MINISTRY OF EDUCATION & HUMAN RESOURCE DEVELOPMENT

COMMONWEALTH OF DOMINICA

CURRICULUM, MEASUREMENT AND EVALUATION UNIT

KS 2 MATHEMATICS GRADE 6

REVISED CURRICULUM GUIDE

Mathematics Curriculum Guide: Grade 6

Contents **page**

ACKNOWLEDGEMENTS
Developing curriculum material for our students to experience meaningful learning on the pursuit for mathematics education in school is a work that involves contribution by certain persons and institutions. While space will not allow for mentioning every contributor explicitly, one cannot avoid listing the following names.

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Due regard is also to be given to Leandra Laidlow, Learning Support Officer in the Ministry of Education, for reading the entire document and making useful remarks.

Simon Sharplis, Mathematics Education Officer

Introduction: Specific to Mathematics

Definition

The question as to what mathematics is arises when we seek to understand the bases/roots of our human activities. Mathematics can well be regarded as offering the foundation of many of our human activities. Mathematics deals with a collection of objects which includes points, lines, numbers and events all of which are basic notions in our thinking. The concern is not so much with the objects themselves as with the relationships and patterns they show.

The study of mathematics involves observing, discovering and investigating patterns and relationships especially as illustrated and modelled in the real world. To a significant number of us, one can well conclude in saying, "Mathematics is life."

Purpose of Mathematics for life in our world

It provides the capacity to

- Think in precise terms and hence to increase in knowledge
- Develop (process/problem solving) skills, that are needed for:
    - Making connections
    - Reasoning and proving
    - Communicating
    - Problem solving, which involves representing, selecting tools or technologies and computational strategies in critical thinking.

- Have confidence in building or interpreting quantitative descriptions

Contribution of Mathematics to the Curriculum

Mathematics provides a foundation for productive discourse especially in the sciences and to some extent in the humanities.

It offers fuel for:

- Creativity
- Originality
- Imagination

The Subject Strands:

- Number
- Geometry
- Measurement
- Statistics and data handling
- Patterns, functions and algebra

Integration

Across subjects

Mathematics concepts can be integrated into almost all other subjects of the national Curriculum and conversely mathematics can integrate concepts, skills and attitudes of other subjects. For example:

- Social Studies and HFLE: Social issues and trends that form the basis of life can provide the raw data needed for Statistics/Data Handling.
- In mathematics, students learn to estimate and make accurate measurements which are skills required to engage in learning experiences in Science. Measuring time is a life skill integrated into all subjects.
- Mathematics has its own vocabulary and mathematical literacy needs to be acquired in the early grades. This reinforces and consolidates the learning in Language Arts.
- Mathematics is about problem solving, mathematics contributes to the development of life skills and the holistic development of the learner.

Thematic Integration

It is possible to use a thematic approach to integrate across <u>and within</u> subject areas. For example, Nature provides opportunities for thematic integration not only <u>across</u> strands in mathematics but <u>across</u> other subjects.

Names of Units

It is to be noted that the idea that some teachers on the writing team had in mind when they brought names to the various units was that such names would suggest the sorts of objects and experiences that may be referred to in the lesson. Thus the name "On the Beach" could help to conjure up such objects as shells, coconuts, nets, waves, boats, corals, shorelines, etc. These objects could then be said to have a number, which students may then be invited to imagine. So if the shells collected on the first day of a two-day tour have their number to be 12345 and those gathered on the second day have their number to be 1357, the task might then be to find the sum of these numbers.

TERM 1 SUMMARY No. of	
UNITS	SESSIONS
UNIT 1: Number AT 1: LO 1 *Success Criteria*: 1 – 3 AT 1: LO 2 Success criteria: 1 – 7	2 weeks 2 weeks
UNIT 2: Geometry AT 2: LO 1 Success criteria: 1 – 2	1- 2 weeks
UNIT 3 Measurement: Length AT 3: LO 1 Success criteria: 1 – 3 **UNIT 4 Measurement: area** AT 3: LO 2 Success criteria: 1 – 3	1 week 1 – 2 weeks
UNIT 5 : Patterns AT 5: LO 1 Success criteria: 1 – 2	1 – 2 weeks

UNIT PLAN WITH SUGGESTED TEACHING, LEARNING & ASSESSMENT ACTIVITIES

TERM 1 STRAND 1 Number UNIT 1: Number

AT 1	**LO 1: Demonstrate an understanding of number up to seven digits** ***Success Criteria***

1. Read and write numbers up to 1 000 000 and represent them in a variety of ways.
2. Compare, order and arrange numbers, including one place decimals, in a variety of ways and create problems based on comparisons.
3. Use a calculator, pen and paper procedure or mental strategies to investigate number relationships.

ACTIVITIES

Read and write numbers up to 1 000 000 and represent them in a variety of ways

1.1 Students are engaged in activity using dice and card games. Begin with groups of four. Each child spins (rolls) the dice (a number of times) and writes their numbers.

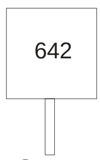
1.1.1 The numbers will be placed together.

1.1.2 Students will read and write the numbers formed.

NB: Activity could range from 4 digits to seven digits

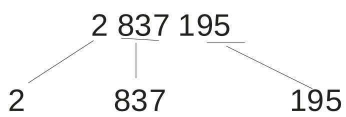
1.2 Students are related a story in which, while at, say, a cricket game, Sara Lee sees a number, possibly the number of runs now on the score board. She wants to write the number.

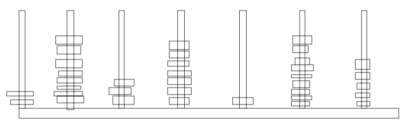
- Students use created ways (including number cards) to display that number, which they then read and write.

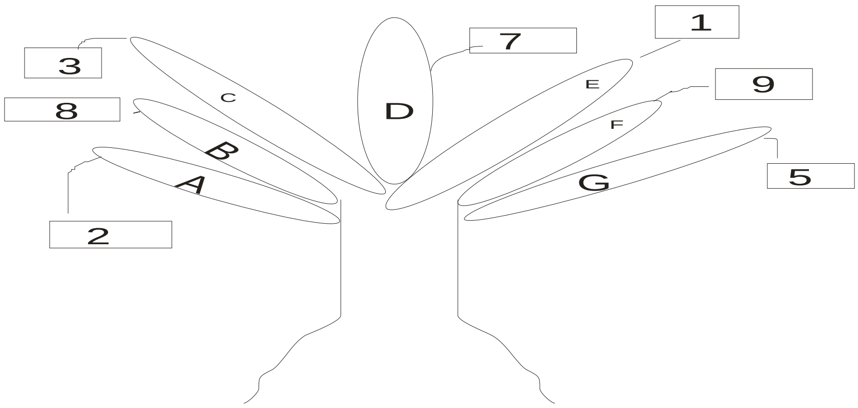


Score card

- Student are engaged in handling bigger cases, coming up with the following displays, say, when the assigned number is 2 837 195







Tree showing a Number

- NB: In the tree above, each of the loops A, B, C, etc can be regarded as a number. Other loops can be done and the number recorded using symbols and words.

1.3 Students are engaged in playing the game "Who's my partner" using number and word cards. Example: One student reads a number in words and other with the figures match what was read and vice versa.

1.4 Students read and write numbers using place value and expanded notation.

1.5 Students are led to appreciate that the number we want is the result revealed after a counting activity or after a calculation. To identify the number, we count a set. Once the number is identified, we may wish to use it in a calculation. The same number usually has different ways it is represented.

- Take 14, for example. Check that it has 2(3 + 4) as one of the ways it is represented. Check too that it has (2×3) + (2×4) as another of the ways it is represented.
- If a number has a(b + c) as one of the ways it is represented, does that number also have (a×b) + (a×c) as another way it is represented? To make a decision on this question, you could first check many examples. For example, you could check whether the number having 3(4 + 5) as a way it is represented also has 3×4 + 3×5 as another way it is represented. This search could lead you to discovery a certain rule in mathematics which can be used when doing calculation and which is called the distributive property of multiplication over addition. We say the reason we can write something like a(b + c) = (a×b) + (a×c) is that multiplication is

distributive over addition. (Question: Is multiplication also distributive over subtraction?)

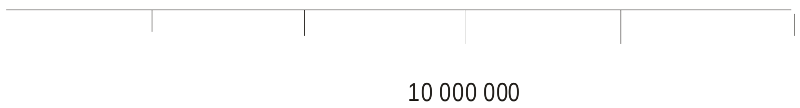
1.6 Students are told a story of a neighbour who, after an outing in which many parts in the Caribbean region were visited, came home and reported to have met many persons and explored large areas of land. Students observe as the following table is given (drawn) on the chalkboard and the information in it explained.

Territories in the region	population	Area (in square kilometres, km^2)
The Bahamas	309 456	13 939
Cuba	11 260 893	110 864
Haiti	8 376 542	27 753
Dominica Republic	8 754 321	48 442
Puerto Rico	3 965 742	8 959
Turks & Caicos	15 463	475
Cayman Islands	38 476	259
Jamaica	2 750 201	10 991
Trinidad	1 583 421	5 128
St. Kitts	41 254	262

- Students use the table to practice expressing the numbers in different ways. Example, they are asked, "Based on this table, what can we say about the persons living in Haiti?" They observe: "Their number is about 8 million or 8.4 million or eight million three hundred and seventy six thousand five hundred and forty-two."

- With help by teacher, students work out the following. Which city has a population of about:
  a. four million? _________
  b. 2.8 million? _______
  c. thirty eight thousand? _______
  d. eight thousand three hundred? _______
  e. eight thousand three hundreds? _____
  f. Which two countries total about 150 000 000 people together? ______

1.7 Students are presented with a number line as shown below and asked to place the population of A (Jamaica), B (Puerto Rico), C (Cuba) and D (Haiti) on the number line.



1.8 Students are given worksheets with the following problems/exercises and allowed to answer or complete. (These can also be written for students to complete.)

a. Students asked to say the names of the following numbers aloud: (i) 100 (ii) 101 (iii) 1 000 (iv) 10 000 (v) 100 000 (vi) 1 000 000 (Use can be made of a story in which someone started a trip with 1 000 dalmations (or shells) and by the end of the trip that number had increased to 1 000 000)

b. Students asked to write the following numbers in words: (i) 70 __________ (ii) 549 ____________ (iii) 2 600 _________ (iv) 25 000 ___________ (v) 60 000 ____________ (vi) 100 000 _____________ (vii) 150 000 __________ (viii) 400 000 ____________

c. Students asked to read the following numbers aloud (making reference to the places in the table): (i) 742 __________ (ii) 62 000 ______________ (iii) 99 999 ______________ (iv) 275 004 ______________ (v) 884 010 ____________

d. Students asked to write the following numbers in the short form: (i) Two thousand and eleven _________ (ii) six thousand and forty __________ (iii) twelve thousand and forty _________ (iv) eighty-four thousand and five _________ (v) nine hundred and fifty thousand ___________

e. Students asked to copy the following carefully and write them in the short form: (i) 800 + 60 + 1 is ________ (ii) 9 000 + 400 + 30 + 2 is _________ (iii) 3 000 + 20 + 4 is __________ (iv) 10 000 + 2 000 + 800 + 20 + 5 is _________ (v) 800 000 + 4 000 + 600 + 20 + 5 is _________

Compare, order and arrange numbers, including one place decimals, in a variety of ways and create problems based on comparisons

2.1 Students observe as the teacher makes use of the above table to generate another column.

Territories in the region	population	Area (in square kilometres, km^2)	Number of persons for every square kilometre
The Bahamas	309 456	13 939	22.2
Cuba	11 260 893	110 864	101.6
Haiti	8 376 542	27 753	301.8
Dominica Republic	8 754 321	48 442	180.7
Puerto Rico	3 965 742	8 959	442.8
Turks & Caicos	15 463	475	32.6
Cayman Islands	38 476	259	148.6
Jamaica	2 50 201	10 991	22.8
Trinidad	1 583 421	5 128	308.9

- Students use the result to make observations or inferences such as, "In the Turks & Caicos, we meet about 33 persons in every square kilometre."
- Students are posed questions, such as:
  - (i) In which territory do we meet the smallest number of persons in a square kilometre?
  - (ii) In which case do we meet the greatest number of persons in a square kilometre?
  - (iii) What is the difference between the population of the Dominican Republic and that of Haiti?
  - (iv) What is the sum of the populations of Haiti and Dominican Republic?

2.2 Students observe the numbers 22.2, 101.6, 301.8, 180.7, 442.8, 32.6, 148.6, 22.8, 308.9 and are allowed to put them in (a way to show the ascending) order. This could allow students to produce a result as illustrated below.

22.2 22.8 32.6 101.6 148.6 301.8 308.9 442.8 →

2.3 Students given strings of numbers that they are asked to arrange in order, from smallest to greatest. They observe and participate as the teacher walks them through the first example below and they proceed to complete the two others.

(i) 22 647, 6 684, 773 890, 32 557, 57 739
(ii) 7 902, 79002, 790, 790 002, 709 002
(iii) 57 809, 57 609, 50 909, 50 000, 50 709

Use a calculator, pen and paper procedure or mental strategies to investigate number patterns and relationships

3.1 Students are led to notice that these situations (stories) can be related: A number of teams enter a knock-out competition where there is no draws or replays. Students investigate the number of matches played for various numbers of teams. They build a table such as the following and use the table to produce the rule for the two numbers.

Number. of teams (x)	1	2	3	4	5	6	7
Number of matches (y)	0	1	2	3	4	5	6

3.2 At the end of every week, Nelissa reveals to a friend the money she has left in her account. In the first announcement, she mentions having 123. In the second announcement she mentions having 234. In the third announcement she mentions having 345. In the fourth announcement, she mentions having 456. In the fifth announcement, she mentions having 567. Students are informed that this means one has the sequence of numbers

123, 234, 345, 456, ___, ___

where the empty spaces means Nelissa has two more announcements to make. Students observe what is happening and use their observation to write the next two numbers.

3.3 Through stories similar to the one above, students are introduced to each of the following sequences and in each case allowed to work out what is happening and to reveal the next two terms.

A. 45, 43, 41, ___, ___
B. 24, 36, 48, ___, ___
C. 3, 6, 12, 24, ___, ___
D. 1, 4, 9, 16, ___, ___

RESOURCES

Stories, games, number cards, dice

ASSESSMENT

- Shown numbers up to 1 000 000 can read and write them in a variety of ways.
- Can order and arrange numbers in a variety of ways and create problems based on comparisons.
- Can use a calculator, pen and paper procedure or mental strategies to investigate number relationships.

AT 1	LO 2: Create and solve problems involving properties of numbers Success Criteria

1. Round off numbers with up to four digits to the nearest ten, hundred or thousand.
2. Find the place value of any number up to 7-digits.
3. Write 2, 3, 4, 5 or 6-digit numbers in expanded forms.
4. Play games and carry out investigations involving number concepts such as: odd, even, factor, multiple, composite and prime.
5. Create and solve problems involving number concepts.
6. Explain the strategies and procedures used in carrying out investigations and solving problems involving number concepts.
7. Search for solutions to problems using their own strategies and explain problems and processes.

ACTIVITIES

Round off numbers with up to four digits to the nearest ten, hundred or thousand

1.1 Students are given a situation where we often want to round off some number (use more zeroes close enough to the number), especially when it is good enough to give a sense of the number, rather than the number itself. They are led to appreciate, for example, that if the exact number of persons at a cricket game is 12 326, it might be good enough to report that about 12 000 persons were at the game. They are allowed to see that an advantage of reporting 12 000, rather than 12 326, is that it is easier to remember twelve thousand. They are led to suggest other examples when knowing what the number is about might be good enough.

1.1.1 In an extension activity students are engaged in comparing two reports of a cricket audience, possibly one of these claiming about 13 000 persons were at the game. Why is there more precision in the report that puts the figure at about 12 000?

1.2 Students are given some examples of what various numbers give when rounded off (i) to the nearest ten and (ii) to the nearest hundred. For example, they are led to see that:

- the number 234 gives 230 when rounded off to the nearest ten and 200 when rounded off to the nearest hundred
- the number 236 gives 240 when rounded off to the neatest ten and 200 when rounded off to the nearest hundred

- the number 254 gives 250 when rounded off to the nearest ten and 300 when rounded off to the nearest hundred
- the number 256 gives 260 when rounded off to the nearest ten and 300 when rounded off to the nearest hundred

NB: Students are given the examples that they may establish (find) the rule for rounding off.

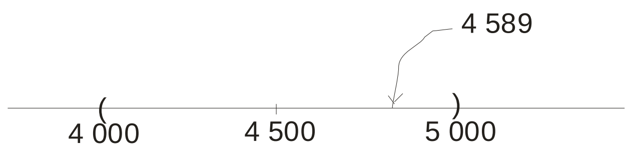
1.3 Students are given a situation where the number 234 is shown, for example, which could be the number of runs West Indies scored against Australia in a cricket encounter. Students are led (prompted, probed) to report this number gives 230 when rounded off to the nearest ten.

1.4 Students are related a story according to which in a search for some file (in your office), you have as many as 25 drawers open. Someone enters the room and says you cannot have so many open, that this number should be rounded off to the nearest ten. How many drawers must you close? This could be modified to use numbers associated with money.

1.5 Students are given a situation where a reporter sees the number 4 589 (in the number of tickets sold at the Windsor Park Stadium) and decides that the number he wants to appear in his (news) report is the result when this number is rounded off to the nearest thousand. Students are asked to explain how they would decide which number the reporter is looking for.

You observe that 4 589 is close to 4 thousand. But it is also close to 5 thousand. In other words, it comes between 4 000 and 5 000. Which is it closer to, 4 000 or 5 000?

Had it been exactly midway, it would have been 4 500. This means the situation is illustrated by the following picture.



In this picture we see that 4 589 lives in a neighbourhood whose boundaries are at 4 000 and 5 000. Notice too that it lives in the upper part of this neighbourhood. It is this piece of information that tells us when it is rounded off to the nearest thousand, we get 5 000.

Find the place value of any number up to 7-digits

2.1 Students are engaged in investigation of one, two, three digit numbers to illustrate place value use (expanded notation in words)

2.2 Students are asked to imagine that on a certain occasion ten countries go to war. Before the war is entered, a count is taken of the soldiers in each country's army. The result is the following.

(1) 6**6**29 (2) **3**00012 (3) 90**8**70 (4) 8**2**1450 (5) 8804**5**0
(6) 5**6**487 (7) 642**9**0 (8) 264**9** (9) 7**5** (10) **1**3368

Students reveal the place value of each bold digit.

2.3 Students practice separating numbers using a table as shown.

Millions	Hundred thousands	Tens thousands	Thousands	Hundreds	Tens	Ones
5	4	2	3	6	7	9

2.4 Students are given number cards. They are directed to stand "horizontally" at the front of the class. They are pointed to "Hot Spot" (a targeted digit in a specific area). Students in the Hot Spots give the place value of their digits.

2.5 Students are given number cards. They are led in a competition in which teacher calls out specific numbers which students will display then use the place value chart to show the correct position of each digit.

Write 2, 3, 4, 5 or 6-digit numbers in expanded forms

3.1 Students are related a story in which John sees a fish displaying a number. (Use two, three, four digits.) The number is 54 324. Students are questioned and led to write the number as 50 000 + 4 000 + 300 + 20 + 4. They are engaged in writing in this form other numbers that John's fish might display.

3.2 Students are engaged in matching number cards with expanded form: example

9 876 = 9 000 + 800 + 70 + 6

3.3 Students are posed question: Can the number 62 986 be written as (6x10 000) + (1x 1000) + (9x100) + (8x10) + (6x1)? Students are engaged in discussing if this is an acceptable form. Why or why not.

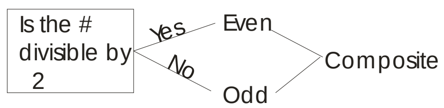
3.4 Students are shown number in expanded form and are allowed to rewrite it. Example, for (5x 10 000) + (4x 1 000) + (3x100) + (2x10) + (6x1), students write 54 326.

Play games and carry out investigations involving number concepts such as: even, odd, factor, multiple, composite and prime

4.1 Students construct a hundred chart. They use examples of different types of numbers to guide them in developing a number pattern. Example: 2, 3, 5, 7 (prime) by circling or enclosing different numbers on their hundred square table

4.2 Students use patterns identified to group numbers. Example: odd, even, prime, etc.

4.3 Students are involved in playing the game "who knows my number." A student moves to the front of the class with a number card. Class questions the student to determine the number, asking such questions as: Is the number divisible by 2? Does the number have more than two factors?



Create and solve problems involving number concepts

5.1 It is given that in a game or a "stream" the objects are pairs of numbers. Students are asked to come up with cases in which such number pairs have a constant difference. Students note that if the difference is 10, a possible "stream" would be (0, 10), (1, 11), (2, 12), (3, 13), ….

5.1.1 Students are questioned to note that this is a result that can be put in a general way. For if the first number is x and the second y, we have the equation: the second number – the first number equals 10. In other words, for numbers (x, y), we have the equation y – x = 10

5.1.2 Students are invited to use this example to generate other such "streams" and then to seek to show how to put the stream in a general way.

5.2 Students are led to think of a stream in which the objects are pairs of numbers where the second entry (the y) is obtained by first multiplying the first entry by 2 and then adding 1. Students are probed to report that the stream involves the equation $y = 2x + 1$. They are questioned to conclude that some things in this stream are (0, 0), (1, 3), (2, 5), (3, 7), (4, 9)

Explain the strategies and procedures used in carrying out investigations and solving problems involving number concepts

6.1 Students are first engaged in coming up with a list of such strategies (using word problems). For every strategy in the list, students in groups come up with an explanation that makes use of examples of problems that may well be solved using the named strategy.

6.2 Students are engaged in explaining the relative merits when use is made of a table, a graph, a formula, a pattern to come with the solution to a problem.

Search for solutions to problems using their own strategies and explain problems and processes

7.1 Students are afforded problems which they may be engaged in solving by some method such as drawing a picture or table, working backward, guess and check, using a formula, looking for a pattern or a combination of such strategies.

7.2 Students in groups are allowed to search for problems which are then given to other groups to solve using various strategies that students are allowed to explain.

RESOURCES

Place value chart, number cards, activity cards, hundred square chart

ASSESSMENT

- Shown a table such as the one below, can complete.

Number	Number name
215 842	
	Four million, three hundred and ninety-two thousand and seven
700 358	
	Nine thousand, six hundred and fifty-eight
528 045	

- Shown numbers with underlined digits, can say (write) the value of the underlined digits. In each of the following cases, for example, can write the value of the underlined digits:

  (a) 7 6<u>5</u>1 (b) <u>5</u>17 846 (c) <u>1</u> 949 601 (d) 2 000 <u>3</u>94

- Shown a list of numbers in which some does not meet a specified condition (e.g. is not prime), can say which of the numbers

  I am on a math mission with prime numbers only. Which of these numbers would not be packed in my bag?

71, 86, 13, 22, 7, 23, 9, 15, 29, 37

- Shown a list of operations and digits, can select from the list and build a certain type of number

  Use any operation (+, -, ÷, ×) and the digits of the number in brackets (2 3 8 4 7) to build two of each number type below. Even, odd, prime, composite.

TERM 1 STRAND 2 *Geometry* UNIT 2: *Geometry*

AT 2	LO 1: Apply understanding of 3-D shapes to construct models. ***Success Criteria***

1. Draw and make nets of the cube, the cuboid and the cylinder.
2. Make models of the cube, the cuboid, the cone and the cylinder using their nets.

ACTIVITIES

Draw and make nets of the cube, the cuboid and the cylinder

1.1 Students are related a story in which Jesse and her friend Josh are in an exchange about things they wish to find, or things that concern them. To Josh, Jesse says, "Some of the nice things we can find are solids."

- While interacting with and making reference to suitable examples shown in the classroom, students are engaged in a discussion on what we mean by solids. They are led to say that to be a solid an object must have length, breath and height. (It may be useful to emphasize that objects are not solids if they are flat, that is, if they are in that neighbourhood of mathematics called the plane.)
- Students explore the school environment and identify objects that are (i) like the cube, (ii) like the cuboid and (iii) like the cylinder (that is, things that are cylindrical).

1.2 Students are each given a small box and asked to break up the top (e.g. inside part of a match box) and lay flat. The object is drawn.

1.3 Students are engaged in using paper to draw and make nets of solids, including, possibly, that of pyramids and prisms. Students are questioned to appreciate that the nets are all flat. They are in the plane. (The paper used is imagined to have no thickness, so that the net has no height.)

1.4 Students are engaged in carrying out research on 3-D shapes (encyclopedia, internet, math resource books) and are allowed to share their findings, mentioning such things as that the square-based pyramid is also called the tetrahedron.

Make models of the cube, the cuboid, the cone and the cylinder using their nets

2.1 Students are engaged in making models of the cube, of the cone and of the cylinder using nets made in a previous exercise.

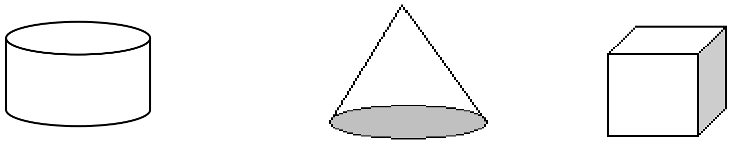
2.2 Students are led to talk of the result, the model, noting that it is no longer in the plane. It is in that neighbourhood referred to in mathematics as three-dimensional space (or space of three dimensions). So in making the model, we have transformed the object, the net. We have removed it from the plane and situate it in 3-D space.

RESOURCES

Models of 3-D shapes, charts, chart paper, ruler

ASSESSMENT

- Shown items that together form a net, can indicate what solid shape can be made using them.
- Shown a model of a 3-D object, can indicate the faces, the edges, the vertices.
- Shown some 3-D shapes, can draw their nets



TERM 1 STRAND 3 Measurement UNIT 3: Measurement – Length

AT 3	**LO 1 length: Create and solve problems using standard units of length** ***Success Criteria***

1. Explain the concept and use of the kilometre in real life situations.
2. Estimate and describe distances using the kilometre as the unit of measure.
3. Create and solve real life problems involving cm, m and km.

ACTIVITIES

Explain the concept and use of the kilometre in real life situations

1.1 Students are given real life situation e.g. Sabrina has a piece of string. She wants to help her friends Dina, Jamal and Rashida to know its length.
- Students are questioned to get into saying to do this Sabrina must use an *instrument*.
- Students are now allowed to have some instrument(s) in their sight so that their eyes are on the instrument(s).
- Students are questioned to note that the instrument is *calibrated* ("marked with a standard scale of readings").
- Students are reminded that
    - different instruments are not necessarily calibrated in the same system,
    - in the case of the metric system, the calibration is done based on a unit called the metre. A thousand of this base unit together gives a kilometre ('Kilo' means thousand)

1.2 Students are led to talk about instances (e.g. when on a drive or a belle maché or outing) when some length or distance might concern them, and lengths or distances they may wish to measure. These include the length of an island's coast, or the distance between two points (possibly two points on the same planet, or possibly a point on Earth and another on Pluto).
- Students are engaged in measuring lengths and distances, in some (reasonable) unit of their choice. They then use a table of keys to convert to the kilometre.

1.3 Students are led on a walk that is exactly 1 km (one way). Students use the experience to suggest their estimations for various distances. Their estimations are then compared with values from a chart.

Estimate and describe distances using the kilometre as the unit of measure

2.1 Students are given a situation where Sue knows the distance between Roseau and Portsmouth is 30 miles. She wants to find this same distance in Km. In an effort to get help, she goes to Carol, who says she must use the rule (or expression saying) that

$$1\text{km} = \frac{5}{8} \text{ Mile}$$

- Students are engaged to notice that this rule is saying when we change to km, the number should be bigger, because you are taking the same distance and cutting it into smaller units, say, the same rod and cutting it into mm instead of cm.
- Students are led to see that to do the change, Sue must multiply 30 by 8 and then divide by 5. The result is 48 km. In her final report, Sue says the distance between Roseau and Portsmouth is about 48 km.

2.2 Students are related a story in which Vic and Patsy are in an exchange about whether the distance between two points can change. In the story Mr and Mrs Mathematics measure the distance between Roseau and Portsmouth or between any two points on Dominica's surface. They did so when they heard that (for some reason) there was going to be a drop in the temperature, so that islands in the Caribbean region would be expected to be much colder. Once the predicted drop comes, Mr and Mrs mathematics again measure the distance between the two points. They get a different reading, one which suggests that the surface shrank a bit.
- Students are afforded a map (involving a suitable scale) and allowed to work out various distances in kilometres
- Students are given distances or lengths in miles and allowed to convert to kilometres.

Create and solve real life problems involving cm, m and km

Here are possibilities of such experiences:

3.1 In a kite-flying competition, Jamie managed to get her kite to fly a distance recorded as 970 m, while Ellen got hers to fly a distance recorded as 96 900 cm. Students are asked to say which kite travelled the greater distance.

3.2 Three boys – Keith, Dan and Cody – are challenged to show which of them can run the greatest distance in quarter of an hour. The results were recorded as follows: Keith: 1.2 km; Dan: 1205 m; Cody: 120 510 cm. Students are asked to determine which of the three competitors took the price for that race.

3.3 Students in groups are engaged in measuring their heights in cm before converting to metres. They are guided in using the classroom wall to first mark off their heights and then using metre rule or tape to get the measurement.

3.4 Students are allowed to go out in the school yard to measure: (a) the length of the corridor; (b) distance from one classroom door to the next; (c) length of the netball court (if they have one); (d) other distances selected by the teacher according to the layout of the school.

RESOURCES

String, rulers, metre rule, tape measure

ASSESSMENT

- Can explain the concept and use of the kilometre in real life situations.
- Can estimate and describe distances using the kilometre as the unit of measure.
- Can create and solve real life problems involving cm, m and km.

TERM 1 STRAND 3 Measurement UNIT 4: Measurement – area

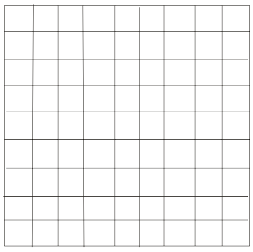
AT 3	LO 2 Area: Solve simple real life problems involving area Success Criteria

1. Find the area of irregular shapes by counting squares.
2. Calculate the area of composite shapes involving rectangles.
3. Create and solve real life problems involving area.

ACTIVITIES

Find the area of irregular shapes by counting squares

1.1 Students are each afforded a sheet of paper with a grid (that is, graph paper to investigate area) as illustrated below, and an explanation of the paper.



i. Students are asked to
   a. shade one square.
   b. Shading refer to area
   c. Then unit is 1 cm square, that is, 1 cm^2
ii. Students are asked to draw a closed figure on the surface that they are given.
iii. Students are asked to remark on the submission that their shape has an area. They are questioned to recall what we mean by area.
iv. Students are led to conclude that their shape is enclosing an amount of surface (or 2-D space) and that its area is the amount of surface it encloses.

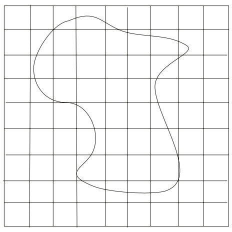
1.2 Kate has an irregular shape whose area she wants to find. Students are offered that to find the area Kate takes some steps:
i. She **imagines** that the entire surface is divided into small squares of the same size. (E.g. 1cm by 1cm squares or 1 m by 1m squares or 1 km by 1km squares. Include 1 m^2 and 1 km^2)
ii. She counts such squares to find their number. In taking her count, she
   a) ignores any piece that is clearly less than half a unit
   b) takes as half a unit any piece that is about so

c) regards as a whole unit any piece that is more than half

iii. She says the area is the number of unit squares.

Students are given examples of irregular shapes drawn on graph paper and asked to find their areas. They are allowed to realise that the result obtained using this method is an estimation, not a very precise value.

1.3 Mr. Joe wants to tile a floor whose irregular shape is as suggested below and where each square unit is a tile which is 30 cm by 30 cm.



i. Students are asked to estimate in square metres the area of the floor and hence the number of tiles that Mr. Joe should buy.

ii. Students estimate the number of tiles that Mr. Joe may have wasted if he bought 40 tiles.

1.4 Students count squares to find various areas.

Calculate the area of composite shapes involving rectangles

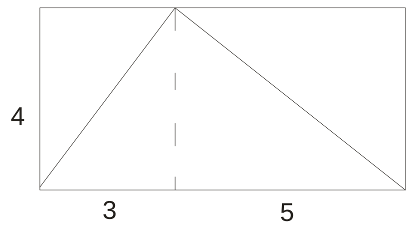
2.1 On graph paper students draw various rectangles and squares. They count the squares and tabulate the areas.

2.2 Students are led to appreciate or establish that to find area we can also make use of a formula. Students proceed to say what the formula is if the surface is a square or a rectangle. Let the length be l and the width, w. Then the area is lw. Otherwise said, we have A = lw

2.3 Students are engaged in making use of the formula to calculate areas of various composite shapes.

Create and solve real life problems involving area

3.1 Students read and discuss word problems related to area. June has a rectangular-shaped piece of cloth, which is (3 + 5) by 4 square units, or 8 by 4 square units, or 32 square units, as shown. Can she use this piece of information to find the area of the triangle whose base is 3 + 5 units or 8 units?



3.2 Students complete the solution to area-related problems. (A kitchen floor has the shape of a rectangle and a triangle. If the area of the rectangle is 8 cm^2 and the triangle has a height of 5 cm, what is the area of the whole kitchen floor?)

3.3 Students solve word problems individually.

RESOURCES

Geometry set, manila paper, charts, markers, crayons

ASSESSMENT

- Shown some irregular shapes, can determine their areas by counting squares.
- Shown some composite shapes involving rectangles, can find their areas using the formula A = lw.
- Shown shapes involving rectangles, can reason to calculate the area of related triangle.

TERM 1 STRAND 5 Patterns, Functions & Algebra UNIT 5: Patterns

AT 5	LO 1: Show and apply number relationships using a variety of different methods *Success Criteria*

1. Plot points on a co-ordinate grid using information from table.
2. Generate some inputs and outputs using a given rule e.g. 'double', 'add one' etc. and plot these on a co-ordinate grid.

ACTIVITIES

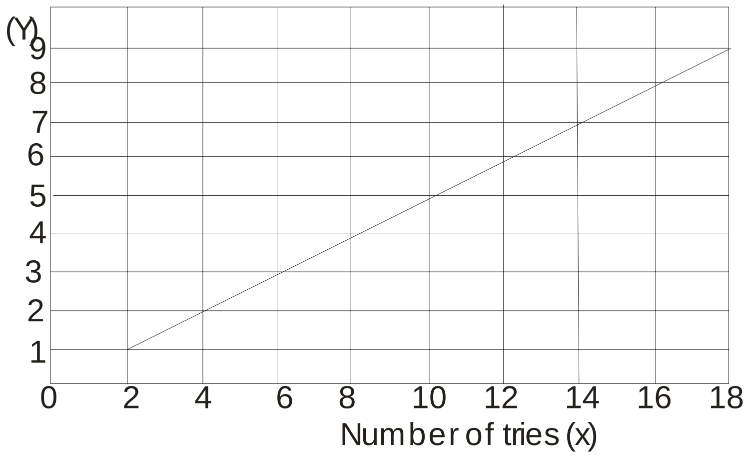
Plot points on a co-ordinate grid using information from table

1.1 Students are shown a graph of number of football games and goals scored and asked to answer question, then make table.

1.2 Students are related a story according to which Dinah was practising getting the basketball into the basket. She recorded her results in a table as shown below.

Number of tries (x)	2	4	6	8	10				
Number of baskets made (y)	1	2	3	4	5				

- Students are questioned to suggest what they must assume to complete the table. They are led to suggest that throughout the exercise the same pattern is maintained.
- Students are led to complete the table
- Students are prompted to say the table can be represented as a graph and are guided to see how this is done.
- Students are led to see that to come up with the graph we need (i) two lines, one for the number of tries and the other for the number of baskets; (ii) the two lines to cross each other at right angle; (iii) to think of each pair in the table as a single point on the graph.
- Students are afforded a grid or graph paper and guided to come up with a graph as exemplified below.



1.3 Students are told a story in which one finds the following table.

Number of burgers	2	4	6	8	10				
Cost/$	1	2	3	4	5				

- They are led to complete the table, to see that the table gives information that can be presented as a graph.
- They are guided to draw the graph.
- Students are led to (i) notice that to each number of burgers, there is a unique (that is, exactly one) cost, (ii) work out that, for example, the cost for 2 burgers is 1 dollar, the cost for 4 burgers is 2 dollars. (iii) Students use the graph to find the cost for (a) 3 burgers, (b) 5 burgers, (c) 7 burgers.

1.4 Students are given a situation in which someone enters a room in which are chairs and watch as the number of chairs increases. Students simulate the exercise. First they bring one chair into a particular part of the classroom. They take a count of the number of legs and fill out the table below.

Number of chairs	1	2	3	4	5	6	7	8	9	10
Number of legs	4									

- Another chair is brought and a count is taken. Again the information is noted in the table. The procedure continues until the table is complete.

- Students are led to see that the table gives information that can be presented as a graph. They are guided to draw the graph (of number of tables against number of legs), as shown.

Generate some inputs and outputs using a given rule e.g. 'double', 'add one' etc. and plot these on a co-ordinate grid

2.1 Students are related a story in which, in looking for "nice things out there," some friends ended up in an area where some ants were. In looking at the ants, one of the friends noticed that the ants never seemed to harm one another as they continued in their activities. And the friends wondered why. Students are asked to suggest why. They are led to suggest that the ants might be following or obeying some law or rule, possibly a law which states, "always help and never hurt." Students:

- o Discuss where rules or laws are found
- o identify examples of rules that mathematics gives for numbers to follow.

2.2 Students are led to construct a table for burgers (x) and cost (y).

Burgers (x)	1	2	3	4	5	⊗
Cost (y)	5	10	15	□	∆	30

2.2.1 What rule connects y and x? Students may be prompted to respond that $y = 5x$

2.2.2 Students report what the cost must be if the number of burgers is (i) 20 (ii) 40 (iii) 60 (iv) 80 (v) 100. Similarly, they work out what the number of burgers must be if the cost is (i) 35 dollars (iv) 45 dollars (v) 60 dollars.

2.3 A number of teams enter a knock-out competition where there is no draws or replays. Students investigate the number of matches played for various numbers of teams. They build a table such as the following and use the table to produce the rule for the two numbers.

Number. of teams (x)	1	2	3	4	5	6	7
Number of matches (y)	0	1	2	3	4	5	6

2.4 David has the temperature in degree Celsius (°C). He wants to get it into degree Fahrenheit (°F). The rule he must use says the Celsius temperature must first be multiplied by 9/5 and then the next step is adding 32 to the product obtained from the multiplication. If x is the temperature David has and y, the temperature he wants, the rule says:

$$Y = \frac{9}{5}x + 32$$

Students use this to make or complete a table

Temperature in °C (x)	0	10	20	30	40	50	60	70	80
Temperature in °F (y)									

Example of use of the formula: When we have 10 for x, what is y?
Solution: 10 for x means, for y, we have

$$\frac{9 \times 10}{5} + 32$$

$$\text{Or} \quad \frac{9 \times \overset{2}{\cancel{10}}}{\underset{1}{\cancel{5}}} + 32$$

$$\text{Or} \quad 18 + 32$$

$$\text{Or} \quad 50$$

RESOURCES

Story, graph paper, formula

ASSESSMENT

- Given information in a table, can use it to plot points on a co-ordinate grid.
- Given a given rule e.g. 'double', 'add one' etc., can use it to generate inputs and outputs and plot these on a co-ordinate grid.

TERM 2 SUMMARY No. of	
UNITS	**SESSIONS**
UNIT 1: Number *AT 1: LO 3* *Success Criteria*: 1 – 7	4 weeks
UNIT 2: Geometry AT 2: LO 2 Success criteria: 1 – 4	2 weeks
UNIT 3: Measurement – Volume AT 3: LO 3 Success criteria: 1 – 3 **UNIT 4: Measurement – mass** AT 3: LO 4 Success criteria: 1 – 3	1 week 1 week
UNIT 5: Statistics AT 4: LO 1 Success criteria: 1 – 4	2 weeks

UNIT PLAN WITH SUGGESTED TEACHING, LEARNING & ASSESSMENT ACTIVITIES

TERM 2 STRAND 1 Number UNIT 1: Number

AT 1	**LO 3: Create and solve real life problems involving addition and subtraction with numbers up to 100 000 and involving multiplication and division of up to 3-digit numbers** ***Success Criteria***

1. Explain and use several strategies to recall the basic facts for addition and subtraction.
2. Create and solve real life problems involving addition and subtraction of whole numbers with totals up to 1 00 000.
3. Use a variety of strategies to recall multiplication and division basic facts.
4. Discuss and use a variety of strategies to solve problems involving multiplication of 2-digit by up to 2-digit numbers and division of up to 3-digit numbers by 1 digit numbers in real life settings.
5. Explain and use mental computations, calculator or pencil and paper strategies to carry out calculations when necessary.
6. Estimate the answer to a computation.
7. Determine the reasonableness of an estimated or exact answer to a computation and justify their conclusion.

ACTIVITIES

Explain and use several strategies to recall the basic facts for addition and subtraction

1.1 Students are asked to think of a number, between 1 and 50. Once students write down their respective numbers, they are asked what the result is of their number plus 0. (Write students' responses to help students generate rule.) In the ensuing discussion, students are questioned about the **addition of 0**. Cases cited may include 1 + 0, 2 + 0, 3 + 0, …, 50 + 0. Students are led to the rule which says if x is any number, x + 0 = x. A number remains the same when 0 is added.

1.2 Students are asked to think of a number, between 50 and 100. Once students write down their respective numbers, they are asked what is that number minus 0. (Allow students to tabulate result and generate rule.) In the ensuing discussion, they are questioned about the case in which the number subtracted from the given number is 0. Cases cited may include 1 – 0, 2 – 0, 3 – 0, …, 100 – 0. Students are led into saying the rule x – 0 = x. A number remains the same when 0 is subtracted.

1.3 Students are questioned to use the **"near doubles" strategy** (e.g. near 10 or near 100 strategy). If Sara is asked, "What is 25 + 27?" she fishes out of her toolbox a contraption often referred to as the near double strategy. With it she rewrites 25 + 27 as 25 + 25 + 2. This **representation** is then rewritten as 50 + 2. And then Sara says, "Oh, 52." This can be applied to the expression 30 + 27 to get 30 + 30 – 3 or 60 – 3, which is 57. Students are engaged in working out examples using the near doubles strategy.

1.4 Students are questioned to use the **split strategy**. If Mark is asked, "What is 507 + 52," he fishes out of his toolbox a technique often referred to as the split strategy. With it he rewrites 506 + 53 as 500 + 50 + 6 + 3. This representation is then rewritten as 550 + 9, which is 559. Students are engaged in calculating examples using the split strategy.

1.5 Students are questioned to use the **compensation strategy** to work out what happens when, say, 38 is added to 42. They are led through a procedure as illustrated below.

```
38 + 42 = 38 + 40 + 2
        = 78 + 2
        = 80

53 + 39 = 53 + 40 - 1
        = 93 - 1
        = 92
```

```
65 - 28:  65 - 30 = 35
          35 + 2 = 37

60 - 41:  60 - 40 = 20
          20 - 1 = 19
```

Students proceed to use the compensation strategy to deal with cases such as

I. (a) 27 + 41, (b) 45 + 29, (c) 83 + 38, (d) 57 + 42, (e) 56 + 39, (f) 68 + 49

II. (a) 43 – 19, (b) 85 – 31, (c) 54 – 22, (d) 79 – 18, (e) 72 – 28, (f) 37 – 19

1.6 Students use "**jump strategy"** to reveal what happens when, say, 53 is added to 38.

Jump strategy
53 + 38
53 + 30 = 83
83 + 8 = 91
54 - 37
54 - 30 = 24
24 - 7 = 17

Students proceed to use the jump strategy to deal with cases such as the following

III. a. 46 + 38, b. 72 + 27, c. 39 + 55, d. 23 + 69, e. 68 + 64, f. 19 + 77, g. 57 + 83, h. 84 + 97

IV. a. 29 – 18, b. 36 – 17, c. 54 – 25, d. 71 – 46, e. 66 – 39, f. 87 – 55, g. 90 - 34, h. 45 – 23

Create and solve real life problems involving addition and subtraction of whole numbers with totals up to 1 000 000

2.1 A bank allows Mr. Felix to enter an arrangement where he gets a sum of money A and at the end has to pay the bank a sum of money B. Students find the difference for various cases of A and B, example, when A is $890 321 and B, $980 000.

2.2 On a certain occasion 12 345 attended a political meeting. Of that number, 2 098 were wearing green t-shirts. Of the remaining number, there were twice as many wearing red t-shirts as blue t-shirts. How many persons wearing each colour were there?

2.3 An earthquake added 501 metres of shoreline to an island's shoreline. Then, another tremor removed 109 metres. This made the shoreline 1 000 000 metres. How long was the shoreline before these quakes began changing it?

2.4 Students are related a story in which 7 teams enter for a knock-out competition. They are asked to find the number of matches that will have to be played if there are no draws or replays. (Answer:6. This results from 3 matches in the first round, 2 in the second round and 1 in the last round.)

Use a variety of strategies to recall multiplication and division basic facts

3.1 Students are asked to think of a number, possibly that of the mangoes on a branch or the fish in a net or the letters on a book's third page or the characters in a story. Students then write down the number, which may be 780. Students are asked to imagine that someone wants to remove (subtract) 12 from this number and continue to subtract 12 until what is left is 0. (For example, you are removing 12 mangoes from that branch until the mangoes are all taken away, the number now on the branch being 0. Students are then asked to count the number of groups of 12, the quotient.) Students are reminded that to say this we write the expression 780 ÷ 12.

- Students are led to see that if we let 780 and 12 be engaged in division in this way, the result is the same when 130 and 2 are engaged in division in a similar way. Students are led to discuss the following statement, focussing on how to arrive at it.

$$\frac{780}{12} = \frac{130}{2}$$

- Students are allowed to see that this is saying the expressions 780 ÷ 12 and 130 ÷ 2 come to the same thing, the same answer (no. of groups). Students are allowed to show that the answer is 65.

3.2 Students are given division problems to investigate. They develop their own method of calculating the answers. Eg. 732 ÷ 12 = 61. Show how you would arrive at this answer. (Dividend / Divisor = Quotient)

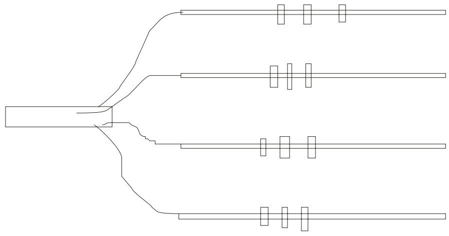
3.3 Students study steps involved in dividing three and four digit numbers on the board (by single digit divisors and double digit divisors).

- Suggestion:
    a) Divide the first digit by the divisor. If it is not possible, place a zero over that digit.
    b) Now divide the first two digits by the divisor. If it is possible, write the number of times the divisor will go into the two digits over the second digit.
    c) Continue dividing until you get to the last digit of the number.

786 ÷ 5, 786 ÷ 6, 786 ÷ 7, 786 ÷ 9, 786 ÷ 10, 786 ÷ 12

Discuss and use a variety of strategies to solve problems involving multiplication of 2-digit by up to 2-digit numbers and division of up to 3-digit numbers by 1-digit numbers in real life settings

4.1 Students are related a story in which a river branches out so that in each of its four branches there are 3 streams. Students discuss how to find the number of streams in the branches. They come up with a picture or illustration as shown.



- Students are led to write the expression 4×3 if each branch has 3 streams
- Students are led to write the expression 4×30 if each branch has 30 streams
- Students are led to write the expression 4×300 if each branch has 300 streams.

4.1.1 The above could be modified to have a case where on each hand there are 5 fingers, or a case where each window has 9 panes, etc.

4.2 A bunch of bananas has 6 hands. Each hand has 12 bananas. Students discuss how to find the number of bananas.

4.3 Kerry has 18 coins – two-cent and five-cent pieces – in his pocket. There are three times as many five-cent pieces. Students discuss a strategy that they can use to find how many of each coin Kerry has. They are led to use guess and check as a strategy.

4.4 Dior thinks of a number. When it is multiplied by 2 and then 3 is added, the result is 11. Students discuss how to find the number that Dior has in mind. They are led to use the strategy called working backward. They also discuss whether use could be made of a formula (an equation) to work out the answer.

4.5 Students in small groups are afforded word problems involving multiplication or division (or both). Students study and the problems and discuss how to solve them. Students in groups proceed to solve the problems and to share with the rest of the class on the strategies they used to arrive at the solution.

Explain and use mental computations, calculator or pencil and paper strategies to carry out calculations when necessary

5.1 Students are engaged in mentally calculating teacher-posed computation questions at the beginning of each mathematics lesson.

5.2 Students are given a situation in which two or more numbers (taken from the set of cards marked 0 – 9) are delivered (or inputted) into a calculator or a mind. A desired result, an answer is calculated. The cards are shuffled. Students are dealt two cards. They record the two numbers that can be made using these digits. For example, if the cards that a student is dealt are as illustrated below, the student records 51 and 15.

1		5

- Students record the difference between the numbers
- Students discuss strategy or strategies that can be used to do this mentally

Estimate the answer to a computation

6.1 Students are presented with a scenario. They are asked to imagine that at the end of a battle as many as 12 345 persons came to receive medals. Each individual received 2 medals. Students are asked to explain why the number of medals distributed at that point was closer to 24 000 than either 20 000 or 26 000.

6.2 If you wish to estimate the answer to, say, 3.5×7.1 (the multiplication of 7.1 by 3.5), you can work with the expression 4×7. This move allows you to see that the answer must be close to 28.

6.3 Students are given leads to help them estimate the answer to simple division problems. Example: If $300 \div 10 = 30$, what might $300 \div 5$ be equal to? (Half of 30 or twice 30?)

6.4 Students work in pairs to estimate answers to division problems. Example: If $600 \div 100 = 6$, then $600 \div 50 =$ ___

Determine the reasonableness of an estimated or exact answer to a computation and justify the conclusion

7.1 Joan is doing an estimation. For 1 234×56 she gives 600 000 (six hundred thousand) as an estimation. Students are asked to look at the numbers and explain how to see that in her estimation Joan is unreasonable.

- As a first step, students note that the answer is close to 1 000×60
- This helps one to see that the answer must be close to 60 000, and not 600 000

7.2 Chad is doing an experiment to find the power in a circuit when he knows the formula to use is P = VI, where P is power, V is the reading made using an instrument called a voltmeter and I, the reading made using an instrument called an ammeter. In a particular case, Chad recorded 2.4 for V and 3.4 for I. This Chad took to mean that the power is 8.16. Students are asked to suggest if it is reasonable to say the answer is 8.16

- Students are led to appreciate that the answer cannot reasonably be more precise than the less precise figure in a computation, that it would have been more reasonable if Chad wrote 8.2 for the power, or even 8.

RESOURCES

Charts, activity sheets

ASSESSMENT

- Can explain and use several strategies to recall the basic facts for addition and subtraction.
- Can Create and solve real life problems involving addition and subtraction of whole numbers with totals up to 1 00 000.
- Can use a variety of strategies to recall multiplication and division basic facts.
- Discuss and use a variety of strategies to solve problems involving multiplication of 2-digit by up to 2-digit numbers and division of up to 3-digit numbers by 1 digit numbers in real life settings.
- Can explain and use mental computations, calculator or pencil and paper strategies to carry out calculations when necessary.
- Can estimate the answer to a computation.
- Can determine the reasonableness of an estimated or exact answer to a computation and justify their conclusion.

TERM 2 STRAND 2 *Geometry* UNIT 2: *Geometry*

AT 2	LO 2: Create and solve simple problems with 2-D shapes ***Success Criteria***

1. Classify 2-D shapes in a variety of ways.
2. Draw 2-D shapes according to simple directions.
3. Select and use their own criteria to classify 2-D shapes.
4. Solve simple problems involving properties of 2-D shapes.

ACTIVITIES

Classify 2-D shapes in a variety of ways

1.1 Students can (i) stay in or (ii) go outside of the class room and observe shapes in the environment.

1.2 Students are related a story in which Dior meets Jason and wants to know what he has been up to. Jason says he has been looking in the plane for some things, shapes, which he could use.
- Students are engaged in presenting possible shapes that Jason found.
- Students classify such shapes using terms such as three-sided, four-sided, five-sided, six-sided, seven-sided, eight-sided, nine-sided, ten-sided.
- Students are then engaged in coming up with the names for each of these cases (triangle, quadrilateral, pentagon, hexagon, heptagon, octagon, nonagon, decagon).
- Students talk about the circle in the plane. They remark on someone's comment that the circle is beautiful.

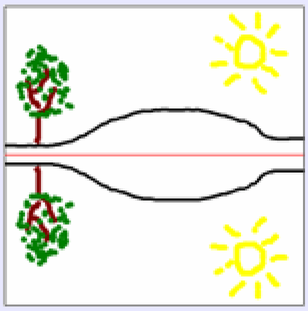
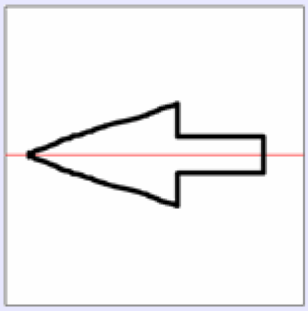
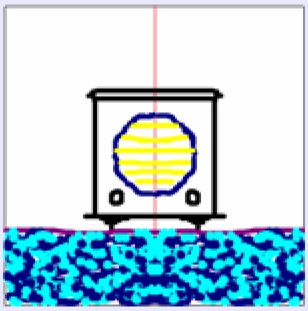
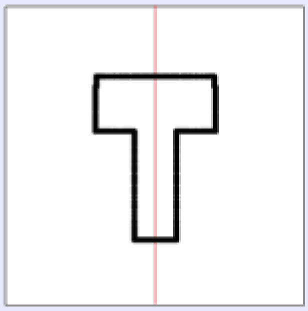
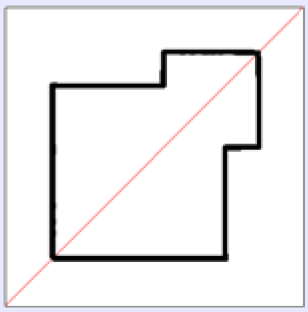
1.3 Students are led to appreciate that shapes in the plane are with angles. Students talk about and identify angles in regular polygons. Students investigate the shape to identify angle properties.

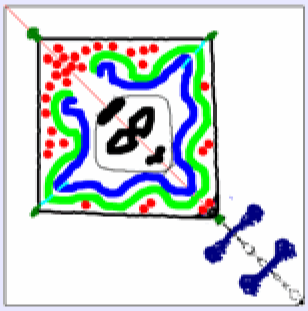
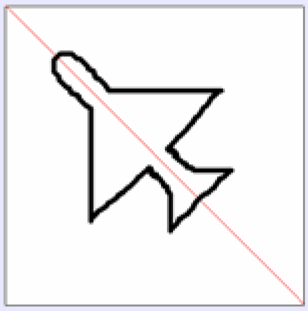
Draw 2-D shapes according to simple directions

2.1 Students, while engaged in stories of interest to them, are afforded simple instructions or rules that they then use to construct results that, in one case or another, are straight lines, straight light segments, polygons (e.g. triangles, quadrilaterals, rectangles, squares, trapeziums, kites, etc) and circles in the plane. The result may be used to engage students in discussion about symmetry that the shape may or may not have. (With page 42)

2.1.1 Students are allowed to have an inventory of shapes and properties. Which of these shapes can be cut in half and one side is the same as the other – symmetry. Further investigation to reveal how many ways can this be done (number of lines of symmetry).

Lines of Symmetry in objects

Sample Artwork	Example Shape
	
	
Lines of symmetry continued	
	

2.2 Students use ruler and protractor to draw various plane shapes (with or without angles labelled).

Select and use their own criteria to classify 2-D shapes (with page 42)

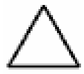
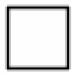
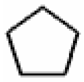
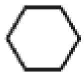
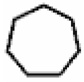
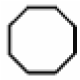
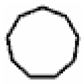
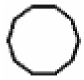
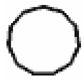
3.1 Students work in small groups to come up with their criteria and report to the rest of the class.

3.2 Students discuss assumptions made in coming up with selected criteria.

Solve simple problems involving properties of 2-D shapes

4.1 Students are afforded some shapes (such as regular polygons and the circle) in the plane and a list of properties and are asked to determine which of the properties in the list their shapes have.

Properties of regular polygons

		If it is a Regular Polygon..	
Name	**Sides**	**Shape**	**Interior Angle**
Triangle *(or Trigon)*	**3**		60°
Quadrilateral *(or Tetragon)*	**4**		90°
Pentagon	**5**		108°
Hexagon	**6**		120°
Heptagon *(or Septagon)*	**7**		128.571°
Octagon	**8**		135°
Nonagon *(or Enneagon)*	**9**		140°
Decagon	**10**		144°
Hendecagon *(or Undecagon)*	**11**		147.2

4.2 Students are afforded some plane shape and work out given line associated with the plane shape is a line of symmetry.

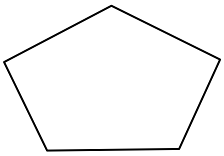
4.3 Students work out the number of triangles that can be found in another plane shape.

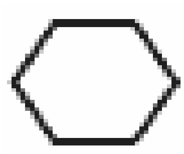
4.4 Students solve simple problems involving angle properties of triangles. (Knowledge of the fact that the sum of the three angles is 180 degrees.)

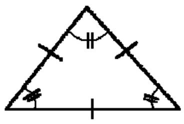
RESOURCES
Plain paper, pencil, ruler, protractor

ASSESSMENT

- Given some 2-D shapes, can classify them in a variety of ways.
- Can use simple directions to draw 2-D shapes.
- Given some 2-D shapes, can select and use their own criteria to classify them.
- Given some 2-D shapes, can solve simple problems involving their properties. For example:
  - Can choose any three 2- D shapes to create a pattern of their own
  - Can use the diagrams shown to complete the table below.







Equilateral Triangle

Shapes	No. of angles	No. of equal sides	No. of Acute angles	No. of obtuse angles	No. of Right angles
Rectangle					
Equilateral triangle					
Pentagon					
Hexagon					

TERM 2 STRAND 3 Measurement UNIT 3: Measurement – volume

AT 3	LO 3: Create and solve real life problems involving basic standard units of capacity ***Success Criteria***

1. Justify the need for the millilitre as a unit of capacity.
2. Estimate, measure and record the capacity of containers using ml and litres.
3. Create and solve real life problems involving ml and litre.

ACTIVITIES

Justify the need for the millilitre as a unit of capacity

1.1 Students are engaged in an exercise or discussion or demonstration to help them appreciate the difference between capacity and volume.

- Teacher can use (1) a stone and (2) a cup to differentiate capacity ("hold") and volume ("space occupied"). The capacity an object (such as a cup or stone) has is the amount it holds. Its volume is the space it occupies.

- If you dip a cup into a bucket that is full of water, the amount of water that overflows is the volume of the cup.

- A container's capacity may change even when its volume remains the same. Imagine a cup getting so thick that though its size remains the same, the region for holding water or some other liquid decreases. (Its volume can also change without change in its capacity)

1.2 Students could observe as teacher demonstrates water from some source is poured into a container to get 1 litre. They are prompted to conclude that the need for the ml arises in a situation where we must have less than 1 litre.

1.3 Students are shown a variety of instruments that measure capacity in science.

1.4 Students observe a display of containers and use the litre to compare their capacity. Students are led to discover that in some case to make a better comparison they must use the millilitre.

Estimate, measure and record the capacity of containers using ml and litres

2.1 Students may be led to fill the objects, pour water in measuring cylinder, then record the capacity. This could include bottles 250 millilitre or cubic centimetres, 500 ml, 1 000 ml, etc

2.2 Students estimate the capacity of containers brought to the classroom and in a table record their estimates. In the same table, students then find measured values of capacities. They use the tables to see how close their estimates were to the more precise values.

Create and solve real life problems involving ml and litre

3.1 Students (in discussing the relation that metric units have to imperial ones) use table or chart showing metric and imperial units for capacity. They are guided in making simple conversions based on containers brought to the classroom. Example: fruita bottle – 1 litre = 0.22 gallons.

3.2 Students are related a story in which Mrs Monroe is buying oil. It comes in small, medium and large bottles. If small bottles are 500ml, medium bottles are 709ml and large bottles are 3 litres, and Mrs. Monroe buys 3 small bottles, 2 medium bottles and 1 large bottle, how much oil does she buy?

RESOURCES

Containers, charts, activity sheet, measuring cups (dropper 1 ml, spoon 5 ml, cup, 250, 500, 1000)

ASSESSMENT

- Can justify the need for the millilitre as a unit for us to measure a container's capacity.
- Can estimate, measure and record the capacity of containers using ml and litres. For example, can rearrange a given set of containers from largest capacity to smallest
- Can create and solve real life problems involving ml and litre. For example, can express in millilitres (ml) or cubic centimetres (cm^3) a capacity of 3 litres.

TERM 2 STRAND 3 Measurement UNIT 4: Measurement – mass

AT 3	LO 4 mass: Create and solve real life problems using the standard units of mass ***Success Criteria***

1. Identify the practicality of the various units of mass for a given situation.
2. Create and solve real life problems involving mass in grams and kilograms.

ACTIVITIES

Identify the practicality of the various units of mass for a given situation

1.1 Students are sent out on an excursion or visit to nearby shop to buy cheese, sausage, salt, sugar, etc. They are asked questions related to aspects of mass. Establish units, small – large.

1.2 Students are led to appreciate that one can make a determination (measurement) of an object's mass through use of an instrument. In the metric system the instrument (for us to measure mass) is calibrated in units such as grams and kilograms.

1.3 Students are engaged in discussing whether an instrument calibrated in
- grams would be suitable for measuring the mass of, say, the earth (or other very massive objects).
- kilograms would be suitable for measuring the mass of, say, a fly (or other objects whose masses are likely to be small).

1.4 Students brainstorm on the instruments (e.g. a beam balance) used to measure mass. Or as a project, students may be allowed to research various instruments that we can use to measure mass.

Create and solve real life problems involving mass in grams and kilograms

2.1 Students use chart showing the relationship between grams and kilograms to categorize a number of items according to their masses.

2.2 Students use conversion charts to solve problems involving conversion from imperial units to grams and kilograms. For example, they say the mass of an item in kilogram when told the item is 17 lbs and each kilogram is 2.2 lbs.

RESOURCES

Chart, measuring scales, shops, activity sheet

ASSESSMENT

- For a given situation, can identify units of mass that are most suitable.
- Can solve problems involving mass in grams and kilograms. For example, can offer correct responses to items such as:
  - Copy and complete i) 500 g = _____ lbs. ii) 1 $\frac{1}{2}$ lbs = _______ grams iii) 3.5kg = ___ lbs
  - A bag holds 50kg of flour. If a packet of flour holds 250g, how many packets can be filled from the bag of flour?
  - Troy and Micah put $\frac{3}{4}$ kg of mango slices to dry. The dried mango weighed 266g. How many grams less did it weigh after it had dried?

TERM 2 STRAND 4 Statistics and Data Handling UNIT 4: Statistics

AT 4	LO 1: Collect data to solve problems using a variety of methods ***Success Criteria***

1. Describe procedures for collecting data through observation, interview and the use of questionnaires.
2. Select appropriate means (observation, interview, questionnaires) of collecting data for a particular problem situation.
3. Plan data collection activities.
4. Collect data through observation, interviews, or the use of questionnaires to solve real life problems.

ACTIVITIES

Describe procedures for collecting data through observation, interview and the use of questionnaires

1.1 Students are posed questions that can be answered by describing procedures to collect data:

1.1.1 Peter lives in Canada. He wants to buy shoes for his relatives in Portsmouth. How would he collect the data?

1.1.2 The Government wants to know how many persons live in Dominica. How would the Government collect the data?

1.1.3 A member of Government has made a statement which every one is talking about. How would the reporter get more information?

1.2 Students in a simulation exercise are given tasks that allow them to describe data collection means.

- If the task is to decide what recommendation to make to a teacher, describe procedures such as "Observe the person teach a lesson and after the lesson have an interview with the person."
- If the task is to find out something in particular that happens in homes in the community, describe how to construct a questionnaire that can be administered to a sample of homes in the community.
- If the task is to decide which player in a particular game of sports (e.g. cricket) deserves to be regarded as number one, describe procedures for collecting the scores of various players.
- If the task is to decide which student in the class has the greatest weight, describe procedures such as "Observe the reading on…"

Select appropriate means (observation, interview, questionnaires) of collecting data for a particular problem situation

2.1 Students are posed with particular cases and engaged in discussing (with reasons) the method that can be used to collect the required data to answer the question. For example, say why (or why not) to

- Select observation where a map or a picture is to be used
- Select interview where a telephone is to be used
- Select questionnaire if the task is, say, in a given community, to find out the number of persons that own a vehicle.

2.2 Students are given a situation where Paul wishes to find out the most popular means that people use to get to the market or the farm (or the most popular area from which students of a given class come). Students are shown options that Paul has and led to say with reasons which means he should select.

Plan data collection activities

e.g. for (i) vehicle colours, (ii) ages of 18 students in school, (iii) height of 10 students, (iv) days of week/ number of students late, (v) profession/ number of students

3.1 Jerry is planning to collect water-related data, example, the amount of water that players drink during a game. The discussion is guided to let students appreciate that in the plan you must identify

- the area or site at which data is to be collected, e.g., on a cricket field while a game is being played or at the market while buying or selling is happening or in a kite festival.
- The instrument to be used.

3.2 There are 100 persons sick at the Princess Margaret Hospital of a stomach illness. How would you plan to collect data to investigate?

Collect data through observation, interviews, or the use of questionnaires to solve real life problems

4.1 Students are engaged in data collecting activities related to some field of interest such as cricket (or some other sports), farming, fishing, etc that makes use of observations, interviews and questionnaires.

4.2 Students are engaged on outings designed to collect data to answer various questions that have been identified.

RESOURCES

Questionnaire sheet

ASSESSMENT

- Can describe procedures involving the use of observation, interview and questionnaires to collect data.
- For a particular problem situation, can select appropriate means (observation, interview, questionnaires) of collecting data.
- Can plan data collection activities.
- Given a real life problem, can collect data through observation, interviews, or the use of questionnaires to solve it.

TERM 3 SUMMARY No. of	
UNITS	**SESSIONS**
UNIT 1: Number *AT 1: LO 4* *Success Criteria*: 1 – 7	3 weeks
UNIT 2: Measurement – time AT 3: LO 5 Success criteria: 1 – 2 **UNIT 3: Measurement – money** AT 3: LO 6 Success criteria: 1 – 5	1 week 2 weeks
UNIT 3: Statistics AT 4: LO 2 Success criteria: 1 – 3	2 weeks
UNIT 4: Patterns AT 5: LO 2 Success criteria: 1 – 2	1 – 2 weeks

UNIT PLAN WITH SUGGESTED TEACHING, LEARNING & ASSESSMENT ACTIVITIES

TERM 3 STRAND 1 Number UNIT 1: Number

AT 1	**LO 4: Solve problems involving fractions and decimals** ***Success Criteria***

1. Use diagrams/pictures and mental strategies to convert an improper fraction to a mixed number and a mixed number to an improper fraction.
2. Generate fractions that are equivalent to a given fraction.
3. Identify, represent and write simple decimal numbers with up to one decimal place (e.g. 1.5, 2. 2) using base 10 materials and diagrams in real life situations.
4. Collect and discuss examples of metric measurements on items.
5. Explain how fractions, decimals and whole numbers are related.
6. Identify and discuss the place and total value of the digits in a decimal number with up to one decimal place.
7. Use a variety of strategies to solve simple real life problems involving fractions and decimals.

ACTIVITIES

Use diagrams/pictures and mental strategies to convert an improper fraction to a mix number and a mixed number to an improper fraction

1.1 Students are given a few sheets of paper and each paper is folded into (i) two equal parts, (ii) three equal parts, (iii) four equal parts. A: Conjecture on 5, 6, 7, 8, 9, 10, …, 16. B: Meaning of numerator and denominator.

Or

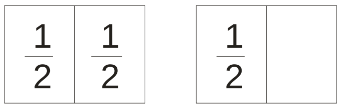
1.2 Students are led so that an object such as a rectangular sheet of paper is seen entering a machine at one point and then getting out, but not before a mark is left on it, as suggested in the case below.

1.2.1 Students are asked to look at the material and, using the idea of fraction, think of how it may be described (i) before entering the machine and (ii) after having gone through the machine. They are led to say (i) before it is $\frac{1}{1}$ and (ii) after it is $\frac{2}{2}$.

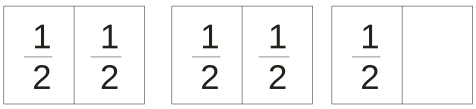
(a) Students are led to see this is the same as the saying, "A whole is two halves." They may then be posed with the question, "How many thirds would a whole be?" or the question, "How many tenths would a whole be?" or the question, "How many hundredths would a whole be?"

For (b) to (d) below students can be given 2 sheets of paper and fold each in equal amounts

(b) Students are posed questions: Can we have, say, 5 halves? Show what is involved. How many whole sheets are involved?



3 halves



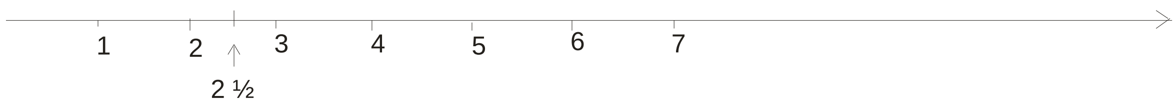
5 halves

(c) Students are led to appreciate that to say 5 halves, the deducer in mathematics writes $5\text{x}\frac{1}{2}$ or more simply $\frac{5}{2}$

(d) Students are questioned to say why another way to say $\frac{5}{2}$ is $2+\frac{1}{2}$. They are then led into saying that the latter is a mixed number, written more simply as $2\frac{1}{2}$.

1.3 Students are told a story in which someone from earth takes a journey to the moon only to find when he gets there that his strength is only a fraction of what it is on earth. Students are asked to suppose what gives or indicates his strength on the moon is "two and a third."

- Students are asked to suggest how to write this as a figure. One suggestion comes as 2 1/3.
- Students are asked to say what kind of number this is. One suggestion comes that it is a mixed number.
- Students engaged in explaining what a mixed number is. Use is made of a number line to position 2 1/2.



- Students are invited to see that the number involves two parts. The first part is a whole number, 2, which also appears as 1 + 1. The second part is a proper fraction, 1/2. Students are led to see that 2 1/2 can also appear as 2 + 1/2. Students use materials to come up with illustrations. Examples: two strips and one-half of a strip; two metre rules together with one-half of a metre rule. Students are led into a discussion to say how many halves this is (altogether). They produce a piece of reasoning, saying, for example, "Since there are two halves for each unit, for 2 units we have four halves. Putting this together with the next half means that in all we have five halves. Conclusion: in 2 1/2 or 2 + 1/2 there are five halves."
- Students are asked to suggest how to write seven thirds as a figure. Students conclude the answer is 7/3, an improper fraction. This means 2 1/3 is 7/3. Students make a general statement, saying, for example, "So we have gone from a mixed number to an improper fraction."

1.4 Students are invited to suggest other examples of mixed numbers. For each example given, students are helped in a group or whole class discussion to carry out the conversion to the corresponding improper fraction.

Generate fractions that are equivalent to a given fraction

2.1 Students are engaged in building a table or pattern as exemplified below that speaks to the way whole numbers are written as fractions.

Whole number	Fraction
1	$\frac{1}{1}$
2	$\frac{2}{1}$
3	$\frac{3}{1}$
. . .	

- Students are led to notice that when any number is multiplied by 1, the result is the same number.
- Students are led to appreciate that the form of 1 used in doing the multiplication may be any number over itself, for example, $\frac{2}{2}$ or $\frac{5}{5}$ or $\frac{8}{8}$.
- Students are allowed to discuss the meaning of this in terms of equivalent fractions we can generate if given a fraction. They get into saying, for example, that if given the fraction $\frac{1}{4}$, we can, by multiplying by 1, or multiplying both numerator and denominator by the same number generate 2/8, 3/12, 4/16, 5/20, …

2.2 Students are shown some equivalent fraction generated from a given fraction and asked to suggest the form of 1 that is used in the generating of that result. For example, in being shown the fraction 20/30 generated from 2/3, students proceed to deduce that the form of 1 used is 10/10. NB: Use the same sheet of paper fold in 2, then in two, then in two, again up to twelve. Thereby produce a chart.

Identify, represent and write simple decimal numbers with up to one decimal place (e.g. 1.5, 2.2) using base ten materials and diagrams in real life situations

3.1 Students are given various numbers that may be written on cards or slips of paper and which is connected to some real life situations. They are offered that the number in their hands may be a decimal number. They are led to identify the cases in which this is true.

- They are led to appreciate that 1.5 means 1 + 0.5 and that this is used when, to say dollar fifty, we write $1.5
- They are involved in illustrating this decimal number using base ten materials

3.2 Students are engaged to make the connection that from fraction to decimal we have $\frac{1}{10} = 0.1$

$$10 \text{ cents} = \frac{10}{100} = 0.10$$

25 cents =

$$50 \text{ cents} = \frac{50}{100} = 0.50$$

75 cents =

$$100 \text{ cents} = \frac{100}{100} = \frac{1}{1}$$

150 cents = 100 + 50 cents

3.3 Students are walked through other suitable examples and allowed to offer their own cases.

Collect and discuss examples of metric measurements on items

4.1 Students are reminded that we can measure things such as lengths, distances, heights, temperatures and we can price items. They are also reminded that when measurements are made, or when prices are offered, they have to be recorded. It often happens that in recording some measurement (made through some instrument) we involve decimals. Students are allowed to make a collection or a list or a table of instances in which decimals are involved.

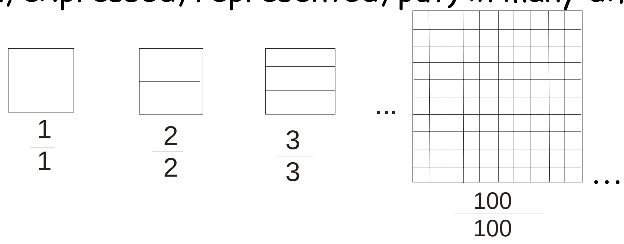
4.2 Students are offered statements such as "$5.30 for the soap" and allowed to discuss the decimal used in saying the price the item.

Explain how fractions, decimals and whole numbers are related

5.1 Students are engaged to see that

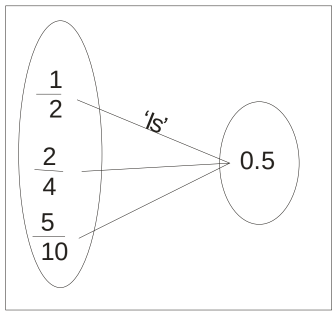
$$50¢ = \frac{1}{2} \text{ of a dollar } = 0.50 \text{ etc.}$$

5.2 Students are engaged to recall that one whole can be said (written, expressed, represented, put) in many different ways.



- Students are engaged in making observations that these fractions are equivalent. These diagrams represent the same whole.

5.3 Students are shown a diagram such as the one that follows and engaged in discussing the relation of fractions to a given decimal.



- If the whole is divided into 2 halves and 1 out of 2 parts is selected, the fraction is 1/2
- If the whole is divided into 4 fourths and 2 out of 4 parts are selected, the fraction is 2/4
- If the whole is divided into 10 tenths and 5 out of 10 parts are selected, the fraction is 5/10
- In each of these cases, the decimal is the same, 0.5

5.4 Students are engaged in discussing the case in which we have two parts, one of which is a whole number part. An example is 2.5. This is a shortened way of writing 2 + 0.5. We know already what the '0.5' part is already in terms of a fraction. So we can write 2.5 in many different ways, which includes $2 + \frac{5}{10}$ or $2\frac{5}{10}$ or $\frac{25}{10}$.

Identify and discuss the place and total value of the digits in a decimal number with up to two decimal places (money)

6.1 Students are engaged so that a certain decimal number enter their sight. They are led to say the number has digits, just as it is that a person has dreams. Students are allowed to appreciate that the meaning of these digits is their value.

- Students are allowed to infer that to identify the value in any case, such as that of the number 43.1, use is made of table as illustrated below.

...Hundreds	Tens	Ones	Tenths	Hundredths

- Students are led to see that the value of the 1 in 43.1 is 1 tenth or 1/10. They appreciate a representation of 43.1 is $40 + 3 + \frac{1}{10}$

$$43.1 = \text{forty three point 1}$$
$$40 + 3 + \frac{1}{10}$$

6.2 Students are presented with a string of such cases for representations to be identified and discussed.

Use a variety of strategies to solve simple real life problems involving fractions and decimals

7.1 Students are posed with question, "If I have 40 dollars, how many ten cents or tenths do I have?" They are engaged to appreciate that this amounts to saying, "I want 40 written in terms of tenths." In class discussion students are brought to see the statement to be made is 40 = 400ths or $40 = \frac{400}{10}$

$$\text{Half} = \frac{?}{2}$$

$$\text{fifth} = \frac{?}{5}$$

$$\text{sixth} = \frac{?}{6}$$

$$\text{tenth} = \frac{?}{10}$$

7.2 Students are posed with question, "If I have 3 dollars, how many ten cents or tenths do I have?" They are led to see that this means I have 30 tenths or $\frac{30}{10}$.

7.3 Students are coached to connect the above pieces to realise that another way of saying $40+3+\frac{1}{10}$ is $\frac{400}{10}+\frac{30}{10}+\frac{1}{10}$, in other words, that one has the statement

$$40+3+\frac{1}{10} = \frac{400}{10}+\frac{30}{10}+\frac{1}{10}$$

RESOURCES

Fraction charts, number lines, activity cards

ASSESSMENT

- Given an improper fraction, can use diagrams/pictures and mental strategies to convert it to a mix number.
- Given a fraction, can generate fractions that are equivalent to it.
- Can use base 10 materials and diagrams in real life situations to identify, represent and write simple decimal numbers with up to one decimal place.
- Can collect and discuss examples of metric measurements on items.
- Can explain how fractions, decimals and whole numbers are related.
- Can identify and discuss the place and total value of the digits in a decimal number with up to one decimal place.
- Can use a variety of strategies to solve simple real life problems involving fractions and decimals.

TERM 3 STRAND 3 Measurement UNIT 2: Measurement – time

AT 3	**LO 5: Create and solve time-related problems with speed and accuracy** ***Success Criteria***

1. Create and solve problems involving time.
2. Record and read measurements of time using a variety of time notations.

ACTIVITIES

Create and solve problems involving time

1.1 Students are allowed to hear a story in which the word time is repeated about 10 times. These times are read or written in digital and analogue formats. Opportunity to (i) have emphasis on word time (duration), (ii) establish analogue, (iii) establish digital.

1.2 At 5 o'clock Mary started out on a quest that she hoped would allow her to bake a cake. At 8:15 the cake was baked. How long was that cake-baking exercise?

1.3 Jeremiah began a test at 9:15 am. He thought it would be over at 10:10 am. It was not until 12:05 am that he managed to hand in his paper. How much longer was the test than Jeremiah's estimation?

1.4 To board a flight to St. Thomas, Janet must arrive at the Melville Hall Airport at 2:40 pm. Students are allowed to say the latest time she should begin to get ready for that trip if she must allot five minutes for getting ready and an hour and fifteen minutes for the journey to the airport.

1.5 Students are asked to draw the times at which their daily events occur and show on a time-line. Students are allowed to construct a time-line from waking up to sleeping. They are then engaged in calculating the length of time for various stretches.

1.6 At Carve's Bus Stand buses arrive at a definite time interval, every 35 minutes. If the last bus left at 13:15, write the arrival time of the next three buses.

Record and read measurements of time using a variety of time notations

2.1 Students are engaged in saying given times in another way.

2.2 Students are engaged in time reading and recording exercises through use of the 24-hour clock. Tables may be constructed to show correspondences between notations.

RESOURCES

Activity cards, clocks, watches

ASSESSMENT

- Can create and solve problems involving time.
- Can record and read measurements of time using a variety of time notations.

TERM 3 STRAND 3 Measurement UNIT 3: Measurement – money

AT 3	**LO 6 money: Create and solve real life problems involving simple profits and losses** ***Success Criteria***

1. Describe situations that involve the use of large amounts (thousands of dollars) of money.
2. Prepare and justify simple budgets.
3. Define and discuss the terms cost price, selling price, profit, loss and discount in given situations.
4. Calculate profit given cost price and selling price.
5. Explain the difference between profit and loss.
6. Calculate simple discounts.

ACTIVITIES

Describe situations that involve the use of large amounts (thousands of dollars) of money

1.1 Students are engaged in discussing who uses large amounts of money. This is done so that mention is made of bank and government. At the end a list is produced. Students are afforded opportunity to report on the largest amount they know of.

1.2 Students are engaged in a simulation in which transactions involve large amounts of money.

Prepare and justify simple budgets

2.1 Discussion on the word budget (Parents, Government, Institution, Me)

2.2 On a monthly basis, a certain man and his wife together bring in $5 000. Students are engaged using this money to make a budget which assigns a definite amount of the money for various "events" or "sectors" such as groceries, clothing, rent, utilities, laundry, entertainment, hire purchase, gas for vehicle, bus for children.

2.3 Students imagine (i) the money they receive on, say, a monthly basis and (ii) the items for which they money would be used. In groups, they are engaged in making a budget to be presented before the rest of the class.

Define and discuss the terms cost price, selling price, profit, loss and discount in given situations

3.1 Students are engaged in discussion to appreciate the point that keepers of inns or owners of firms must pay to get desired items into their units. The cost price is the money one has to send out to secure the item. The selling price is the money delivered into one's hand once one sells the item. Profit is the difference when the selling price is greater than the cost price. The loss is the difference if the cost price is greater than the selling price. The discount is the money removed from the (original) selling price.

3.2 To identify the words cost price, selling price, profit, loss from a business transaction.

3.2.1 Situation 1: John orders a playstation from the US. It cost him $100 US. Mary wants to buy the playstation. John sells it to her for $500 EC.

3.2.2 Situation 2: Joan bought a calculator for $100 EC. She brought the calculator to school and realised that she could not use it. Mary wanted the calculator but decided that she could pay only $90. Joan sells the calculator to her. What has just happened?

3.3 Students are engaged in discussion to understand that when a profit is made the individual is better off, or at a higher level financially.

3.4 Students are related a story in which Jerry has some nice things (40 of them) that were delivered into her hand after she spent $400. After spending an additional 100 dollars, she gets the items to where they are worth $20 each. Students are engaged in discussing cost price, selling price and profit as it applies to this case.

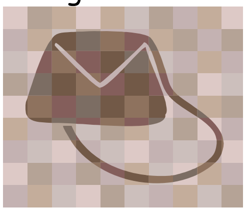
Calculate profit given cost price and selling price

4.1 There is a shortage of graph paper at the school. Mave has a 50 page graph book which she bought for $10.00. She sells each sheet for 30 cents. Does she make a profit or a loss?

4.2 Students are engaged in discussing various scenarios and are afforded a teacher-led demonstration of the steps involved in the calculation of profit and loss.

4.3 Students are engaged in addressing cases such as:

- Sue bought a number of items and resold them. Calculate her profit or loss.

a)  buying price $85.95 selling price $125.00

b)  buying price $ 485.00 selling price $634.00

c)  buying price $6.75 selling price $5.95

Explain the difference between profit and loss

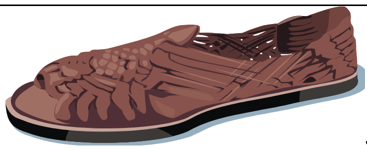
5.1 Imani reports on an activity in which he was engaged. In the end he says, "It was a worthwhile venture. I made a profit." Students are questioned to suggest how the venture could be described if Imani had made a loss.

Calculate simple discounts

6.1 Students discuss this sign. Teacher encourages discussion on the word discount… reduction in selling price by

DISCOUNT! DISCOUNT!AND MORE DISCOUNT
Buy any item on display and get 50% off

$85.00



$215.00

$ 30.90

6.2 Students are afforded opportunity to be engaged in small groups in the calculation of discount.

RESOURCES

Magazines, newspapers, business places, activity cards

ASSESSMENT

- Can describe situations that involve the use of large amounts (thousands of dollars) of money.
- Can prepare and justify simple budgets.
- Can define and discuss the terms cost price, selling price, profit, loss and discount in given situations.
- Can calculate profit given cost price and selling price.
- Can explain the difference between profit and loss.
- Can calculate simple discounts.

TERM 3 STRAND 4: Statistics and Data Handling UNIT 3: Statistics

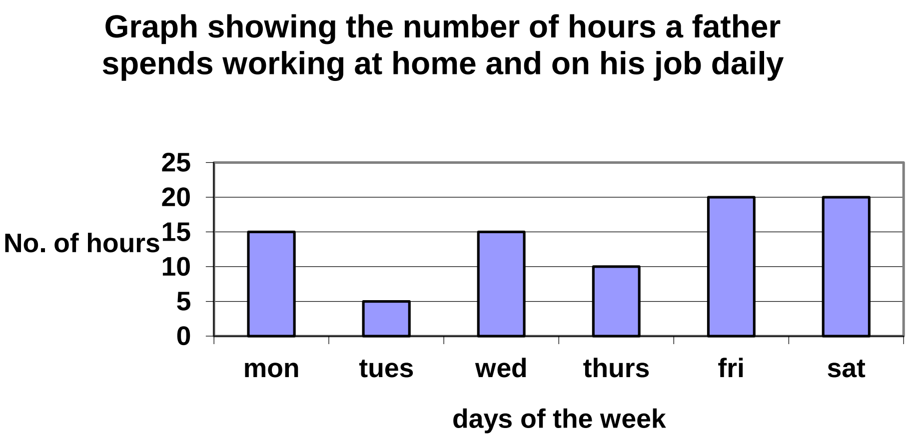
AT 4	LO 2: Use, construct and interpret simple graphs using a variety of methods *Success Criteria*

1. Read and interpret data presented in tables, pictographs, bar graphs and line graphs in real life problems.
2. Select appropriate scales for representing data in pictographs, bar graphs and line graphs and give reasons for their choice scale.
3. Undertake and present a simple project related to their interest that involves collection of data, graphical representation of data and results of findings.

ACTIVITIES

Read and interpret data presented in tables, pictographs, bar graphs and line graphs in real line problems

1.1 Students are shown a graph that they are allowed to use to answer questions.



a. On what day of the week is the father most likely to spend more time? Why?
b. How many hours did the father work for the week?
c. How many hours did the father work altogether on Mondays, Wednesdays and Fridays?
d. The father worked for thirty hours on Thursday and Friday, on which two other days did the work for thirty hours?

Select appropriate scales for representing data in pictographs, bar graphs and line graphs and give reasons for their choice

2.1 Students are afforded data as suggested below and asked to

- draw a bar graph
- draw a line graph
- compare the two graphs

A restaurant carried out a survey to find out the favourite foods purchased by its clients on a daily basis. The results were as follows:

Hot Dogs - 50
Pizzas - 60
Roti -30
Calaloo - 30
Green banana
& saltfish - 40

2.2 Students are presented with checklist and procedure (data, axes) to be considered when plotting graphs.

	√	x
Did you choose an appropriate scale for your graph?		
Did you draw and label your graph correctly?		
Did you include the necessary data in your graph?		
Did you explain what you thought well?		
Did you use math language?		

√ Yes
X no

Undertake and present a simple project related to their interest that involves collection of data, graphical representation of data and results of findings

3.1 Students are to identify the data collection methods used in the situation, where they went to obtain the data, the questions that were asked, and to whom. Students talk about what happened while they were collecting the data.

3.2 Students are engaged in looking for examples of data representation in newspapers and magazines. They are allowed to explain what the various graphs show as well as the similarities and differences between them. They are engaged in using different ways to represent data they collected. They are questioned to identify which of the various representations were more effective and why. Students use the data to make up problems.

RESOURCES
Graph paper, charts, activity sheets, school environment

ASSESSMENT
- Can read and interpret data presented in tables, pictographs, bar graphs and line graphs in real life problems.
- Can select appropriate scales for representing data in pictographs, bar graphs and line graphs and give reasons for their choice scale.
- Can undertake and present a simple project related to their interest that involves collection of data, graphical representation of data and results of findings.

TERM 3 STRAND 5 Patterns, Functions and Algebra UNIT 4: Patterns

AT 5	**LO 2: Investigate number patterns** ***Success Criteria***

1. Investigate and create patterns involving various types of numbers (e.g. square numbers, consecutive numbers, odd numbers etc.).
2. Conduct simple number investigations.

ACTIVITIES

Investigate and create patterns involving various types of numbers

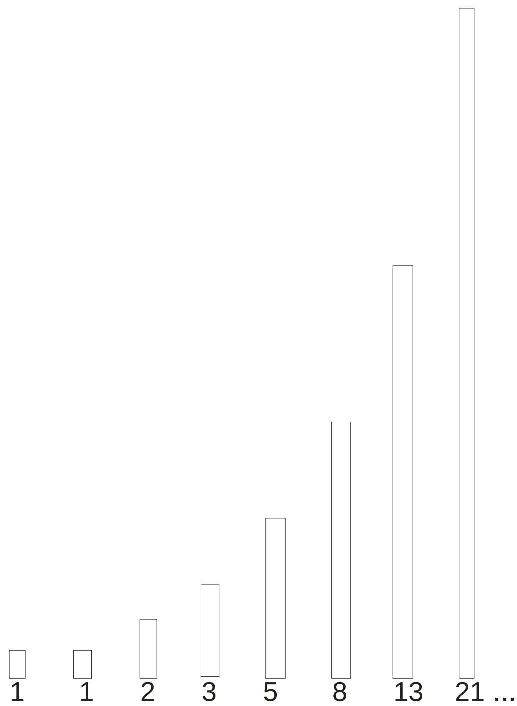
1.1 Characteristics of a pattern or sequence (commas, three dots, elements of the sequence)

1.2 Students are related a story in which, to some inhabitants that he meets while on a voyage, Paul announces that has something he wants to show. Once the people settle down to hear Paul's story, what appeared is the sequence …, 0, 1, 2, 3, … Paul goes on to explain to them that the numbers in this sequence are examples of integers. He explains that the string of three dots '…' is used for the other examples that are not shown. Students wonder what the other examples might be. They make suggestions, or are left with the assignment as a research project.

1.3 Students are introduced to patterns, simple to more challenging:

	0, 1, 3, 6, 10, ...	
	1, 5, 9, 13, ...	
0, 1, 2, 3, ...	Square numbers	To identify
1, 3, 5, 7, ...	2, 4, 8, 16, ...	(i) elements
2, 4, 6, 8, ...	3, 9, 27, ...	(ii) rule
3, 6, 9, 12, ...	Fibonacci	(iii) next three terms

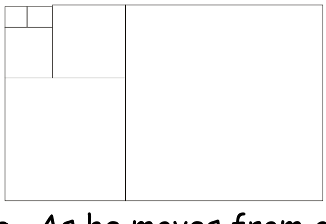
1.4 Students are prompted to realise that one of the patterns they can come up with using this sequence was first introduced by a certain individual called Fibonacci of such and such. They are led to an illustration of the sequence using poles.



- Students are invited to explain what is happening in this case. They are led to say that if the first two terms are each 1, then the next term is always the sum of the preceding two terms.
- Students identify other terms in this pattern.

1.5 (i) Look at the numbers in the Fibonacci sequence, that is, the sequence 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, … Imagine that each number in turn represents one side of a square. Draw the first two squares, each of dimension 1×1, touching each other. (ii) For the next number in the sequence (i.e., 2) draw a 2×2 square attached to the longest side of the rectangle in step 1. (iii) For the next number in the sequence (3) repeat as in step 2, but ensuring the square is attached to the longest side of the rectangle obtained in step 2. (iv) Continue the procedure for other numbers.

Here is an example of what happens for the first six terms in the pattern.

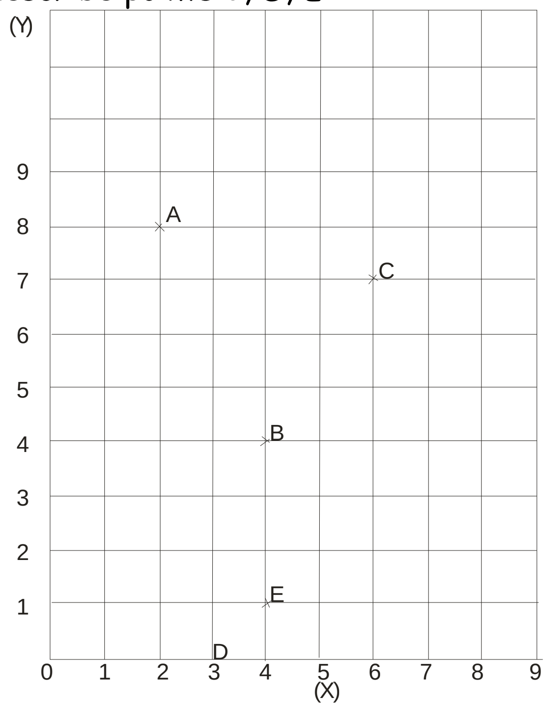


1.6 Peter is on an outing. As he moves from one neighbourhood to the next, he observes vehicles (or, you might prefer, boats, aircrafts, books, apples, miracles, expressions) that appear. He is interested in their number. He finds that in the first neighbourhood, the number is 1. In the second neighbourhood, the number is 4. In the third neighbourhood, the number is 8. In the fourth neighbourhood, the number is 13. In fact, one has 1, 4, 8, 13, __, __, __... Students are asked to predict the number that appears in (i) the 5th neighbourhood, (ii) the 6th neighbourhood, (iii) the 7th neighbourhood.

1.7 Students in various groups are asked to investigate other patterns/ sequences not known.

Conduct simple number investigations

2.1 Students are shown a grid and are engaged to be familiarized with:
2.1.1 the line usually called the x-axis and the one termed the y-axis the fact that x comes before y.
2.1.2 the fact that these lines meet, the point at which this happens usually called the origin and has 0 for x and 0 for y, or (0, 0)
2.1.3 how to mark points on a graph
2.1.4 what it means to say the point A is (2, 8)
2.1.5 what it means to give the co-ordinates of point B.
2.1.6 the way to describe points C, D, E

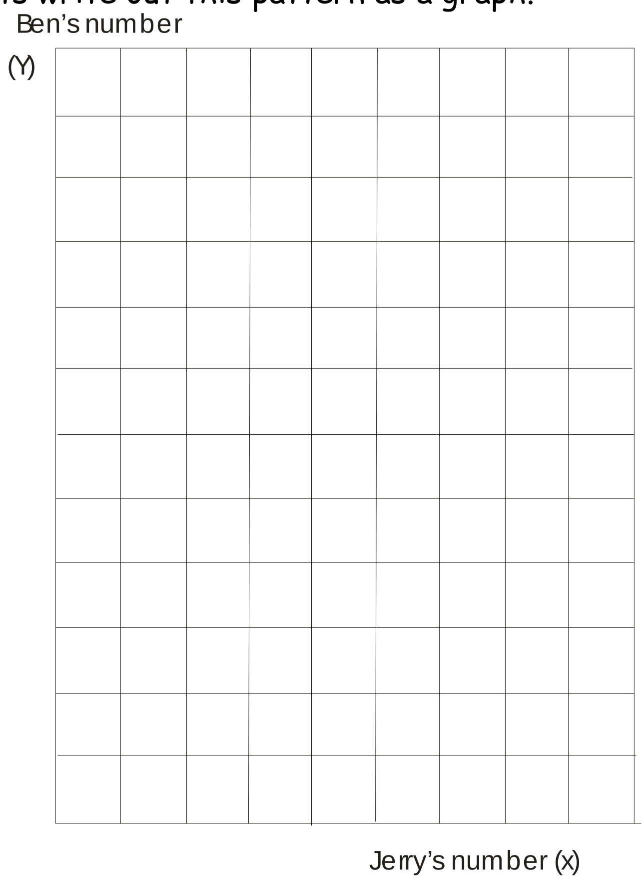


2.2 Ben and Jerry are on a race for numbers (which could be number of runs, of stamps, of dollars, etc.). In this case, it just happens that whatever number Jerry finds, Ben finds a number which is exactly 1 more. This means a possibility is as shown in the table.

Jerry's number (x)	1	2	3	4	5	6	7	8	9	10
Ben's number (y)	2	3	4	5	6	7	8	9	10	11

- Students use this table to discuss whether the pattern shown in this table is Ben's number = Jerry's + 1
  General rule: $y = x + 1$

- Students write out this pattern as a graph.



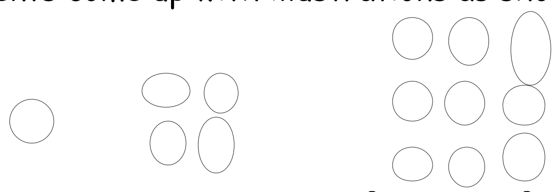
- Students use the graph to predict what number Ben gets if Jerry gets, say, 3.5

-

2.3 Students are related a story in which Kit and Joan are on a drive for numbers (which could be number of leaves of a certain kind, of stickers, of shells, of beads, etc.). In this case, whatever number kit finds, Joan finds a number which is exactly the square of that of Kit. This means a possibility is as shown in the table.

Kit's number (x)	1	2	3	4	5	6	7	8	9	10
Joan's number (y)	1	4	9	16	25	36	49	64	81	100

- Students use the table to discuss the way Joan's number is related to that of Kit. They are note that Joan's number is always the square of Kit's number.
- Students write out this pattern as an equation, a statement with an equal sign.
- Students come up with illustrations as shown below.



1^2 2^2 3^2

…

Joan's # = (Kit #)(Kit #)
= $(\text{Kit } \#)^2$

Generally $y = x^2$ where y is Joan's, x is Kit's

RESOURCES

ASSESSMENT

- Can investigate and create patterns involving various types of numbers (e.g. square numbers, consecutive numbers, odd numbers etc.).
- Can conduct simple number investigations.

Suggested websites

www.lessonplanspage.com	Lesson plans, worksheets
www.mathforum.org	Math tools, breakdown of math topics, interactive math.
www.edhelper.com	Puzzles, lots of student worksheets!
www.lessonplanspage.com/math-htm/	Loads of maths lesson plans for
www.wondrousworksheets.com	Worksheets .N.B only the free worksheets can be printed.
www.ixl.com/math	Another complete maths course Math exercises. Registration is required. There is limited practice if one signs in as a guest.
www.mathworksheetwizard.com	Worksheets. Create your own worksheets for math topic and print them.
www.teachingtime.co.uk	Interactive time games
www.mathgoodies.com	
www.woodlands-junior.kent.sch.uk/maths/index.html	Great site for maths games!
www.coolmath4kids.com/	Student friendly site for students
www.toolsforeducators.com	Free worksheets, worksheet creators, printables wizard and on-line teaching materials. Game makers and programmes for teachers etc.