the circle is the only shape on the board that does have a curved line.

Lesson Commentary:

- Have a short discussion about parallel and non-parallel lines with the students. Draw few lines on the board and ask them to identify. Give them the activity sheet and explain the task.

Activity Sheet					
Identify the parallel and perpendicular lines and write their names in the space given.					
					

- ***Assign Challenge*** questions given on page 158 of New Countdown 4 to the class. Have discussion in the class on the acquired results and their methods.
- Divide the class into group of 3 to 5 pupils each. Distribute activity sheets to the pupils. Allow pupils to move around their school and spend 10 minutes looking for different kinds of angles that they can identify in their surrounding. Ask them to note down their findings in the activity sheet. For example, they may spot a tree branch making an obtuse or an acute angle with the tree trunk etc. Pupils only need to identify the kind of angle that the object is making and not calculate it.

Activity Sheet	
Objects	Type of angles

- Ask pupils to bring strips of cards and a protractor. Conduct the angle ***Activity given on page 171 of New Countdown 4.***
- Distribute the following activity sheet to each student. Have a short discussion about the angles and lines with the whole class, and then let them solve the worksheet independently.

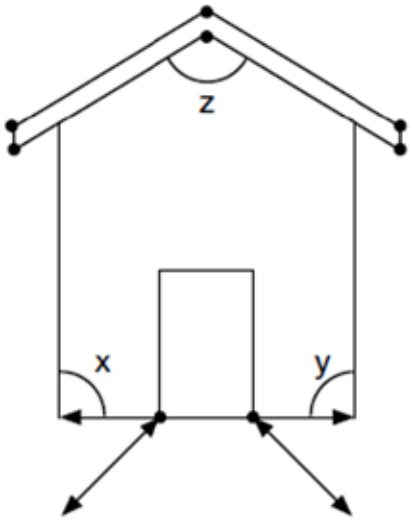
Look at the house and answer the following questions.

1. Identify a line segment in the given figure and mark it AB.
2. How many rays can you find in the given picture?
3. Find a pair of parallel lines and mark them CD and EF.
4. Find a pair of non-parallel lines and mark them PQ and ST.
5. Measure the following angles:

∠X =

∠Y =

∠Z =



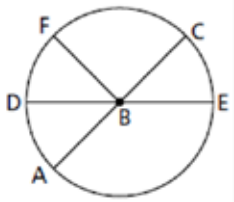
- The following will help you to assess if the pupils know what acute and obtuse angles are. Distribute blank paper chits to all pupils. Ask the pupils to write one measure of their choice for acute angle and one for obtuse angle on the paper chit given to them.

  Now ask the pupils to fold their chit and put them in the empty basket. Distribute blank A4 sheets to all pupils. Shuffle the chits, pass the basket around, and ask each pupil to draw a chit from it. They will now be required to draw the acute and obtuse angles written on the chit in their respective activity sheet. Spot check the measures of the angles for correction. At the end, let the pupils peer check the activity sheets
- Have a short discussion about the parts of a circle with the whole class. Distribute the activity sheet and explain the task to them.

Activity Sheet

Look the circle and write the answers.

1. Name the centre of the circle. _____
2. How many radii are shown in the given circle?
   _____
3. Name the diameters shown in the circle.
   _____



- Plan this activity a day or two before teaching it. To start with, divide the class into groups of 4 pupils each. Ask each group to discuss among themselves and decide which different circular objects they can and will bring from their homes. The objects may include, paper plate, bottle cap, CD, and disc etc. When the objects are brought in the class, call one group at a time in front along with their resources. Each group member will show their circular objects and identify only one part of the circle that is: circumference, centre, radius, and diameter.

  This activity will enable them to identify circles and their parts in real-life.

  Ask them to draw their object on the paper and label its radius, diameter, and circumference individually.
- On a sheet of paper paste a shape and draw a line of symmetry. Ask the children to try to copy the exact shape on the other side of the line.
- If available, use geoboards and coloured rubber bands for this activity. You can also make them yourself using pieces of wood with iron nails inserted into them. Mark a line in the middle and then using a rubber band make a square or any shape. Ask the children to try to copy the exact shape on the other side of the line.

Exercise Commentary:

Exercise 7a tests the skill of identifying types of lines, measuring, and drawing lines. Questions 7 to 9 are about parallel lines. ***Exercise 7b*** contains the basic questions on identifying and drawing lines of symmetry in 2D shapes. It is suggested to provide more 2D shapes for drawing lines of symmetry. ***Questions 5, 6, and 7 of Exercise 7c*** make pupils to reinforce the elements of angles whereas, ***Questions 4 and 9*** expect pupils to identify the types of given angles. ***Questions 11 to 13*** focus on the measuring the given angles using protractors. These questions test the skill of using protractor to measure the angle. Encourage pupils to show the placement of protractor while measuring first angle. ***Question 14*** require pupils to draw the angles with given measurements. ***Exercises 7d and 7e*** contain the questions on properties of circle and quadrilaterals. ***Math Lab Activity Handbook 4: Pages 50, 53 to 56***

Plenary:

Ask pupils to look around them and spot where they find uses of geometry. Guide them to observe different geometrical shapes and patterns in leaves, flowers, stamps, and so on. Discuss with them the constructionist of buildings, bridges, and monuments are based on geometrical concepts. Discuss with students how different lines and angles are used to form figures and shapes. Allow 5 minutes to the students to write a reflective essay on the importance of geometry in daily lives.

7 Data Handling

Lesson Plan

Plan Ahead/ Specific Learning Objectives:

- Read simple bar graphs given in horizontal and vertical form.
- Interpret real-life situations using data presented in bar graphs.
- Read line graphs.
- Interpret real-life situations using data using data presented in line graphs.
- Read pie chart.
- Interpret real-life situations using data presented in pie chart.

Time Duration: 5 Periods

Starter Activity/Let's Begin:

Make your class recall the concepts of graphs and charts to represent information. Ask them to go through the points given in ***Math Flash*** given on page ***190 of New Countdown 4.*** Recap the use of tally marking and completing a table of given data. Inform them that when information is organised in a table, it becomes useful to draw bar graphs. At this level, they do not need to draw bar or line graph, however, they can be shown several bar and line graphs to make them familiar with the presentation of to types of graphs, it will make the interpretation easier for them.

Lesson Commentary:

- To begin with, talk about the importance of having healthy breakfast in the morning. Distribute paper plates to each pupil. Ask pupils to write down what they had for breakfast that morning, and to draw a picture of it on the plate. If a pupil says he/she did not have breakfast, then they must write 'nothing'. Write few breakfast items such as milk, juice, cereal, fruits, toast, and eggs, etc. On board. Next ask pupils to read their list one by one. Use tally marks for each item (if a new item comes up add it to the list). Represent the data on a bar chart drawn on the board. Discuss the data and analyse the bar graph. Write few related questions on the board and encourage pupils to find the answers from the bar chart and write them on whiteboards. For example:

1. How many pupils had milk in the morning?
2. Which food is liked by most of the pupils?
3. Which food is least favourite of the pupils?
4. How many pupils did note have breakfast?

- Divide the class into groups. Ask each group to discuss among themselves and decide on something that they think they could use to create a collection of data. Encourage pupils to be creative and use their imagination. For example, how many family members do they have, what is their favourite fruit, or colour or sports. Once they have collected their information by using tally marks, tell them to represent this information on a bar chart. Allow them to take help from the ***Example given on page 191 of New Countdown 4.*** Next call each group in front of the class to explain what data they collected and what is their findings.
- Provide A4 sheet to each pupil. Ask them to make a daily temperature chart. A sample is given below.

Days	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Temperature (°C)							

Ask the pupils to note daily temperature in the chart. After a week, guide them to represent the information on the same sheet by making bars.

Next call few pupils randomly in front of the class to explain their findings about the temperature during the whole week. Guide them to ask questions, such as 'identify the highest and the lowest temperature'

- Pupils have already learnt three types of graphs: bar graph, line graph, and pie chart. Ask following questions to improve their understanding using different type of graphs for different data.
    1. Which is the most appropriate type of graph to represent number of students liking different sports?
    2. Which type of graph should be chosen to show the proportion of people having a cat, dog, rabbit, or birds as their pet?
    3. Which type of graph would you select to record changes over a period? For example, growth of a plant in six months?

Exercise Commentary:

Exercise 8a focuses on interpreting bar graphs, column graphs, and line graphs while Exercise 8b is about interpreting pie charts. Pupils must read from the given graphs to answer the comprehension questions for each graph. Ensure they are answering comparison questions in full sentences and support each with reference to the data.

Math Lab Activity Handbook 4: Pages 57-59

Plenary:

Data interpenetration is important because it helps make decisions. This skill enhances logical thinking and critical analysis of data given in the form of line graph or bar graph. Bar and line graphs exhibit relationships between two or more values. Line graphs give a quick analysis of data. Bar graph summarises a big data to visualise them easily. Ask the students if they have ever seen or used graphs as a way of handling data in their daily lives. Where have they seen the graphs being used. How can they make information accessible and easier for everyone with graphs? Allow 5 minutes to the students to write a reflective essay on the importance of graphs.