Year 7

Mastery Detailed SOL
Autumn

MathsHUBS
White Rose

Year 7

Overview

One of the most frequent requests we get as a Maths Hub is for a suggested long term curriculum plan for mathematics at KS3. We have listened to what teachers need and the following mastery overviews have been developed by secondary practitioners in conjunction with the White Rose Maths Hub to provide a curriculum plan that will support 'Teaching for Mastery'.

There is a termly plan for each year group from Year 7 to Year 9; each term is split into twelve weeks. You will see from the overviews that a significant amount of time in Year 7 Autumn and Spring term is devoted to developing key number concepts. This is to build their fluency as number sense will affect their success in other areas of mathematics. Students who are successful with number are much more confident mathematicians.

We hope you find them useful. If you have any comments about this document or have any ideas please do get in touch.

The White Rose Maths Hub Team

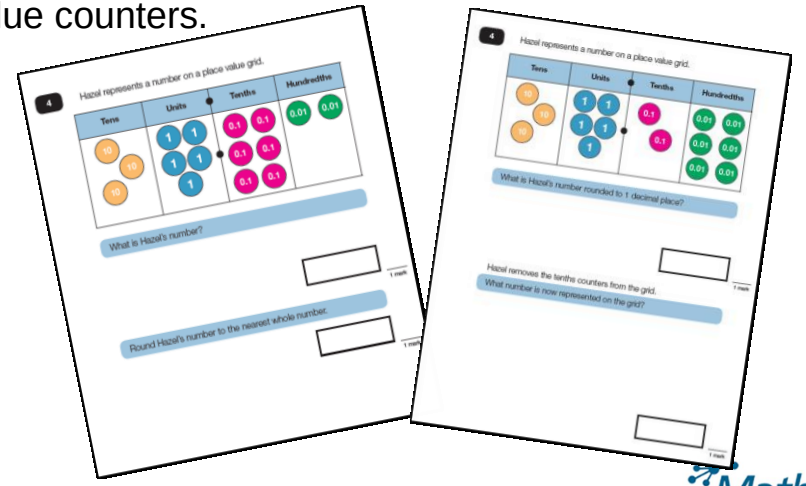
Assessment

Alongside these curriculum plans, our aim is also to provide an assessment for each term. There are two versions of the assessment:

Paper A: Support for lower attaining students
Paper B: For the core with appropriate challenge

You can use these assessments to determine gaps in your students' knowledge and use them to plan support and intervention strategies.

Our assessments are designed to test students understanding. They support teaching approaches such as bar modelling and using concrete materials to introduce topics. The example below shows a question from paper A and a question from paper B using place value counters.



mathshub@trinityacademyhalifax.org

MathsHUBS White Rose

Year 7

Teaching for Mastery

These schemes of learning are designed to support a mastery approach to teaching and learning and have been designed to support the aims and objectives of the National Curriculum.

The schemes of learning;

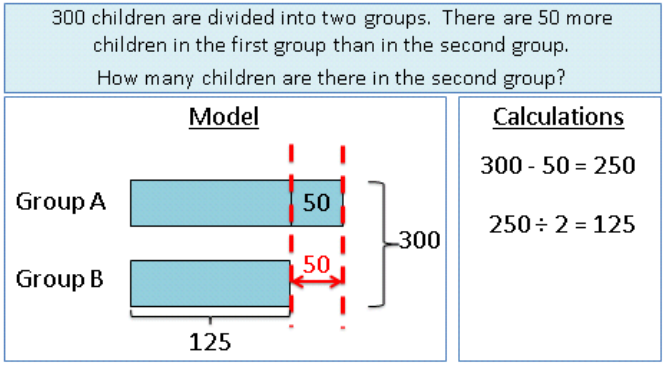
- have number at their heart. A large proportion of time in Year 7 is spent reinforcing number to build competency. Key number skills are then fed through the rest of the scheme so that students become more and more fluent.
- give teachers ideas for how to extend higher attaining students through depth rather than acceleration onto new content.
- ensure students have the opportunity to stay together as they work through the schemes as a whole group
- provide plenty of time to build reasoning and problem solving elements into the curriculum.

Concrete – Pictorial – Abstract

As a hub we believe that all students, when introduced to a key new concept, should have the opportunity to build competency in this topic by taking this approach.

Concrete – students should have the opportunity to use concrete objects and manipulatives to help them understand and explain 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.



An example of a bar modelling diagram used to 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.

mathshub@trinityacademyhalifax.org

MathsHUBS White Rose

Year 7

Frequently Asked Questions

Which assessment should we use?

Our Primary plans only include one assessment per term. However, we made the decision to include two at Secondary to help address already existing gaps in knowledge. The majority of students should aim for paper B. Paper A can be used for students who need more support. It does not omit any of the content, it is just more accessible; using simpler numbers or guiding them through the question a little more.

Is this scheme really suitable for all? What about very low attainers or very high attainers?

We firmly believe as a Hub that all students can achieve in mathematics. The scheme may be challenging for some, however we feel that the vast majority should be aiming for this standard. In extreme cases where students have considerable learning difficulties individual schools may want to put some alternatives in place.
In terms of high attainers, it is important that they fully understand key number concepts rather than memorise a process. This will reap its rewards looking into the future at GCSE and A level.

My students have completed the assessment but they have not done well. What are my next steps?

This is your call as a school, however our recommendation is that you would spend some time with the whole group focussing on the areas of the curriculum that they don't appear to have grasped. If a couple of students have done well then these could be given rich tasks and deeper problems to build an even deeper understanding. There is time built into the schemes for revising and improving key areas of the curriculum. Interleaving prior learning with new content is essential so that students can create links between different areas of maths. In addition recap starters and focussed homework are invaluable when consolidating prior learning.

Is it possible to compare data collected from the assessments with other schools?

Yes. There will be an option to share your data with us so that you can make comparisons with similar students.
Over time it will become easier to use this data to make predictions for success at GCSE. If you are interested in sharing your data with us, please contact the Maths Hub team.

mathshub@trinityacademyhalifax.org

mathshub@trinityacademyhalifax.org

MathsHUBS White Rose

Year 7

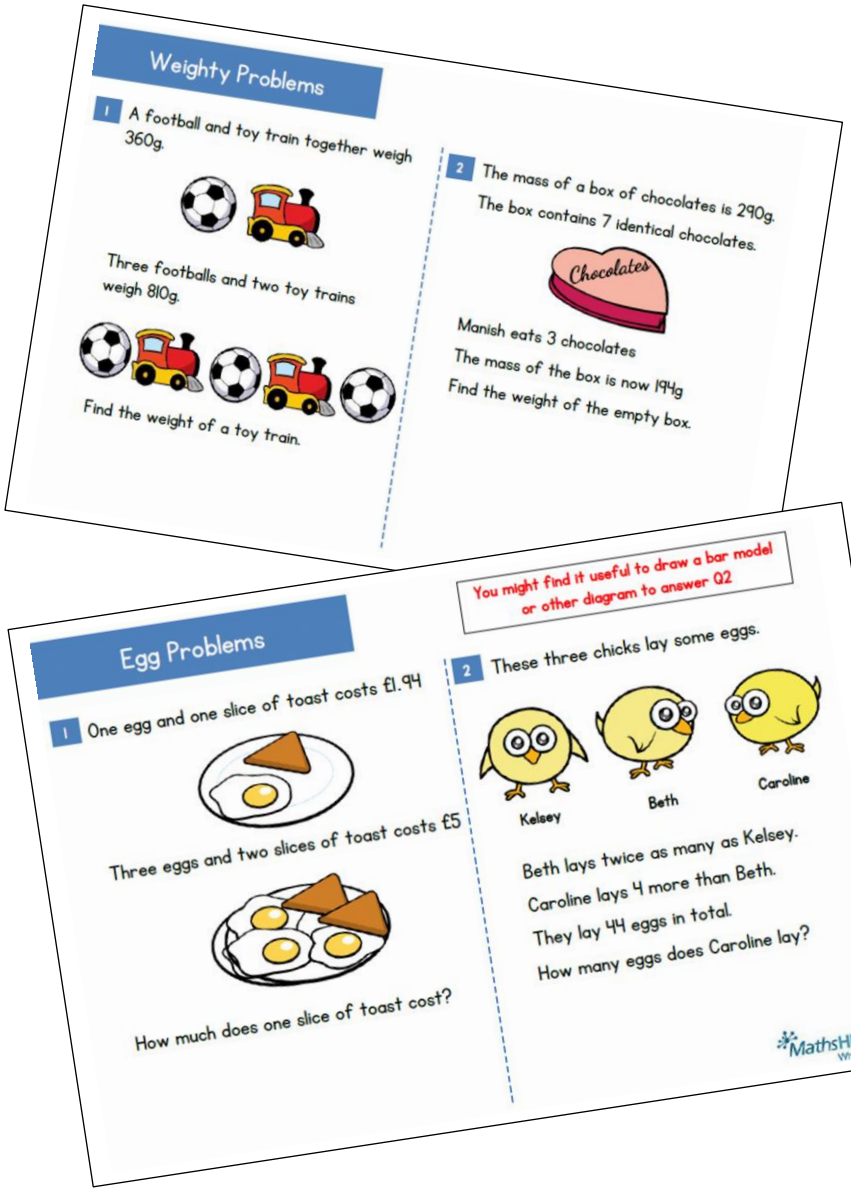
My students are already confident with number. Can we move through the scheme quicker or skip sections?

Timings are there as a guide as all schools and contexts are different, however we recommend that you follow the scheme at roughly the pace indicated. Check that students can apply their understanding of number in a variety of contexts and link different areas of maths with each other before moving on. Check that students can explain what they are doing and why using correct mathematical language. Ensure the class are not rushed due to a few very high attaining students. Could these students work on a project or investigation together while the majority of the class work at a slightly slower pace?

Here are some examples of some challenging problems. Check that students can answer problems like this independently and in a clear, concise way.

The full bank of questions can be downloaded here:

https://www.tes.com/teaching-resource/reasoning-and-problem-solving-questions-collection-ks1-and-ks2-11249968



mathshub@trinityacademyhalifax.org

MathsHUBS
White Rose

Year 7

We have followed your schemes of learning. Does this mean our students have mastered all the content?

Our schemes of learning support teaching for mastery, however following them does not guarantee mastery of the content.

Mastery of mathematics is a continuum. At each stage of learning students should be able to demonstrate a deep, conceptual understanding of the topic and be able to build on this over time. Mastery is not about just being able to memorise key facts and procedures, this tends to lead to a superficial understanding which can easily be forgotten.

A good indication of when a student has mastered content is when they can deal with questions that link multiple topics together. For example:

- Fractions with area, perimeter, collecting like terms, solving equations….
- Algebra with angles, area, perimeter, statistics…

Everyone Can Succeed

As a Maths Hub we believe that all students can succeed in mathematics. We don't believe that there are individuals who can do maths and those that can't. A positive teacher mindset and strong subject knowledge are key to student success in mathematics.

More Information

If you would like more information on 'Teaching for Mastery' you can contact the White Rose Maths Hub at mathshub@trinityacademyhalifax.org

We are offering courses on:

- Bar modelling
- Teaching for Mastery
- The subject specialism range - intensive courses, become a maths expert.

Our monthly newsletter also contains the latest initiatives we are involved with. We are looking to improve maths across our area and on a wider scale by working with the other Maths Hubs across the country.

mathshub@trinityacademyhalifax.org

MathsHUBS White Rose

Year 7

Year 7 Overview

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number - Place Value			Number - Addition & Subtraction			Number – Multiplication & Division					Revise & Improve
Spring	Number - Fractions 1						Statistics 1		Number – Negative numbers			Revise & Improve
Summer	Algebra 1						Geometry – Lines & Angles			Revise & Improve		

mathshub@trinityacademyhalifax.org

MathsHUBS White Rose

Term by Term Objectives

Year 7

Year Group	Y7	Term	Autumn

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Number: Place value Understand and use place value for decimals, measures and integers of any size. Order positive and negative integers, use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥ Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures]			Number- Addition & subtraction Use formal written methods for addition and subtraction of integers and decimals. Recognise and use relationships between addition and subtraction including inverse operations. Calculate and solve problems involving perimeter.			Number – Multiplication & division Multiply and divide by 10, 100 and 1000 Use formal written methods for multiplication and division of integers and decimals. Recognise and use relationships between operations including inverse operations. Understand the order of operations. Use the concepts and vocabulary of prime numbers, factors (or divisors), common factors and highest common factor (HCF). Use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations. Find the prime factor decomposition of a number. Calculate and solve problems involving area of rectangles, triangles and parallelograms. Calculate the mean average. Use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation $a<x\leq b$				Time at the beginning or end of the term for consolidation gap filling, seasonal activities, assessments, etc.

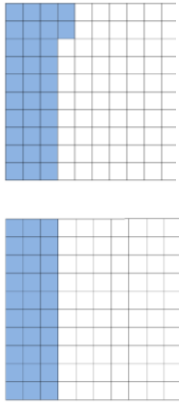
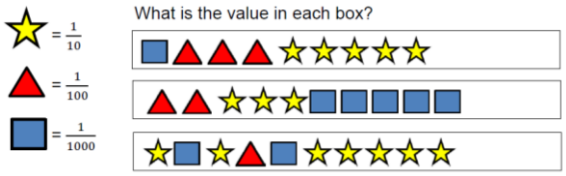
mathshub@trinityacademyhalifax.org

MathsHUBS White Rose

Term by Term Objectives

Year 7

Place Value

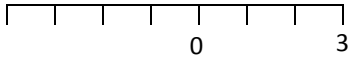
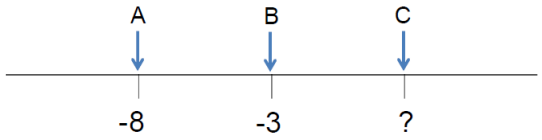
National Curriculum Statement	All students		
	Fluency	**Reasoning**	**Problem Solving**
Understand and use place value for decimals, measures and integers of any size. ❖ Read, write and understand the place value of integers of any size. ❖ Read, write and understand the place value of numbers with any number of decimal places. ❖ Represent and partition decimals in a variety of ways E.g 0.422 could be written as four tenths, two hundredths and two thousandths or four hundred and twenty two thousandths. ❖ Compare and order all of the above, using the symbols less than (<) and greater than (>)	• What is the value of the digit in bold in each case: **4**04 7,2**3**6 **2**,005,794 24.**8**6 300.00**3** • Write these numbers in words. 0.56 37.06 500.207 • Put the correct symbol (<, >, =) between these numbers. 4,576,902 ☐ 4,099,000 0.3 ☐ three tenths 1.5 million ☐ 150,000	• Lucy thinks that 1.422 is bigger than 1.43 because it has more digits. Is she correct? • Use these grids to compare the size of 0.32 and 0.3  Which decimal is smallest? What is the difference between the two numbers? Can you represent 0.55, 0.61 and 0.6 on hundred grids? Put them in size order. • Work out $\frac{3}{10}$ + 0.4 • Work out five tenths subtract 0.05	• Put the same number in each box to make the statement correct. 746☐ > 74☐9 • Put numbers in each box to make the numbers in descending order. 3☐17, 33☐5, 339☐, ☐764 • Use all the cards to make the smallest possible number. The largest possible number. How many numbers can you make that are less than 0.5? 6 5 4 • 0 • In this problem numbers have been replaced with symbols. 

mathshub@trinityacademyhalifax.org

MathsHUBS White Rose

Term by Term Objectives

Year 7

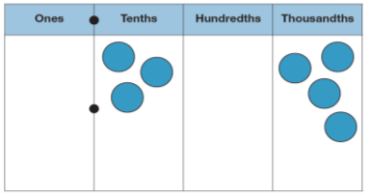
	National Curriculum Statement	All students		
		Fluency	**Reasoning**	**Problem Solving**
Place Value	Order positive and negative integers, use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥	• Complete the number line.  • Put these numbers in ascending order ○ 12, -2, 7, -3, -12 ○ -5, -11, -1, -6, -10 ○ -204, -205,-201,-200 • Put the correct symbol (<, >, =) between these numbers. -7 ☐ -6 -150 ☐ -151 3 ☐ -5	• Zain is counting forwards in threes. He starts at -17. Does he say 2? Explain your answer. • Alisha has put these numbers in order from smallest to largest. Is she correct? Explain your reasons. -10, -14, -19, -23 • Jenny is thinking of a number. Her number is: ○ Greater than -7 ○ Negative ○ An odd number ○ A one digit number What number could Jenny be thinking of? Write down all the possibilities. • ☐ + 5 ≥ 10 What is the biggest number you could fit in the box?	• Here are two number sequences. 8, 5, 2, -1, m, n, -10….. -9, n, p, 6….. Find the values of n, m and p. • Here is a number line.  The distance from A to B is the same as the distance from B to C. What is the value of C? • The difference between -5 and -9 = ▲ The number exactly half way between -1 and 5 = ■ -5 + 8 = ★ Work out ▲ × ■ × ★
	❖ Understand negative numbers in context. ❖ Compare and order negative numbers. ❖ Count forwards and backwards through zero.			

mathshub@trinityacademyhalifax.org

MathsHUBS White Rose

Term by Term Objectives

Year 7

	National Curriculum Statement	All students		
		Fluency	**Reasoning**	**Problem Solving**
Place Value	Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures] ❖ Round numbers to the nearest 10,100,1000, etc. ❖ Round to the nearest whole number. ❖ Round to any number of decimal places. ❖ Round to any number of significant figures.	• Round to 1d.p, 2d.p, 3d.p 50.7491 3.0509 41.99999 • Round to 1 sig. fig 15 93.6 20.999 • Round these numbers to 1 sig. fig then 2 sig. figs 254,000 1,376,877 • Estimate the answer to 9250 x 678 6.83 x 12.4 2999 ÷ 57	• A football stadium wants to do a quick mental estimate of how much money they will make if they sell tickets at £9.75 each. The stadium holds a maximum of 28,940 people. What calculation could they do to estimate how much money they will make from ticket sales? • Sal thinks that 3.999 to 2d.p is 3.10 because the 9's round up to 10. Is she correct? • Paul is thinking of a number. His number rounded to 2 sig. figs is 3700 What is the highest possible whole number he could be thinking of? What is the lowest possible whole number?	• Jamil uses counters to represent a number.  What is Jamil's number to 1 significant figure? He adds seven counters to the hundredths column. What is Jamil's new number to 1 decimal place? • Here are five cards. 85010 84599 95000 97410 89972 Complete the sentences …….rounded to 1 sig. fig is 80,000 …….rounded to 3 sig. fig is 85,000 • Two numbers each with 2 decimal places round to 41.3 to one decimal place. The total of the numbers is 82.6 What could the numbers be? How many different ways can you find?

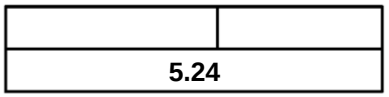
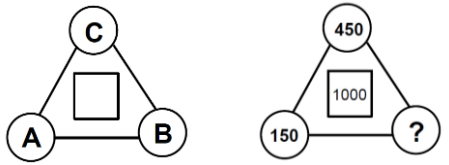
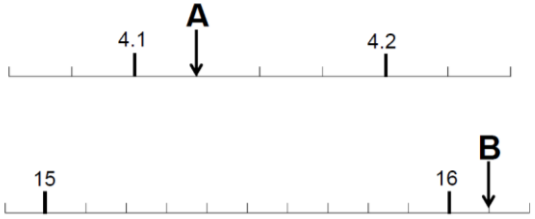
mathshub@trinityacademyhalifax.org

MathsHUBS White Rose

Term by Term Objectives

Year 7

Addition & subtraction

National Curriculum Statement	All students		
	Fluency	**Reasoning**	**Problem Solving**
Use formal written methods for addition and subtraction of integers and decimals. ❖ Add and subtract integers of any size. ❖ Add and subtract positive decimals greater than and less than one and with a different number of decimal places. ❖ Represent addition and subtraction with a variety of different concrete and pictorial methods e.g. bar models, part-whole diagrams. ❖ Solve problems, including missing number problems, using number facts, place value and more complex addition and subtraction.	• Work out $\begin{array}{r} 4 \cdot 4 5 \\ 1 \cdot 9 \\ +\ 0 \cdot 0 8 \\ \hline \end{array}$ $\begin{array}{r} 9 \cdot 0 7 \\ -\ 5 \cdot 6 \\ \hline \end{array}$ • Katie buys a drink for 59p and a sandwich for £1.18 How much does she spend in total? • Work out 328 + 20,640 1,800 miles – 699 miles 25.7kg + 0.9kg £102.63 – £10.09	• Abdul says "If I add any two 4 digit numbers together it will always make a 5 digit number." Do you agree? Explain why. • Here is a bar model  Select two numbers to make the model correct. • There are errors in the following calculations. Find the errors and correct them $\begin{array}{r} 4\ 3\ 5\ 2 \\ +\ 3\ 5\ 8 \\ \hline 7\ 9\ 3\ 2 \end{array}$ $\begin{array}{r} 5\ 3\ 4\ 9 \\ -\ \ 3\ 7\ 8 \\ \hline 5\ 0\ 3\ 1 \end{array}$	• Can you work out the missing numbers in these calculations? $\begin{array}{r} 5\ 8\ 1\ \square \\ +\ 1\ \square\ 9\ 6 \\ \hline \square\ 5\ \square\ 2 \end{array}$ $\begin{array}{r} 1\ 5\ \square\ 9 \\ -\ \ \square\ 8\ \square \\ \hline \square\ 2\ 2\ 0 \end{array}$ • The number in the square in the middle is calculated using the following rule A + B – C Can you find the number that would replace the question mark?  • Look at these number lines.  Find the difference between A and B.

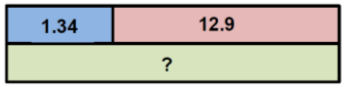
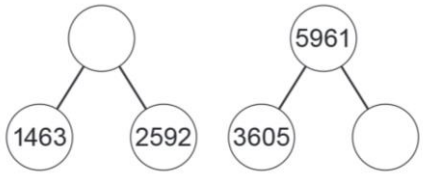
mathshub@trinityacademyhalifax.org

MathsHUBS White Rose

Term by Term Objectives

Year 7

Addition & subtraction

National Curriculum Statement	All students		
	Fluency	**Reasoning**	**Problem Solving**
Recognise and use relationships between addition and subtraction including inverse operations. ❖ Students should be able to answer questions where they need to perform an inverse operation involving the addition and subtraction of integers and decimals. ❖ Given a calculation students should be able to write the related facts. ❖ Show that addition can be done in any order (commutative) and subtraction cannot.	• Here is a bar model  Write down four relationships you can see in this bar model _____ + _____ = _____ _____ + _____ = _____ _____ - _____ = _____ _____ - _____ = _____ • ……+ 3902 = 7265 …… - 4632 = 9511 379 + 2742 = 479 + …….. • Molly has £540.67 in the bank. She buys her weekly shopping that costs £60.72 How much does Molly have left in the bank? **Show how you can check your answer using an inverse.**	• Nancy is using the inverse operation to solve calculations. She is completing the calculation below: _____ – 32.91 = 53.82 She says "I can turn the calculation around to get the correct answer." She does the following: 53.82 – 32.91 = Is she correct? Why? • Can you use five of the digits 1 to 9 to make this number sentence true. □□ · □ + □ · □ = 41.7 Can you find another five digits that would make the number sentence true? • □ - 555 = 8□5 What is the largest possible number that could fit in the rectangular box? What is the smallest? Convince me.	• Work out the value of A, B and C **15.6 + A = 50** **B + 39.1 = 50** **A + B + C = 50** • The two numbers in the bottom circles add to make the number in the top circle.  Work out the missing values. • All the digits below are either a 3 or a 9 Can you work out the value of each digit? 7338 = ???? + ???? How can you check that you are correct?

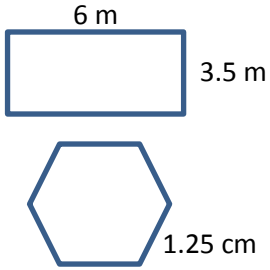
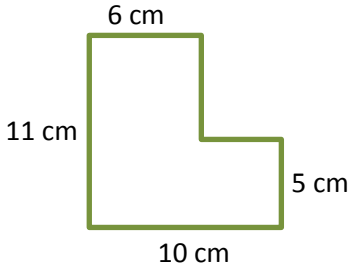
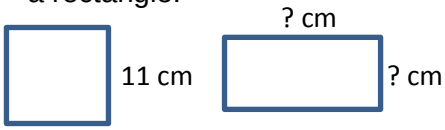
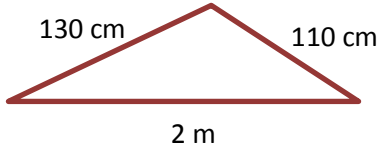
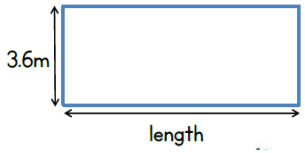
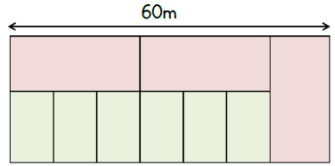
mathshub@trinityacademyhalifax.org

MathsHUBS White Rose

Term by Term Objectives

Year 7

Application of addition & subtraction

National Curriculum Statement	All students		
	Fluency	**Reasoning**	**Problem Solving**
Calculate and solve problems involving perimeter. ❖ Measure the perimeter of any 2D shape using a ruler in centimetres, millimetres and metres. ❖ Calculate the perimeter of any 2D shape. ❖ Calculate the perimeter of shapes where lengths are given in different units e.g centimetres and metres. ❖ Find missing lengths when given the perimeter.	• Measure the perimeter of the shape.  Give your answer in millimetres and centimetres. • Work out the perimeter of the shapes  • Work out the perimeter of the shape  	• How many rectangles can you draw with a perimeter of 24 cm? Can you draw any other shapes with a perimeter of 24 cm? • Sophie says “the perimeter of a regular hexagon is 32 cm. Each side is an integer” Could Sophie’s statement be correct? Explain your reasons. • A square with side length 11 cm has the same perimeter as a rectangle.  How many possible lengths and widths can you find for the rectangle? • Tom says the perimeter of this shape is 242 cm  Is he correct?	• Here is a square. Inside the square is an equilateral triangle. The perimeter of the triangle is 54 cm Find the perimeter of the square.  • The perimeter of the rectangle is 33 m Find the length of the rectangle?  • This diagram is made up of two different sized rectangles.  For each large rectangle the length is double the width. Work out the perimeter of one of the small rectangles.

mathshub@trinityacademyhalifax.org

MathsHUBS White Rose

Term by Term Objectives

Year 7

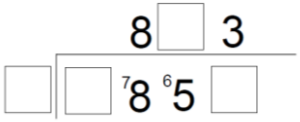
	National Curriculum Statement	All students		
		Fluency	**Reasoning**	**Problem Solving**
Multiplication & division	Multiply and divide by 10, 100 and 1000 ❖ Multiply and divide integers by 10, 100 and 1000 ❖ Multiply and divide decimals by 10, 100 and 1000	• Work out 54 x 10 703 x 100 4.7 x 1000 8009 ÷ 10 56 ÷ 100 0.4 ÷ 1000 • Fill in the missing numbers ……. x 10 = 670 100 x …… = 670 670 = ……. ÷ 1000 670 = 0.67 x ……. 6.7 = 670 ÷ …….. • Aisha is saving for a bike. The bike costs £159 She takes 10 weeks to save up for it. How much does Aisha save each week?	• Chloe says that when you multiply by 10 you just add a zero and when you multiply by 100 you add two zeros. Do you agree? Explain your answer. • 6 x 7 = 42 How can you use this fact to work out: ▪ 6 x 70 ▪ 0.6 x 0.7 ▪ 4200 ÷ 70 • Here are the answers to some questions: 6480, 0.78, 11.3, 407 Can you write three different questions that could make these answers by multiplying or dividing by 10, 100 or 1000?	• Put these calculations in order from smallest to largest. 100 × 540 | 5.4 ×1000 | 5400 ÷ 10 | 5400 ÷ 1000 | 540 ÷ 10 • Can you find a path from 6 to 0.06? You cannot make diagonal moves. 6 | x 10 | x 10 | ÷ 100 ÷ 10 | x 100 | x 100 | ÷ 10 x 10 | ÷ 10 | ÷ 1000 | ÷ 100 ÷ 1000 | x 1000 | x 100 | 0.06 • Work out the value of each symbol. 7 x 10 x 10 x ★ x 10 = 21000 ★ x 100 x ▲ = 30000 ■ x ★ ÷ ▲ = 3.6

mathshub@trinityacademyhalifax.org

MathsHUBS White Rose

Term by Term Objectives

Year 7

	National Curriculum Statement	All students		
		Fluency	**Reasoning**	**Problem Solving**
Multiplication & division	Use formal written methods for multiplication and division of integers and decimals. ❖ Multiply integers of any size. ❖ Multiply decimals with integers and decimals with decimals. ❖ The column method is recommended as the most efficient method and to follow on from Primary school. ❖ Divide integers of any size by a one digit whole number where the answer is an integer or a decimal. ❖ Divide decimals by a one digit whole number. ❖ Show that multiplication can be done in any order (commutative) and division cannot.	• Work out 56 x 28 0.24 x 1.3 675 ÷ 5 473 ÷ 8 £3.78 ÷ 4 • A school needs to buy 76 calculators. They cost £4.74 each. How much do the 76 calculators cost in total? • A wall is 19 bricks high. Each brick has a height of 10.2 cm. What is the height of the wall in centimetres? What is the height of the wall in metres? • Which calculation gives the largest answer? 266 ÷ 5 481 ÷ 9 160 ÷ 3	• Adnan thinks that the answer to 186 ÷ 4 = 46r2 Chad thinks the answer to 186 ÷ 4 = 46.2 Are they both correct? Explain your answer. • You are told that **4.7 x 9.3 = 43.71** Write down three more calculations you now know. • Write true or false next to each statement. Explain your reasons for each answer. 32 x 4 gives the same answer as 4 x 32 Lucy says that 125 ÷ 5 is the same as 5 ÷ 125 62 = 248 ÷ 4 is another way of writing 248 ÷ 4 = 62 25.9 + 25.9 + 25.9 = 3 x 25.9	• Fill in the missing numbers in this calculation  • A turtle walks 1.6 m every 15 minutes.  How far does the turtle walk in 2 hours? • Here is a rule for generating a sequence. Multiply the previous number by 1.8 then add 5 The second term of the sequence is 15 Find the difference between the third and fourth terms of the sequence. • To divide a number by 18 you can use the following rule: **Divide the number by 3 then divide that answer by 6** Use this rule to work out 387 ÷ 18 Can you find a similar rule to divide a number by 24?

mathshub@trinityacademyhalifax.org

MathsHUBS White Rose

Term by Term Objectives

Year 7

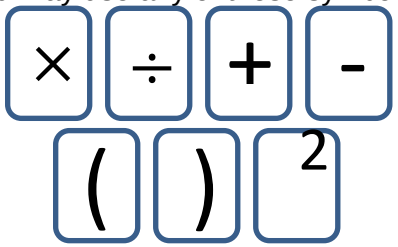
	National Curriculum Statement	All students		
		Fluency	**Reasoning**	**Problem Solving**
Multiplication & division	Use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations. ❖ Understand and know square numbers up to 12^2 and cube numbers up to 5^3 ❖ Be able to square and cube large numbers and decimals. ❖ Use square roots. ❖ Understand and work with powers up to the power of 5	• Work out 3^2 8^2 5^3 Seven squared Two cubed 4^5 Six to the power four $\sqrt{49}$ • Work out $5^2 + 2^3$ $3^4 - 9^2$ 1.6^2 $5^4 + 7^2 \times 2^3$ $\sqrt{36} - 2 \times 3$ • Work out 255^2 6.4^3 $\sqrt{81} - 8 + \sqrt{64} - 9$ • Estimate $\sqrt{50}$ $\sqrt{120}$	• Mark says that 6^3 is 18 Is Mark correct? Explain your answer. • Can you find a cube number that is greater than 100 but less than 200? • Jacob thinks that the difference between two consecutive cube numbers is always odd. Is Jacob correct? • Fill in the box with a positive integer to make the statement true. $\sqrt{3^2 + 4^2 + 12^2}$ $= \sqrt{3^2 + 4^2} + \sqrt{\square}$	• The length of the rectangle is four times the width. Work out the perimeter of the rectangle. $\sqrt{144}$  • Last year my age was a square number. Next year it will be a cube number. How old am I? How long must I wait until my age is both a square number and a cube? • $3^{\bigstar} + 7^{\blacktriangle} = 76$ $\bigstar \times \blacktriangle = \bullet$ What is the value of $\bullet$

mathshub@trinityacademyhalifax.org

MathsHUBS White Rose

Term by Term Objectives

Year 7

	National Curriculum Statement	All students		
		Fluency	**Reasoning**	**Problem Solving**
Multiplication & division	Understand the order of operations. ❖ Including addition, subtraction, multiplication, division, indices and brackets. ❖ Use this topic to consolidate work with decimals.	• Work out 3 + 4 x 7 6 + (2.5 x 9) – 1 $10 – 3^2$ 20 + 15 ÷ 5 100 – 12.7 x 4.1 • Add brackets to make this calculation correct 25 + 10 – 3 × 20 – 15 = 20 • Calculate $414 + 23 \times 74 – (2 + 4^2)$	• Joe thinks that 16 + 4 x 2 = 40 Kat thinks that 16 + 4 x 2 = 24 Who is correct? Explain your answer. • Daniel completed the following calculation and got the answer 168 2(30 ÷ 5) + 14 = 168 Can you explain what he did and where he made the mistake? • Amy says "You can do multiplication and division in any order. This is the same for addition and subtraction." Is she correct? Can you include some calculations to support your answer?	• **Countdown** Ask children to choose 1 or 2 numbers from the 'top' (25/50/75/100) and 4 or 5 numbers from the 'bottom' (1-10). Children make a target number. • What is the largest number you can make with the digits 1, 2, 3 and 4? You may use any of these symbols  What is the smallest number you can make? • Sarah has 7 bags with 5 sweets in each. She added one more sweet to each bag. Circle the calculation below that shows Sarah's sweets **7 x (5 + 1)** **7 x 5 + 1** How many sweets does Sarah have?

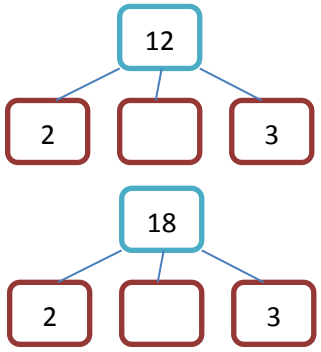
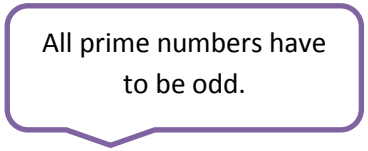
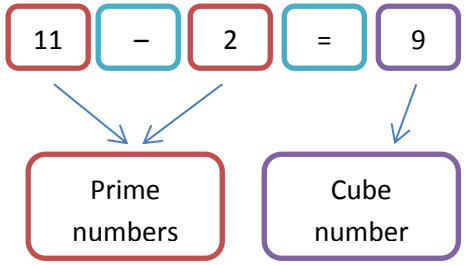
mathshub@trinityacademyhalifax.org

MathsHUBS White Rose

Term by Term Objectives

Year 7

Multiplication & division

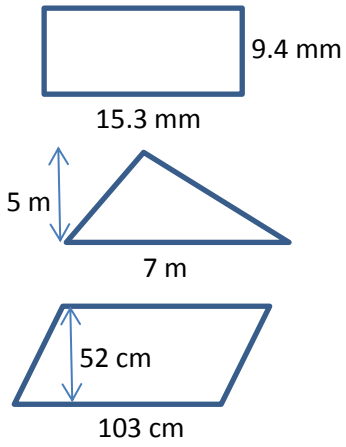
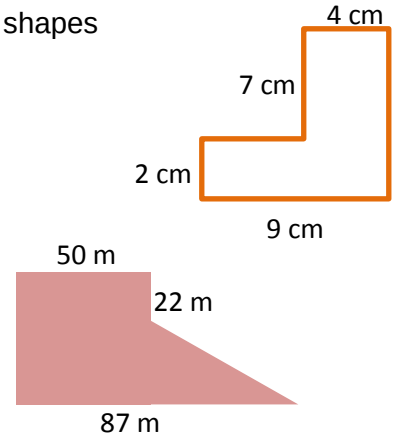
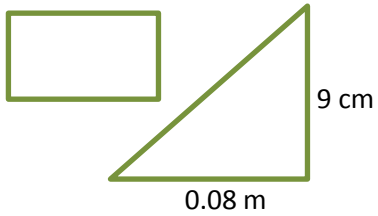
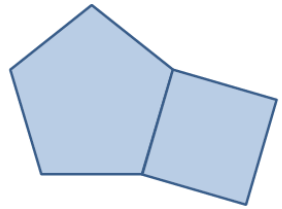
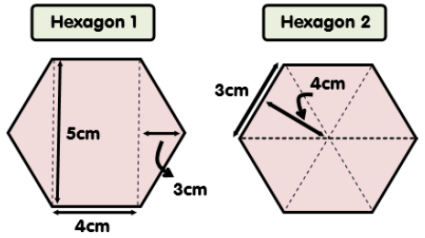
National Curriculum Statement	All students		
	Fluency	**Reasoning**	**Problem Solving**
Use the concepts and vocabulary of prime numbers, factors, and highest common factor (HCF) ❖ Establish whether a number up to 100 is prime and recall prime numbers up to 19 ❖ Find factor pairs ❖ Find the highest common factor of two numbers	• Circle all the prime numbers from the list 1, 2, 6, 7, 9, 15 • What is the 16th prime number? • Write down all the factors of 20 84 41 39 • Find the HCF of 20 and 84 • Find the missing **prime** factors. 	• Explain why 1 isn't a prime number. • Katie says,  Do you agree? Convince me. • **Always, sometimes, never** When you add 2 prime numbers together the answer will be even. • Explain why 6 is a common factor of 18 and 24 • Kam says "factors come in pairs so all numbers must have an even number of factors" Do you agree? • Can you find two 2-digit numbers that are not prime that don't have a common factor? What do you notice?	• How many cube numbers can you make by either adding two prime numbers together or by subtracting one prime number from another e.g.  • **What number am I?** I am a prime number. I am a 2 digit number. Both my digits are the same. • Tahil has £32 He shares the money evenly between his friends. He has more than 1 friend. How many friends could Tahil have?

mathshub@trinityacademyhalifax.org

MathsHUBS White Rose

Term by Term Objectives

Year 7

	National Curriculum Statement	All students		
		Fluency	**Reasoning**	**Problem Solving**
Application of multiplication & division	Calculate and solve problems involving area of rectangles, triangles and parallelograms. ❖ Calculate the area of composite shapes made up of squares, rectangles, triangles and parallelograms. ❖ Find the length of a shape given the area. ❖ Use different units of measure. ❖ Consolidate earlier learning through this topic as much as possible.	• Work out the area of each shape  • Work out the area of the shapes 	• The rectangle and the triangle have the same area.  Write down all the possible dimensions of the rectangle. • Anna is calculating the area of a triangle. She says, “I only need two of the side lengths to work out the area.” Do you agree with Anna? Explain why. • True or false? Two rectangles with the same area can have different perimeters. Explain your answer.	• The shape is made from a regular pentagon and a square.  The area of the square is 144 cm^2 What is the perimeter of the shape? • A shape is made up of a square and a rectangle.  The perimeter of the shape is 70 cm The area of the square is 121 cm^2 What is the area of the rectangle? • The perpendicular height of a parallelogram is a prime number. The area of the parallelogram is 52 cm^2 What is the length of the parallelogram? • Which hexagon has the largest area? 

mathshub@trinityacademyhalifax.org

MathsHUBS White Rose

Term by Term Objectives

Year 7

Application of multiplication & division

National Curriculum Statement

Calculate the mean from a list of data.

- Collect simple data from real life examples e.g number of pets
- Calculate the mean without a calculator consolidating prior learning.
- Solve problems involving the mean.

All students

Fluency

- Calculate the mean of these numbers:
  3, 6, 8, 2, 4, 7, 13, 16, 9, 8
  (NB consolidate dividing by 10)
- Hassan is his school's top scoring cricket batsman. Here are his results

  134, 68, 122, 113, 75, 67

  Calculate his mean number of runs.
- Four children have taken a Maths test and an English test.

Name	Maths	English
Ali	67	59
Simon	53	61
Ajay	66	57
Caitlin	72	75

  Calculate the mean:
  - Maths score
  - English score
  - score overall
  - score for each child over both

Reasoning

- Six children have taken a mental maths test. The mean score was 15 out of 20

  Can you find the missing score in the list of scores below?
  18 16 17 13 12 **?**
- Can you make up a set of five numbers which have a mean of £3.60?

  Can you find more than one combination of five numbers?
- The mean of six numbers is 5

  Five of the numbers are 6, 6, 5, 3 and 1
  Work out the sixth number.

Problem Solving

- Work out the mean of the five calculation cards

  0.034 x 100 **4.07 – 2.99**

  $\sqrt{4} + 1^3$ **4.07 – 2.99** **5.78 ÷ 4**
- Here are the heights of three horses.

  160cm $1\frac{1}{2}$ m 1.73m

  What is the mean height?
  Tino is another horse.

  The mean height of all four horses is 1.62 m
  Find the height of Tino.

mathshub@trinityacademyhalifax.org

MathsHUBS White Rose