Application of Number

SAMPLE

EDUCOOT

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Overview for Level 3 Application of Number

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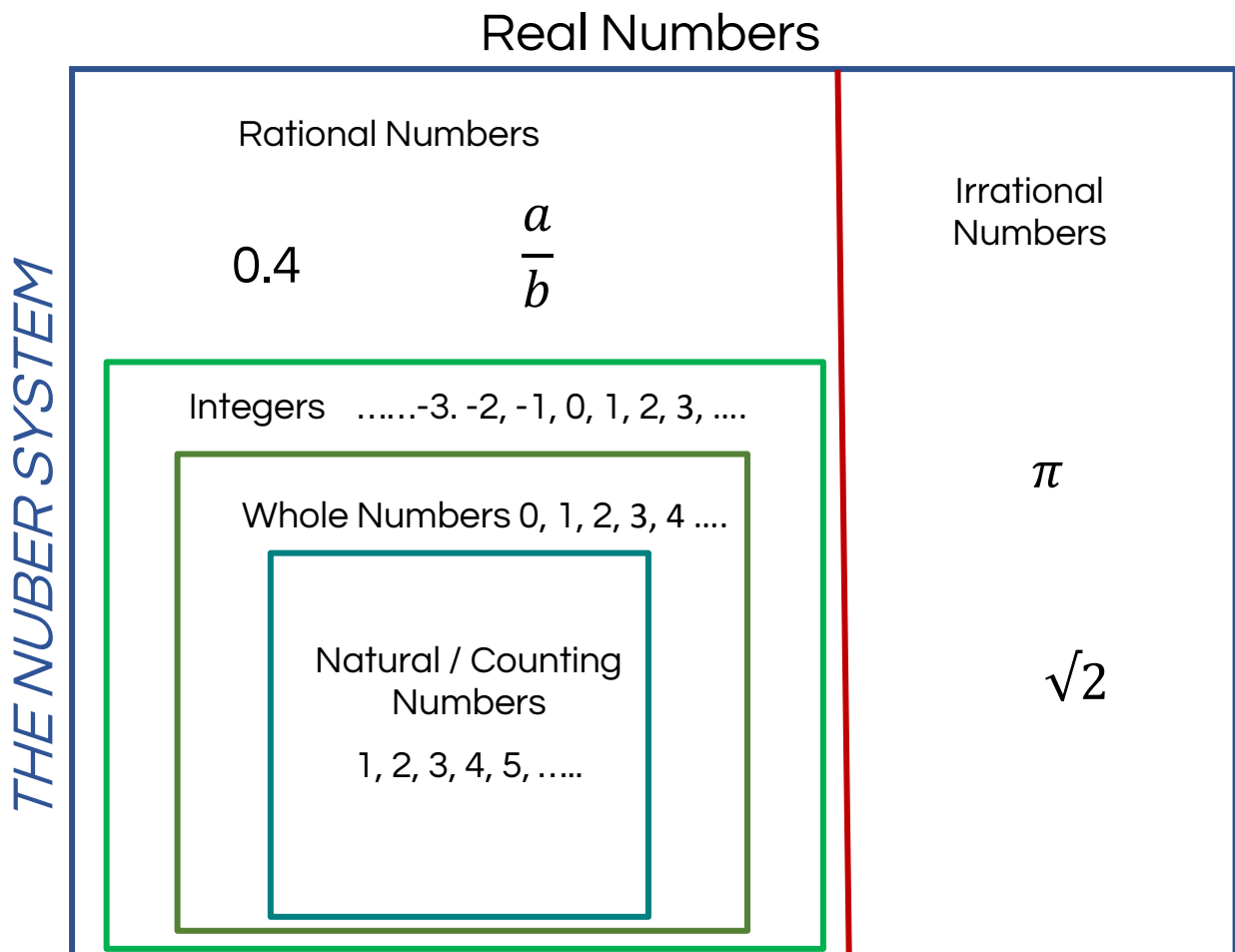
Mapping of Learning Outcomes

A. Number Systems

Natural Numbers (N) - the set of numbers, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, ..., that we see and use every day. The natural numbers are often referred to as the counting numbers and the positive integers.

Integers (Z) - Any of the positive and negative whole numbers, ..., -3, -2, -1, 0, +1, +2, +3, ... The positive integers, 1, 2, 3..., are called the natural numbers or counting numbers.

Real Numbers (R) - the set of real numbers including all the rational and irrational numbers.

1. Look at the diagram:

Real Numbers

THE NUBER SYSTEM

Rational Numbers

0.4 $\dfrac{a}{b}$

Integers   ......-3. -2, -1, 0, 1, 2, 3, ...

Whole Numbers 0, 1, 2, 3, 4 ....

Natural / Counting Numbers

1, 2, 3, 4, 5, ...

Irrational Numbers

π

$\sqrt{2}$

2. What kinds of numbers are these?

> **integers, natural numbers, real numbers**

a) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, ...,

_____

b) all the rational and irrational numbers, for example, 5, ½, 6.5, π

_____

c) ..., -3, -2, -1, 0, +1, +2, +3, ...

_____

3. What is the letter that represents each type of number?

a) integers _____

b) natural numbers _____

c) real numbers _____

R   Z   N

4. Read my shopping list. Write the natural numbers.

N =

_____
_____
_____
_____
_____
_____
_____

5 loaves of bread
2 kg of potatoes
½ melon
4 cans of beans
6 bananas
1 packet of pasta
8 litres of milk
500g of cheese

4. Find and write the numbers:

Answers:

81	23	13	94
44	50	38	42
67	79	80	18

A number that has 7 tens	79	A number that is closest to 56	
A number that has 9 tens		A number that is closest to 86	
A number that is betwen 23 and 13		A number that less then 59	
A number that is betwen 42 and 67		A number that greater then 39	

5. Read and discuss.

> **Look at this number: 4 782 109**
> **It is**
> **4 million**
> **seven hundred and eighty-two thousand**
> **one hundred and nine**

6. Look at the place values:

Millions	Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Units
1000000	100000	10000	1000	100	10	1
4	7	8	2	1	0	9

a) How many thousands are there? _____
b) How many millions are there? _____
c) How many tens are there? _____

C. Rounding Off

What is rounding off?

Rounding means making a number simpler but keeping its value close to what it was. The result is less accurate, but easier to use. Example: 73 rounded to the nearest ten is 70, because 73 is closer to 70 than to 80.

When do we use rounding off in everyday life?

- To do calculations in our heads, e.g. when we are shopping, when we go to a take-away, when we go to the pub, etc. Rounding means we can have an idea what we will pay in each case.
- To get an estimate, e.g. if we were discussing census results, we may round off so that numbers are not so complicated.

Many people use rounding in everyday situations because it is usually easier and more understandable to say a rounded number than to say an exact value.

Example:
23**5** to the nearest 10 is 240
(If the units digit is 5 or above, it goes up to the next ten. If the units digit is under 5, go down to the same ten.)

---

1. Circle the units in each of these numbers:

255 grams
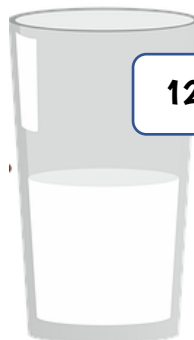
128 millilitres

37 grams

8. Write these numbers to the nearest 1000:

a) 1107_____   e) 2238_____

b) 7893_____   f) 2935_____

c) 8345_____   g) 1469_____

d) 4688_____   h) 9284_____

1. You are having a barbecue for about 35 people. Round off the numbers to the nearest 1000:

FOOD AND DRINK
FOR THE BARBECUE

a) 3750 g minced beef for burgers
b) 2,975 g steak
c) 7,360 g sausages
d) 4535 g of potatoes for potato salad
e) 5072 ml beer
f) 6800 ml wine
g) 9100 ml juice
h) 8932 g ice

Teacher Notes

a) _____   h) _____
b) _____
c) _____
d) _____
e) _____
f) _____
g) _____

15. Work out these rounding problems.

a) A restaurant manager rounds the numbers of meals served in one year to 36000 meals.

Which could be the number of meals served if the manager rounded to the nearest thousand?

Choose all answers that apply:
☐ 36, 400
☐ 35, 800
☐ 36 ,700

b) A café nearby served 64,436 coffees in one year. Round the number of coffees to the nearest thousand.

_____ coffees

c) A bakery rounds the number of kilograms of flour used to 800,000 grams.

Which could be the number of kilograms of flour rounded to the nearest hundred thousand?

Choose all answers that apply:
☐775, 612
☐849,212
☐851,000

d) You have 735 ml of milk to make pancakes. Round this to the nearest ten.
☐ 700 ml
☐ 800 ml
☐ 740 ml

1. Refer to the Dinner Party Menu and recipe cards.

Teacher Notes

a) If you make all three dishes, how long will the preparation time be altogether?

_____

_____

_____

_____

b) How much milk and cream together will you need for all three recipes?

_____

_____

_____

_____

c) If you eat one croquette, a portion of butternut chilli and one serving of cake, how many calories will you consume?

_____

_____

_____

_____

2. Answer the questions.

a) I need 79cm of string for my bird feeder. The string I have is 168cm long. How much string must I cut off?

_____

_____

_____

b) I have two sunflowers in my garden – one is 46cm tall and the other is 65cm tall. What is the difference in their heights?

_____

_____

_____
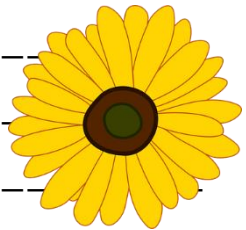
c) Jill drove 189km to the seaside campsite. The sat nav stated the journey was 176km. What was the difference between the distances?

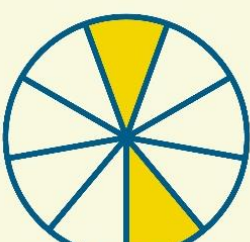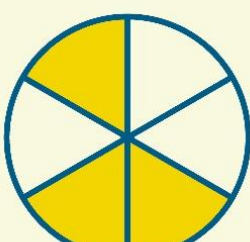_____

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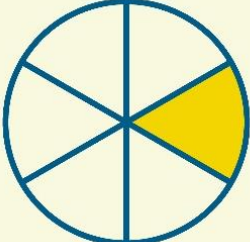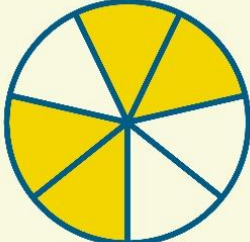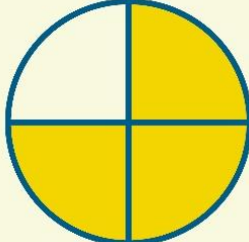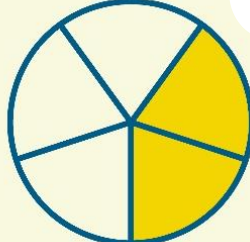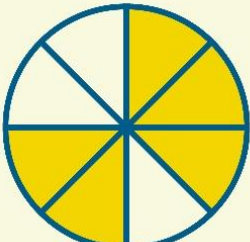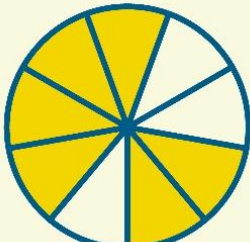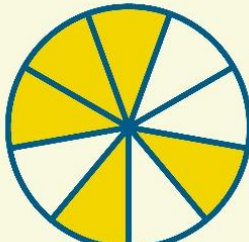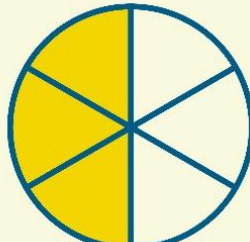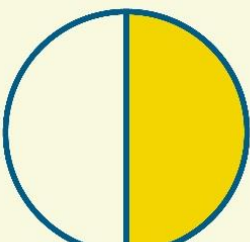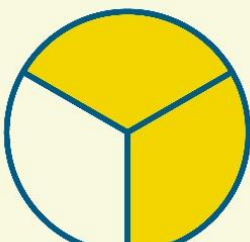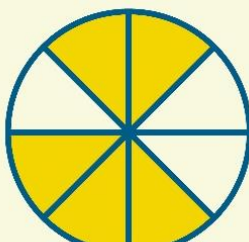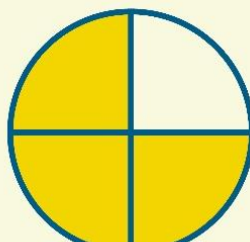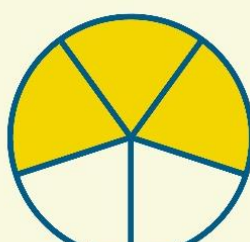
d) My friend and I each had €42. I spent €24 and my friend spent €18. How much money did we have left together?

_____

_____

_____

e) Josh played 3 games on his computer. His scores were 174, 190 and 125. What was his total score?

_____

_____

_____

2. How much is shaded? Write the fractions.

$\dfrac{1}{6}$

$\dfrac{}{}$

$\dfrac{}{}$

$\dfrac{}{}$

$\dfrac{}{}$

$\dfrac{}{}$

$\dfrac{}{}$

$\dfrac{}{}$

$\dfrac{}{}$

$\dfrac{}{}$

$\dfrac{}{}$

$\dfrac{}{}$

$\dfrac{}{}$

$\dfrac{}{}$

$\dfrac{}{}$

$\dfrac{}{}$

4. Solve and shade in.

$\frac{1}{4}$ $+$ $\frac{2}{4}$ $=$ $-$

$\frac{2}{3}$ $-$ $\frac{1}{3}$ $=$ $-$

$\frac{1}{4}$ $+$ $\frac{1}{4}$ $=$ $-$

$\frac{3}{4}$ $-$ $\frac{1}{4}$ $=$ $-$

$\frac{1}{3}$ $+$ $\frac{1}{3}$ $=$ $-$

$\frac{4}{8}$ $-$ $\frac{2}{8}$ $=$ $-$

M. Addition, Subtraction, Multiplication and Division of Decimal Numbers

1. Read about decimal numbers.

- A decimal number (based on the number 10) has a decimal point.

- Look at the number 45.6

- It is "forty-five and six-tenths" or "forty-five point six"
- The decimal point goes between the **Units** and **Tenths**

Look at the example: 482.781

Decimal Point

Thousands	Hundreds	Tens	Units	Tenths	Hundredths	Thousandths
	4	8	2	7	8	1

- As we move left, each position is 10 times bigger!
- For example, **Tens** are 10 times bigger than **Units**
- **Hundreds** are 10 times bigger than **Tens**

... and ...

As we move right, each position is 10 times smaller!

2. Write the place and value of each number.

a. 6̲79,658.57

What place is the selected digit in? _____

What is the value of the selected digit? _____

b. 524,424.8̲1

What place is the selected digit in? _____

 What is the value of the selected digit? _____

3. Look at the number and answer the questions.

134.97

a. Which digit is in the 10's column? _____

b. Which digit is in the $\frac{1}{10}$'s column? _____

c. Which digit is in the 1's column? _____

d. Which digit is in the 1,000's column? _____

e. Which digit is in the $\frac{1}{100}$'s column? _____

f. Which digit is in the 100's column? _____

4. Look at the number and answer the questions.

1038.572

a. Which column is 8 in? _____

b. Which column is 3 in? _____

c. Which column is the 5 in? _____

d. Which column is the 2 in? _____

e. Which column is 1 in? _____

f. Which column is 7 in? _____

Which column is 0 in? _____

O. Calculator Skills

1. Add these numbers using your calculator:

   Forty-three, One hundred and fifty-six, Eighty-six, Two hundred and seven, Ninety, Seven hundred and five, Eighteen, Three hundred and twelve, Thirty-nine, Six thousand, One hundred and forty, Fifty-seven

   _____

2. Use your calculator to work out the following: (Remember that units must be the same!)

   a. €6.25 + 85c = _____

   b. 8.47m + 67 cm = _____

   c. €5.03 – 8c = _____

   d. 6 1.5 kg – 263 g = _____

3. Use your calculator to work out these answers – quickly and accurately!
   a. 4953 + 3958 = _____

   b. 3728 – 1946 = _____

   c. 39 x 37 = _____

   d. 4839 + 29384 + 3949 = _____

   e. 8 x 3 x 9 = _____

   f. 507 ÷ 39 = _____

   g. $2^2 + 3^2$ = _____

   h. 12% of 1200 = _____

Teacher Notes

Assessment Brief 2

Module Title: Application of Number
Module Code: 3N0928
Assessment Technique: Collection of work
**Title:** Measurement and Capacity

Guidelines:

You will be expected to:

1. Describe shape and space constructs using language appropriate to shape and space to include square, rectangle, circle, cylinder, angles, bisect, radius, parallel, perpendicular, etc.
2. Draw everyday objects to scale using a range of mathematical instruments.
3. Calculate the area of a square, rectangle, triangle, circle using the correct formula and giving the answer in the correct form.
4. Calculate the volume of a cylinder using the correct formula and giving the answer in the correct form.
5. Demonstrate metric measurement skills using the correct measurement instrument, and vocabulary appropriate to the measurement, to accurately measure length/distance, capacity, weight, time.
6. Use simple scaled drawings to work out real distance, location and direction.

Assessment Criteria:

- All calculations must be accurate to two decimal places.
- All working out must be shown.
- All worksheets must be clearly and neatly completed.
- The correct order of operations must be followed.
- Show the application of principal mathematical functions: addition,
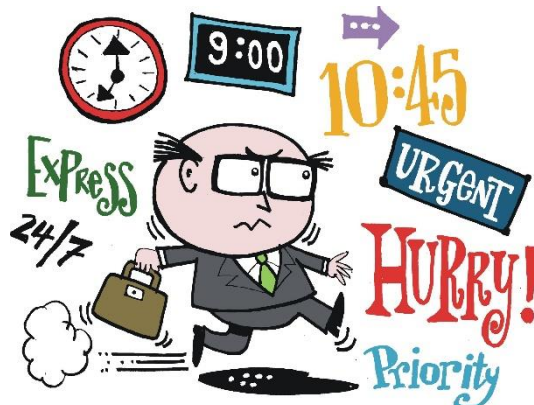
multiplication, subtraction and division.
- Use correct mathematical vocabulary.
- Drawings must be clear and have a suitable scale.

Date Brief issued: Submission Date:

I confirm that this is my own work.

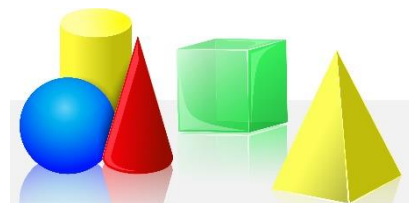Signed:_____
Date: _____

A. Properties of Shapes

1. Write the properties/key features of each of these shapes, using mathematical language.

Shape	Properties
Square	
Rectangle	
Circle	
Cylinder	
Triangle	
Cone	

Teacher Notes

2. Label the angles and lines:

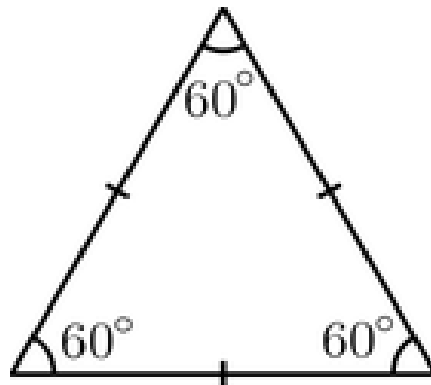|	
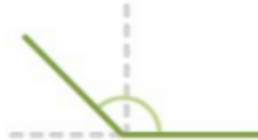
3. Shade in the angles.

4. Calculate the areas of these shapes, using the correct formula and giving the answer in the correct form: (Show your working but you can also use the calculator.)

a. The side length of a square is 9 km. Find its area.

_____

_____

_____

b. Find the area of this rectangle.

_____

_____

_____
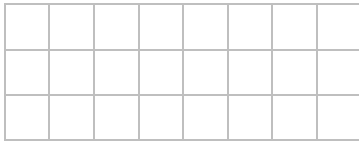
c. Calculate the area of the circle.
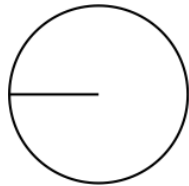
r = 9 m

_____

_____

_____

d. Calculate the area of the triangle.

6 cm
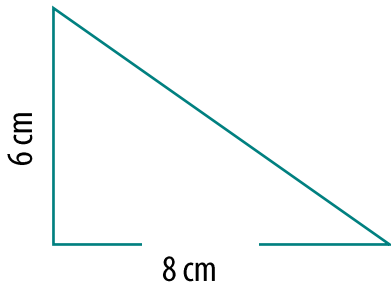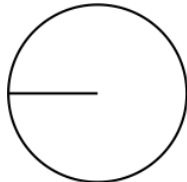
8 cm

_____

_____

_____

Formulae:

Area of a square:

L x L

Area of a rectangle:

L x B

Area of a circle:

π r^2

Area of a triangle:

½ base x height

e. Calculate the area of the circle.

r = 6 mm

_____

_____

_____

1. got your answer and use your calculator if you need it.

   a. An aeroplane flies with a constant speed of 600 km/h. How long will it take to travel a distance of 1800 kilometres?

   _____

   _____

   _____

   b. John walked 2 kilometres after work.   His friend Kevin cycled 3000 meters after work. Who went a greater distance and how much greater was it? (answer in km)

   _____

   _____

   _____

   c. Steven wakes up for work at 6:30 in the morning. If work starts at 9:00 am, how long does he have from the time he wakes up until work starts?

   _____

   _____

   _____

   d. I started watching a movie at 1:45 and it ended at 4:00. How long was the movie?

   _____

   _____

   _____

F. Scale

1. Look at this scale drawing of a bedroom:
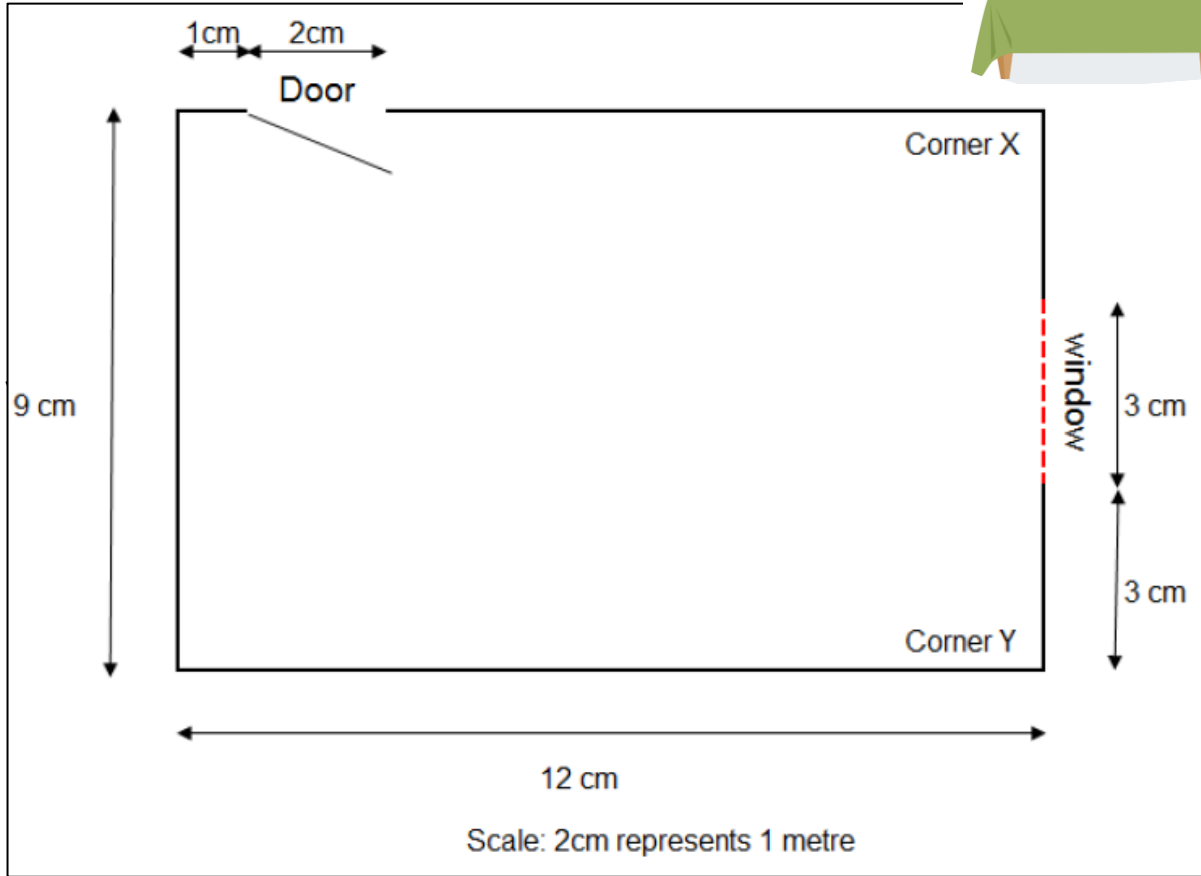
a. Write the scale.

_____

b. How wide is the bedroom in real life?

_____

c. How long is the bedroom?

_____

d. How wide is the window?

_____

e. Give everyday examples of when things are drawn to scale.

_____

_____

_____

A. Everyday Problem-Solving

1. Give at least 3 examples of everyday situations where maths can be used to solve problems.

_____

_____

_____

_____

_____

_____

_____

_____

_____

2. Look at these examples. Discuss them as a group. Make notes if you wish:

a. There are 21 students going on a tour of Croke Park. The cost is €12 per student for the bus, €8 per person for the tour and €9.50 for the lunch. How much money does the tutor have to collect from the students altogether?

_____

_____

_____

_____

b. Maggie had 2 boxes of eggs, with 6 eggs in each box. She used 3 eggs at breakfast time, and she used 4 eggs baking a cake. She needs 6 eggs for dinner. Does she need to buy more eggs?

_____

_____

_____

_____

c. An online maths class begins at 9:15 a.m. It lasts for 4 hours and 30 minutes. At what time will the class end?

_____

_____

_____

_____

d.   Lorraine looked at her car's odometer before a trip. She had to travel 512.3 kilometres. When she stopped for lunch, the odometer showed that she had travelled 372.2 km. How much further did she have to travel?

_____

_____

_____

_____

Mapping of Learning Outcomes

Learners will be able to:

Number

1.1   Explain the concept of natural numbers (N), integers (Z), and real numbers (R) Pages 7 to 10 (number systems), Pages 11 to 15 (place value)

1.2   Demonstrate equivalence between common simple fractions, decimals, and percentages by conversion Pages 85 to 92 (equivalence of common simple fractions, decimals and percentages)

1.3   Use a calculator to perform operations requiring functions such as +, -, ×, ÷, memory keys and clear key Pages 82 to 84 (calculator skills), throughout the course to check answers

1.4   Give approximations by using strategies including significant figures and rounding off large natural numbers Pages 16 to 28 (rounding off), Pages 29 to 30 (estimation), Pages 31 to 33 (significant figures), Page 34 (rounding general)

1.5   Demonstrate accuracy of calculation by applying the principal mathematical functions i.e. +, -, ×, ÷, natural numbers (N) and integers (Z), common simple fractions, and decimal numbers to two places of decimal Pages 35 to 41 (addition and subtraction of natural numbers), Pages 42 to 49 (multiplication and division of natural numbers), Pages 50 to 53 (mixed operations), Pages 54 to 58 (fractions), Pages 59 to 65 (mixed operations – fractions), Pages 66 to 70 (mixed operations – integers), Pages 71 to 77 (mixed operations – decimal numbers), Pages 78 to 81 (order of operations)

Measurement and Capacity

2.1   Describe shape and space constructs using language appropriate to shape and space to include square, rectangle, circle, cylinder, angles, bisect, radius, parallel, perpendicular Pages 96 to 99 (language of shapes), Pages 100 to 102 (properties of shapes)

2.2   Draw everyday objects to scale using a range of mathematical instrument   Pages 129 to 132 (drawing objects to scale)

2.3   Calculate the area of a square, rectangle, triangle, circle, by applying the correct formula and giving the answer in the correct form Pages 103 to 110 (area of square, rectangle triangle, circle)

2.4   Calculate the volume of a cylinder by applying the correct formula and giving the answer in the correct form Page 111 (volume of a cylinder)

2.5   Understand simple scaled drawings by working out real distance, location and direction   Pages 124 to 128 (scale)

2.6   Demonstrate metric measurement skills using the correct measurement instrument, and vocabulary appropriate to the measurement, to accurately measure length, distance, capacity, weight, time Pages 112 to 123 (measurement skills)

2.7   Calculate solutions to real life quantitative problems by applying the appropriate mathematical techniques to a variety of everyday situations and discussing the results to include budgets, costings, time, quantity etc. Pages 135 to 136 (everyday problem solving), Pages 137 to 139 (finding solutions), Pages 140 to 143 (solving other problems), Pages 144 to 154 (general problem solving), throughout the course