Kilburn Junior School

Mathematics Policy

Summer 2023

EMBARK Federation

KILBURN JUNIOR SCHOOL

Embark Federation

May 2023

Kilburn Junior School: Mathematics Policy 2023

1. RATIONALE

1.1 At Kilburn Junior School, Mathematics is viewed as a creative and highly inter-connected discipline that is essential for everyday life and for success (almost universally) in the world of work. A high-quality mathematics education, therefore, provides the foundation for pupils to understand the world around them. A sound grasp of Mathematics is critical to understanding a variety of disciplines such as science, technology, computing and engineering and can give structure to abstract concepts in such pursuits as art and music. Without having a sound grasp of Mathematics, children will be denied this language with which to understand, unlock and quantify their experiences of the world.

1.2 This policy describes our values and philosophy in relation to meeting the needs of all mathematical learners at Kilburn Junior School. It outlines the framework within which all staff work and gives guidance on planning, teaching and assessment. It is designed to describe how the school intends to meet the needs of mathematics learners of all ages.

1.3 The policy is intended to be read in conjunction with the calculation policy which illustrates strategies and methods outlined in the national curriculum which are taught from year 3 to year 6.

2. AIMS AND OBJECTIVES

2.1 The national curriculum for mathematics (2014) aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **reason** mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

2.2 It is essential that in each area of the curriculum (Number, Measurement, Geometry and Statistics) children are given the opportunity to thoroughly practice each of the above aspects of their mathematical learning and, in doing so, it is our firm belief that the children will develop a mastery of the concepts covered, develop motivation, and be fully prepared to confidently transition into Key Stage 3.

3. SPOKEN LANGUAGE

3.1 The national curriculum for mathematics reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof. They must be assisted in making their thinking clear to themselves as well as others and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

3.2 The variety and scope of the vocabulary that it is essential to try to instil in the children is set out clearly in the NCETM document *Mathematics glossary for teachers in Key Stages 1 to 3*. We have also included this

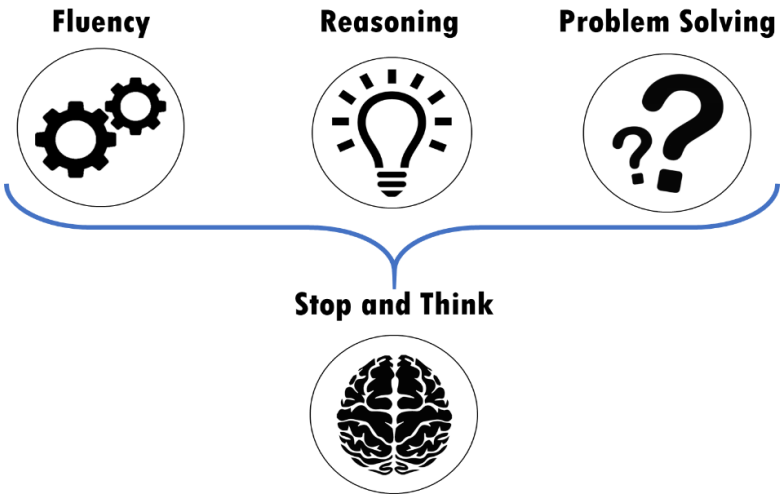
vocabulary in the Inspire Skills document. This vocabulary was then shared and quality assured through a work group comprising of maths leads from across the Embark MAT.

3.3 The vocabulary that children will be focussing on for each lesson will be displayed alongside the intended learning outcomes for the lesson[1] and other appropriate locations for the children to access and to use to support their spoken interactions with the teachers and their peers. The teaching staff will endeavour to make this vocabulary as specific and as accurate as possible.

4. PLANNING AND TEACHING MATHEMATICS

4.1 At Kilburn Junior School, it is essential that we teach units of work that provide the children with a rich diet of activities that will encourage them to develop **FLUENCY**, **PROBLEM SOLVING**[2] and **REASONING**[3] skills within each unit of work. Units should be allocated sufficient time for the children to develop skills, reason about the concepts they have become fluent in and apply these skills to solve problems. This is essential in all areas of the mathematics curriculum and not just number work.

4.2 In planning a series of lessons, it is essential that an appropriate weighting of time be devoted to sufficiently allow the children the opportunity to develop all three of these approaches to each intended learning outcome.



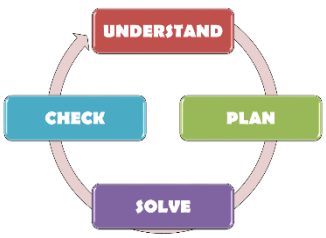
4.3 At Kilburn Junior School, we believe that through the thorough teaching of **FLUENCY**, **PROBLEM SOLVING** and **REASONING**, the children in our school will develop *mastery* within the separate fields of mathematics.

4.4 Underpinning the **FLUENCY**, **PROBLEM SOLVING** and **REASONING** tasks that we deliver to the children are our **STOP AND THINK**[4] style tasks. These are activities that encourage the children to think about their own thought processes and those of others. These metacognitive tasks encourage critical thinking by the pupils in order to assess the methods used by themselves and others to see if strategies can be improved in the short term or 'magpied' and employed in the future for similar problems. These tasks help children to plan, monitor and evaluate their learning whilst improving their motivation to learn.

4.5 Problem solving generally refers to situations in which pupils do not have a readily-available method that they can use. Instead, they have to approach the problem flexibly and work out a solution for themselves. To succeed in this, pupils need to draw on a variety of problem-solving strategies which enable them to make sense of unfamiliar situations and tackle them intelligently.

4.6 A problem-solving strategy is a general approach to solving a problem. The same general strategy can be applied to solving a variety of different problems. For example, a useful problem-solving strategy is to identify a simpler but related problem. Discussing the solution to the simpler problem can give insight into how the original, harder problem may be tackled and the underlying mathematical structure. A strategy is different from an algorithm, which is a well-established sequence of predetermined steps that are executed in a particular order to carry out a commonly-required procedure.

4.7 When problem solving, children are encouraged to view the process in four stages: 'understand', 'plan', 'solve' and 'check'. In following these four steps, children are taught strategies to support their problem solving within each of the stages. Underpinning all of the four stages of the problem solving cycle, is



[1] See appendix 1.
[2] See appendix 2 for example questions.
[3] See appendix 3 for example questions.
[4] See appendix 4

the ability to read and comprehend written language. This is taught throughout the curriculum and plays as important a role in Mathematics as it does in any other subject.

4.8 To support the 'understand' phase of the problem solving cycle, children are taught a variety of methods to engage with problems independently. Within the understanding phase, children are encouraged to use one of six methods to explore the question, visualise the mathematics underlying the problem and abstract unnecessary detail. These six strategies are: sketches and accurate drawings, formulating number sentences, trial and error; bar models, number lines and tabulating relevant information. These strategies are referred to as 'The Super Six'[5] and are displayed in the classrooms and referred to by staff. These strategies are useful the vast majority of the time, to enable children to understand the problem they face in maths but this list is not exhaustive and other strategies will be encountered throughout the course of the academic year.

4.9 As a school, we believe that all students, when introduced to a key new concept, should have the opportunity to build competency in this topic through the use of a ***CONCRETE, PICTORIAL, ABTRACT*** approach. In doing so, the child can be allowed to build.

- **CONCRETE** – students should have the opportunity to use concrete objects and manipulatives to help them understand what they are doing.
- **PICTORIAL** – students should then build on this concrete approach by using pictorial representations. These representations can then be used to reason and solve problems.
- **ABSTRACT** – with the foundations firmly laid, students should be able to move to an abstract approach using numbers and key concepts with confidence.

4.10 The aim is to use manipulatives and representations to reveal mathematical structures and enable pupils to understand and use mathematics independently; however, Manipulatives should act as a 'scaffold', which can be removed once independence is achieved. Before using a manipulative, it is important to consider how it can enable pupils to eventually do the maths without it.

4.11 Calculators should not be used as a substitute for good written and mental arithmetic. They should therefore be introduced when the intention is to support pupils' conceptual understanding and exploration of more complex number problems or to reduce cognitive overload when exploring concepts where arithmetic is not the focus of the lesson. Teachers should use their judgement about when ICT tools should be used to enhance or support teaching and learning.

4.12 The teaching of mental calculation strategies should be progressive and provide the children in the school with a variety of skills which they are able to critically evaluate and employ to support their work across the curriculum. The document ***Assessment at Kilburn Junior School*** sets out clearly the expectations for the teaching of mental calculations in all year groups in line with the DfE ***Teaching Children to Calculate Mentally*** document.

4.13 Where possible, children should be given the opportunity to practice their mathematical skills in other areas of the curriculum. At Kilburn Junior School, we aspire to show the same level of care and attention to the study of mathematics in these cross-curricular activities as we do in the discrete lessons themselves. Indeed, it can be far more beneficial to the children's learning if certain concepts are contextualised in a cross-curricular way. For example, 'range' may have more meaning to a child if put into the context of a science investigation into insulation of heat.

[5] See appendix 5

5. TEACHING FOR MASTERY

Teaching for mastery is characterised by:

5.1 The use of variation theory. **Variation theory** has several dimensions, including use of multiple representations of what a concept is, and what it is not. It is characterised by a carefully constructed small-step journey through the learning, paying attention to what is kept the same and what changes, in order that pupils might reason - make connections and build deep conceptual knowledge. Variation is applied to practice questions where attention is paid to the selection and order of the examples, often changing just one aspect whilst keeping others the same. The intention is to avoid mechanical repetition but instead to promote thinking to make connections. This is also known as 'intelligent practice'.

5.2 A belief that, by working hard, **all children are capable of succeeding at mathematics**. On this basis, children are taught all together as a class and are not split into 'ability' groupings. As teachers of mathematics, we aim for **integration** in our lessons through **adaptation, scaffolding and modification**. Carefully chosen resources, questioning and scaffolds allow the children within the class to work on similar areas of the curriculum without capping the attainment of children with perceived lower abilities. All children should be taught to identify (with support from an adult) where they can push themselves onto more challenging work or where they might need to take a small step back to build their understanding of concepts. Carefully structured teaching, planned in small steps provides both the necessary scaffold for all to achieve, and the necessary detail and rigour of all aspects of the mathematics to facilitate deep thinking. The small steps are connected and concepts built, leading to generalisation of the mathematics, and the ability to apply it to multiple contexts and solve problems. It is expected that those that will achieve well on a particular topic may not necessarily be the same children that achieved well on other topics. Additional short sessions or intervention from the class teacher or teaching assistants can then be targeted for any pupils who do not fully grasp the lesson content, in order that they 'keep up' with the class. Our experience shows that it is not always the same pupils who require this form of intervention and this boosts the self-belief of previously low attaining pupils.

> *The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage.* ***Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content.*** *Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.*
>
> - National Curriculum in England: Mathematics Programmes of Study

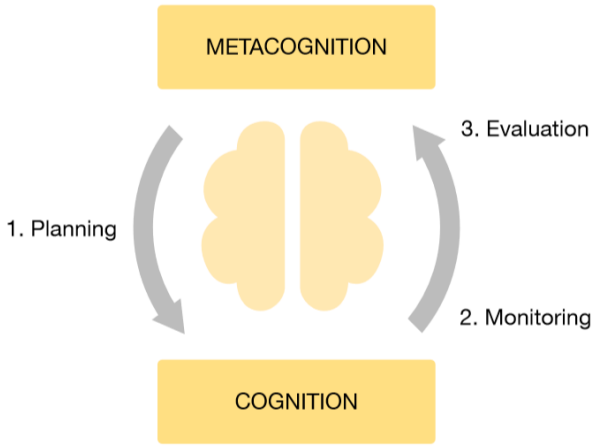
5.3 The structure of the work that children will undertake in each year group has been taken from the **White Rose** 'New Schemes' to effectively structure the small steps that will enable pupils to achieve the aims and ambition of the curriculum, in coherently planned and sequenced units of work.

5.4 A focus on exposing the **structure of mathematics** and developing an understanding of how and why mathematics works. A key skill of the teacher is to be able to represent the mathematics in ways that provide access and insight for pupils. Concrete materials, contexts, drawings, diagrams, equations all play a role. These are discussed through opportunities for pupil-pupil and pupil- teacher talk, to develop reasoning, flexibility and adaptability in mathematical thinking.

5.5 **Memorisation and repetition** of key facts (times tables and number bonds etc...) as important aspects of learning. Evidence from cognitive science research suggests that learning key facts to **automaticity** 'frees up' working memory to focus on more complex problem solving rather than reaching cognitive overload trying to calculate simple operations. In terms of procedural fluency and conceptual understanding, one should not be prioritised over the other, but learning is most effective when the two are fully integrated.

5.6 Teaching children **precise mathematical language** and insisting upon its use, to support children's ability to think mathematically. Having the language and using it, empowers children's ability to think about the concepts.

5.7 Our teaching aims to support **metacognition** and **self-regulated learning** in school by encouraging children to reflect on their learning in collaborative groups so that learners can support each other and make their thinking explicit through discussion. The work that children undertake is designed to support metacognition by encouraging them to monitor and evaluate their thinking, applying tried and tested methods to new, similar problems.



5.8 A key aspect of encouraging children to monitor and evaluate their learning is through **teacher modelling.** This could be done verbally, demonstrated on a white board, in books, or in writing prior to the lesson on a handout[6]. In this way, children have the benefit of seeing how an experienced mathematician plans, monitors and evaluates their learning.

6. ASSESSMENT OF MATHEMATICS

6.1 Assessment should be used not only to track pupils' learning but also to provide teachers at Kilburn Junior School with information about what pupils do and do not know. This information allows teachers to adapt their teaching so it builds on pupils' existing knowledge, addresses their weaknesses, and focuses on the next steps that they need in order to make progress.

6.2 Teachers' knowledge of pupils' strengths and weaknesses is used to inform the planning of future lessons and the focus of targeted support.

6.3 A variety of assessment methods are used to build a picture of the children's learning. Formal tests can be useful here, although assessment can also be based on evidence from low-stakes class assessments, informal observation of pupils, or discussions with them about mathematics. A schedule of the different focuses and appropriate tests that we conduct to assess children's understanding and plan for future intervention can be found in the document ***Assessment at Kilburn Junior School.***

6.4 Pupils' work will be marked in line with the ***Marking Policy*** and will model how corrections should be made, giving pupils a chance to learn from their misconceptions or incorrect methods.

6.5 Summative assessments are made at least once per term, six times per academic year and logged on iTRACK. These teacher assessments are based on the evidence from formative and summative assessments made by the class teacher. The mathematics subject co-ordinator will organise moderation and standardisation activities to ensure the accuracy of the assessments being made by the class teachers.

7. PARENTAL SUPPORT AND HOMEWORK

7.1 We recognise that parents make a significant difference to the progress of pupils in maths and encourage this essential partnership.

7.2 Homework is used for the following purposes:

- To practice a skill.
- To learn something by rote such as times tables and formulae.
- To revise for a test.
- To explore a mathematical problem or question.
- To research a topic.

8. THE ROLE OF THE SUBJECT LEADER

The Subject Leader is responsible for improving the standards of teaching and learning in Mathematics through:

[6] See appendix 5 for teacher model examples.

8.1 Monitoring and evaluating mathematics:

- pupil progress and analysis of data three times per year
- provision of mathematics: ensuring the breadth and balance of the curriculum with clear and progressive steps taught.
- Mathematics in other areas of the curriculum
- the quality of the learning environment (teaching, displays and use of ICT)

8.2 taking the lead in policy development
8.3 auditing and supporting colleagues in their CPD
8.4 purchasing and organising resources
8.5 reporting to governors and SLT
8.6 guidance support and training for parents and carers
8.7 keeping up to date with recent Mathematics developments

9. THE EXPECTATIONS OF THE TEACHING STAFF

9.1 Teachers are aware of school policy and plan and teach lessons in keeping with its ethos
9.2 A yearly overview is used to ensure coverage of the expected curriculum and progression from year to year
9.3 Planning covers all Mathematics objectives throughout the year
9.4 Weekly plans are based on medium term planning and success criteria based on the most recent assessments
9.5 A4 Mathematics books with graph paper pages are used where relevant throughout the year (largely for fluency based activities)
9.6 A plain-paged A4 book is used to provide the children with freedom to be creative in their reasoning and problem solving activities
9.7 Skills taught in Maths are reinforced and embedded throughout all other areas of learning; this is evidenced in all appropriate work (esp. science, D&T etc...)
9.8 Topics offer children the opportunity to contextualise and apply discrete mathematics learning for a wide range of purposes
9.9 Guided group work is planned for and delivered
9.10 Learning Objectives, success criteria and key pieces of vocabulary are displayed in all lessons and are evident in books
9.11 Marking is directly linked to the Learning objective and Success Criteria in all lessons. (See feedback and Marking policy)
9.12 Assessment for Learning is used in classrooms.
9.13 The attainment and progress of pupils is tracked using iTrack
9.14 High quality displays are used to support teaching and celebrate the achievements of pupils

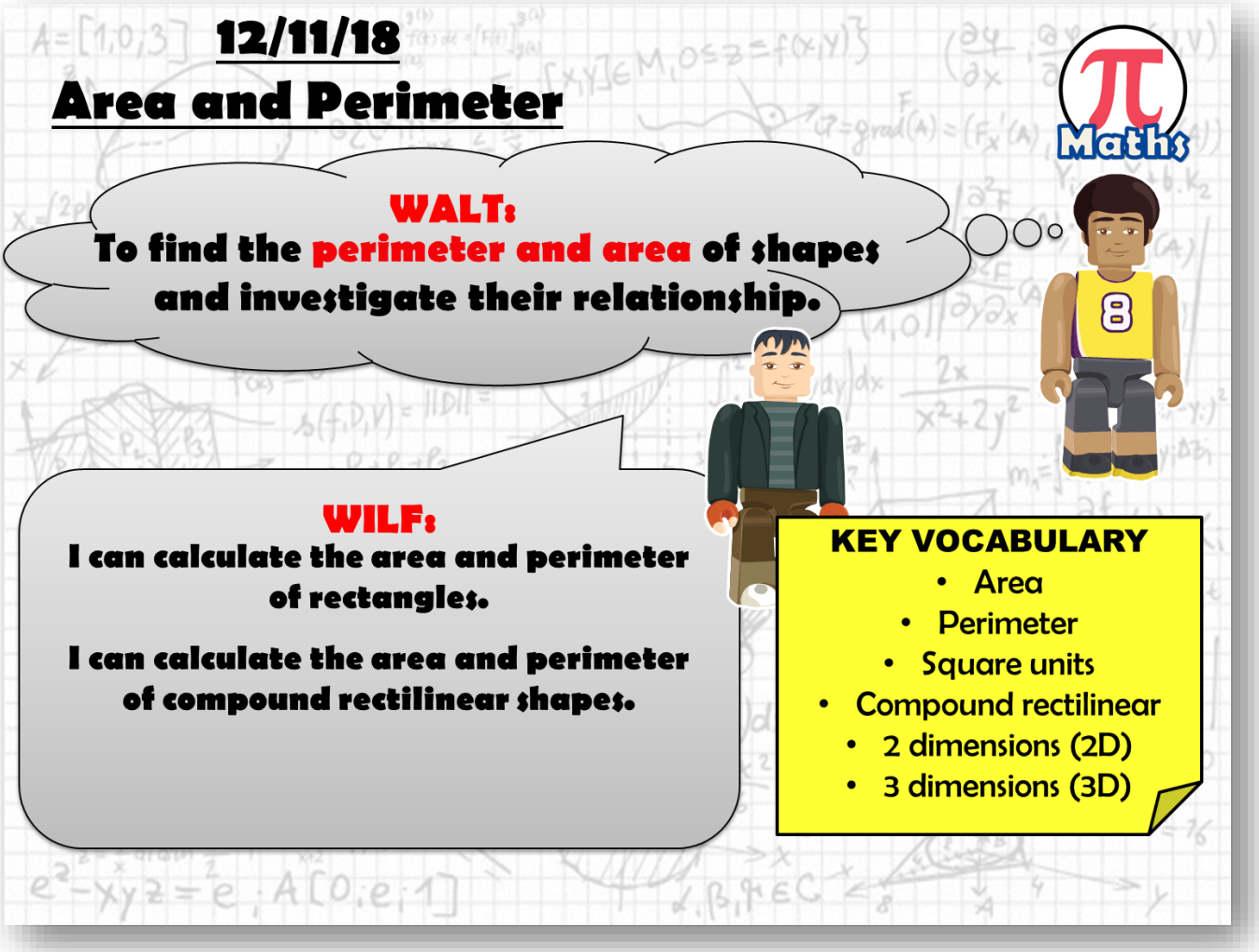
10. THE EXPECTATIONS OF TEACHING AND LEARNING ASSISTANTS AND OTHER HELPERS IN CLASS

10.1 All staff are aware of school policy and plan and teach lessons in keeping with its ethos.
10.2 Staff will feedback to teachers and pupils as necessary and in line with marking and feedback policy.
10.3 Staff will use mathematical vocabulary with accuracy and identify and correct misunderstandings or misconceptions in a timely manner.
10.4 Staff will model the high standards we expect from pupils and foster a love of mathematics through their own enthusiasm for the subject.


Good
MATHEMATICS
is not about how
many answers
you know...
It's how you
behave when you
don't know...

APPENDIX 1

(Display of vocabulary alongside learning objectives)



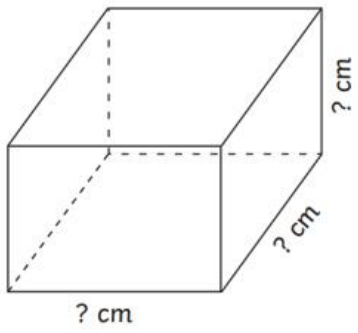
APPENDIX 2

(Examples of problem solving questions)

Deepest

1) A cuboid has sides that are whole numbers. No side is smaller than 3cm or longer than 10cm. It has a volume between $70cm^3$ and $75cm^3$.

Not drawn to scale



Find three sets of different dimensions for the cuboid.
(Rearranging the order of the measurements is not accepted as a different answer.)

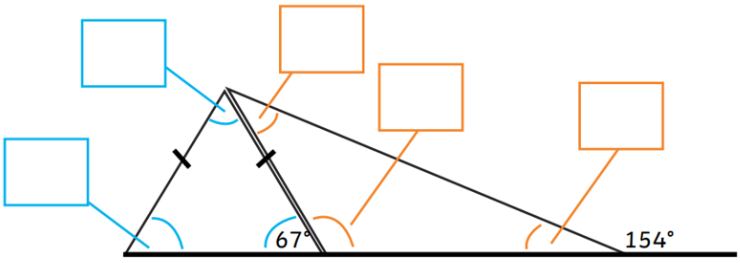
length = ____cm	length = ____cm	length =____cm
width = _____cm	width = _____cm	width =_____cm
height = ____cm	height = ____cm	height = ____cm
volume = _____cm	volume = _____cm	volume = _____cm

2) Three friends are sharing a bottle of lemonade. Selma drinks 35% of the bottle; Mia drinks $\frac{2}{5}$; Ruby drinks $\frac{3}{50}$. What percentage of the lemonade is left in the bottle when they have finished drinking?

APPENDIX 3

(Examples of reasoning questions)

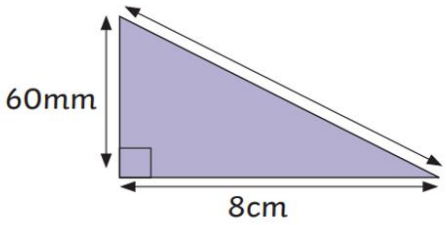
1) a) Circle the angle statements that you can use to help you calculate the missing angles in this shape.



Angles around a point = 360°.	Vertically opposite angles are equal.	Angles on a straight line = 180°.
Angles in a triangle = 180°.	A right angle = 90°.	Isosceles triangles have 2 equal angles.

b) Label the shape above with all of the missing angles.

2) Which of these calculations has correctly worked out the area of the triangle? Explain the errors made in the other calculations.



A $8 \times 6 = 48cm^2$

B $\frac{1}{2} \times 8 \times 6 = 24cm^2$

C $\frac{1}{2} \times 8 \times 60 = 240cm^2$

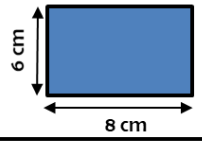
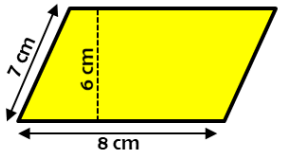
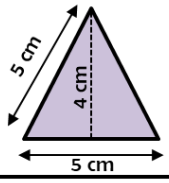
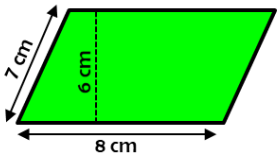
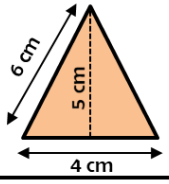
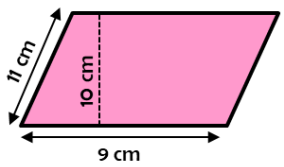
APPENDIX 4

(Examples of stop and think activities)

Date: _____ Name_____ Stop and Think

Area and Perimeter Misconceptions

For each of these questions, try to identify the misconception that has caused the pupil to get the wrong answer.

1) Calculate the perimeter.  	Answer $P = 14\,cm$	What went wrong?
2) Calculate the area.  	Answer $A = 56\,cm^2$	What went wrong?
3) Calculate the area.  	Answer $A = 20\,cm^2$	What went wrong?
4) Calculate the area.  	Answer $A = 30\,cm$	What went wrong?
5) Calculate the area.  	Answer $A = 12\,cm^2$	What went wrong?
6) Calculate the area.  	Answer $A = 45\,cm^2$	What went wrong?

Date: _____ Name _____

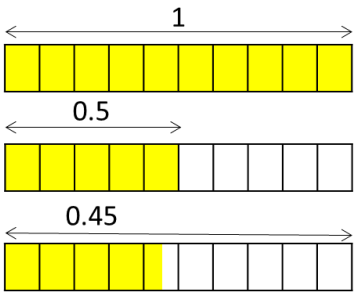
Using Models as Proof

Stop and Think

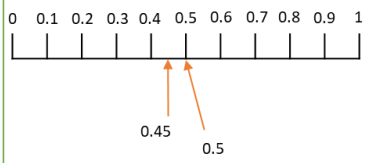
WALT: I can present convincing mathematical proof as evidence for a mathematical statement.

0.45 is greater than 0.5 because 45 is bigger than 5.

Model 1



Model 2



Model 3

U	.	t	h
0	.	5	
0	.	4	5

Choose which model you think is the best for correcting this boy's misconceptions and use it to explain why he is wrong.

Date: _____ Name _____

Stop and Think

Quality Explanations?

WALT: I can present convincing mathematical proof as evidence for a mathematical statement.

Rate each explanation out of 5 stars for problem 1 from yesterday's activity. Comment on each with two good things about the explanation and one thing that could be improved.

Nina's coordinate is wrong but her plot is correct. Her coordinate is wrong because she didn't follow the rule down the hall and up the stairs. The real coordinates are (1,3), (1, -2) and (5, -2).

Nina is wrong because she got the y and the x axis the wrong way round. The real coordinates are vertex a (1, 3), vertex c (1, -2) and vertex b (5, -2). I have drawn her triangle with her coordinates.

She has got the right idea but she got the axes mixed up. She needs to learn 'bottoms up'.

Date: _____ Names _____ Stop and Think

Rate My Question

WALT: I can present convincing mathematical proof as evidence for a mathematical statement.

Question 1

Claire is given the calculation below to estimate an answer to:

1,912 + 1,888 = ??

Claire says "I will just double 1,900 which is 3,800."

Why has Claire done that? Would you do anything differently?

Question 2

DO THEN EXPLAIN: Find out the populations of these five countries: the UK, France, India, USA and China.
Order the populations starting with the largest.
Explain how you ordered the countries and their populations.

Question 3

Put a number in the missing space below to make the sentence correct.

4_236460 > 46236460

Is there another option?
Explain how you it is correct.

Heaven!

The easiest question is number ____ because...

Hell!

The hardest question is number ____ because...

Date: _____ Names _____ Stop and Think

Making Connections

WALT: I can use efficient methods to help me to solve problems and reason about mathematics.

Two friends are working on different problems in maths...

We should work together, our problems are sort of similar.

I don't think that will help us. The problems are nothing alike!

Solve these two different problems and see if there is any similarity.

ALGEBRA 3

Problem Solving

a and b stand for whole numbers.
a + b = 1000 and a is 150 greater than b.
Work out the possible values of a and b.

AREA 4

Problem Solving

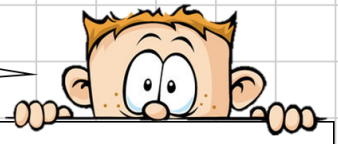
A rectangle has an area of 24 cm^2.
This is expressed through the equation l x w= 24 cm^2.
What could l and w stand for? Draw the rectangles to prove you are correct.

Date: _____ Names _____ Stop and Think

What's Going on Here?

WALT: I can present convincing mathematical proof as evidence for a mathematical statement.

Use the space next to the different stages of the calculation to explain what is happening at each step.



	0			
4	~~3~~ 3	3	2	

	0	8		
4	~~3~~ 3	3	2	
	(32)			

	0	8		
4	~~3~~ 3	3	1 2	
	(32)			

	0	8	3	
4	~~3~~ 3	3	1 2	
	(32)			

Name _____ Date _____ Stop and Think

Written Division

Before we look at this topic, show me what you know! Can you solve these calculations?

1) 4 | 9 4 4

2) 5 | 7 1 3

3) 8 | 8 6 3 8

4) 1 7 | 7 3 1

What can you do?

Find Integer Answers ... ☐

Find Remainders …….. ☐

Find Decimals …….. ☐

HTU ÷ TU…….. ☐

How confident are you?

☆☆☆☆☆

Which piece of work do you need to start with today?

APPENDIX 4

(Examples of different types of teacher modelling)

N.B. examples are intentionally left incomplete or containing errors for the children to demonstrate interaction with the models.

REASONING

Worked Examples

Year 6 (_/_/_)
Difficulty: ❸

ORDER OF OPERATIONS

Reasoning

Choose operations to go in the boxes to make the number sentences true.

① 6 [X] 8 [−] 4 = 44 ← the correct operations!

② 6 [ ] 8 [ ] 4 = 8

BOMDAS

How can I get the correct operations? Trial and error!

① 6 + 8 + 4 = 18 ×
6 + 8 × 4 = 38 ×
6 × 8 + 4 = 52 ×
6 × 8 − 4 = 44 ✓

② * These already show answers that are not 8!
6 + 8 − 4 = 10 ×
6 + 8 ÷ 4 = 8 ✓

Year 6 (_/_/_)
Difficulty: ❸

ORDER OF OPERATIONS

Reasoning

What is the difference between the following calculations?

1) 15 + 6 x 4 =
2) (15+6) x 4 =

BOMDAS

What are the stages?
① Find totals
② Subtract totals.

① 15 + 6 × 4 =
15 + 24 = 39

② (15+6) × 4 =
21 × 4 = 164

20 × 4 = 160
1 × 4 = 4

$$\begin{array}{r} {}^{5}1{}^{1}64 \\ -\ 39 \\ \hline 125 \end{array}$$

The difference between the two calculations is 125.

PROBLEM SOLVING

Worked Examples

Year 6 (_/_/_)
Difficulty: ❸

ORDER OF OPERATIONS

Problem Solving

How many different totals can you make using the following three numbers. You can only use each number once but you can place them in any order and use any mathematical symbols in between the digits.

2 6 7

What symbols could I use?
x ÷ + − ( )

How many different ways can I order the 3 numbers?

267
276 (6 combinations)
762
726
672
627

+

2+6+7 = 15
2+7+6 =
7+6+2 =
7+2+6 =
6+7+2 =
6+2+7 =

} 1 total!

−

7 − 6 − 2 = −1
6 − 7 − 2 = −3
2 − 6 − 7 = −11

x

7 x 6 x 2 = 84

Only one total for multp.

Combination and +

26+7 = 33
2+67 = 69 } same.
27+6 = 33
72+6 = 78 } same.
7+62 = 69

Year 6 (_/_/_)
Difficulty: ❹

ORDER OF OPERATIONS

Problem Solving

The mass of a box of chocolates is 550g.
The box contains 5 identical chocolates.

Martin eats 3 chocolates. The mass of the box is now 280g.
Find the weight of the empty box.

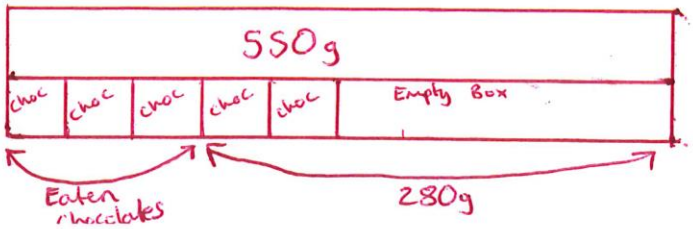
How can I represent the problem?
└ Bar model
└ calculation

Calculation

280 = 550 − (3 x □)

↑ Is this helpful? NO!

Bar model.



APPENDIX 5
(The Super Six)