Year 6

Mastery Overview
Summer

MathsHUBS
White Rose

Year 6

SOL Overview

As well as providing term by term overviews for the new National Curriculum, as a Maths Hub we are aiming to support primary schools by providing more detailed Schemes of Learning, which help teachers plan lessons on a day to day basis.

The following schemes provide exemplification for each of the objectives in our new term by term overviews, which are linked to the new National Curriculum. The schemes are broken down into fluency, reasoning and problem solving, which are the key aims of the curriculum. Each objective has with it examples of key questions, activities and resources that you can use in your classroom. These can be used in tandem with the mastery assessment materials that the NCETM have recently produced.

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

Thank you for your continued support with all the work we are doing.

The White Rose Maths Hub Team

mathshub@trinityacademyhalifax.org

Assessment

Alongside these curriculum overviews, our aim is also to provide an assessment for each term's plan. Each assessment will be made up of two parts:

Part 1: Fluency based arithmetic practice
Part 2: Reasoning based questions

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

The autumn and spring assessments are now available.

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Teaching for Mastery

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

The overviews:

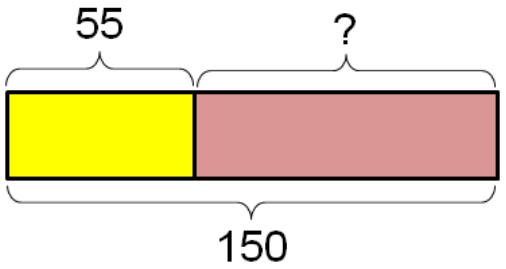
- have number at their heart. A large proportion of time is spent reinforcing number to build competency.
- ensure teachers stay in the required key stage and support the ideal of depth before breadth.
- ensure students have the opportunity to stay together as they work through the schemes as a whole 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 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.

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Frequently Asked Questions

We have bought one of the new Singapore textbooks. Can we use these curriculum plans?

Many schools are starting to make use of a mastery textbook used in Singapore and China, the schemes have been designed to work alongside these textbooks. There are some variations in sequencing, but this should not cause a large number of issues.

If we spend so much time on number work, how can we cover the rest of the curriculum?

Students who have an excellent grasp of number make better mathematicians. Spending longer on mastering key topics will build a student's confidence and help secure understanding. This should mean that less time will need to be spent on other topics.

In addition schools that have been using these schemes already have used other subjects and topic time to teach and consolidate other areas of the mathematics curriculum.

My students have completed the assessment but they have not done well.

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 do not 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.

Can we really move straight to this curriculum plan if our students already have so many gaps in knowledge?

The simple answer is yes. You might have to pick the correct starting point for your groups. This might not be in the relevant year group and you may have to do some consolidation work before.

These schemes work incredibly well if they are introduced from Year 1 and continued into Year 2, then into Year 3 and so on.

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Year 6

Mixed Year & Reception Planning

We have been working on mixed year and reception versions of our planning documentation and guidance. These have been created by teachers from across our region and wider. Working documents can be found in the Dropbox, although we hope that the final documents will be available later on in the summer term. Please contact the Hub if you would like any more information.

Problem Solving

As a Hub we have produced a series of problems for KS1 and KS2. These can be found here.
http://tinyurl.com/zfeq8gs

We are hoping to release more in September. In addition to the schemes attached the NCETM have developed a fantastic series of problems, tasks and activities that can be used to support 'Teaching for Mastery'.

It will also give you a detailed idea of what it means to take a mastery approach across your school.
https://www.ncetm.org.uk/resources/46689

Everyone Can Succeed

As a Maths Hub we believe that all students can succeed in mathematics. We do not believe that there are individuals who can do maths and those that cannot. 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
- Year group subject specialism 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 other Maths Hubs across the country.

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Term by Term Objectives

Year 6

Year 6 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, Multiplication and Division				Fractions					
Spring	Number: Decimals		Number: Percentages	Measurement			Number: Algebra		Number: Ratio		Geometry and Statistics	
Summer	Geometry: Properties of Shapes		Geometry: Position and Direction	Post SATs Project Work								

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Term by Term Objectives

Year 6

Year Group	Y6	Term	Summer

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Geometry: Properties of Shapes Draw 2D shapes using given dimensions and angles. Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals and regular polygons. Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.		Geometry: Position and Direction Describe positions on the full coordinate grid (all four quadrants). Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.	Post SATs Project Work								

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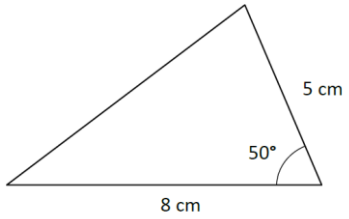
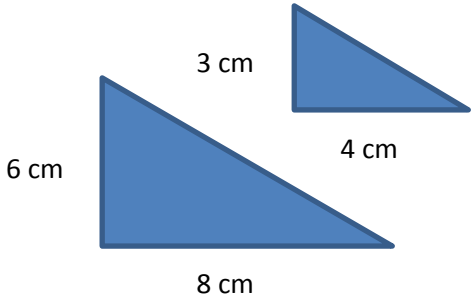
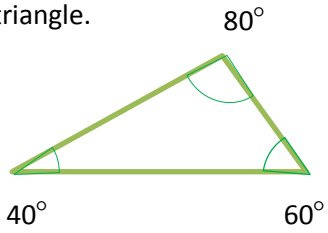
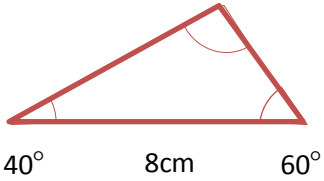
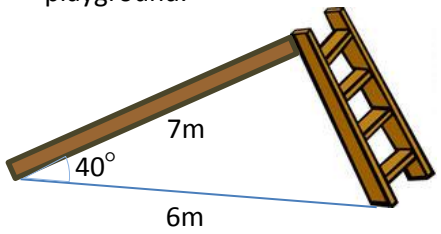
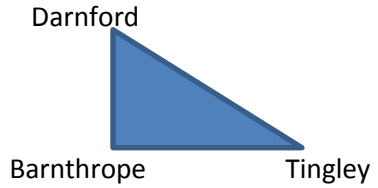
Term by Term Objectives

Year 6

	National Curriculum Statement	All Students		
		Fluency	**Reasoning**	**Problem Solving**
Geometry- Shape	Draw 2D shapes using given dimensions and angles.	• Here is a sketch of a triangle:  Draw an accurate full size diagram of the triangle. • Draw these two triangles accurately.  Measure the two other angles. What do you notice? Measure the other side. What do you notice about the sides?	• **Always, sometimes, never** A triangle has three acute angles. Draw triangles to scale to prove your answer. • Five people are told to draw this triangle.  Do they all draw it exactly the same?  Is the answer the same for this triangle?	• Mr Buckton is designing a slide for the playground.  Use a scale of 1cm to represent 1m. Make an accurate drawing of the side of the slide. How long must Mr Buckton make the ladder? • Darnford is 6km due North of Barnthrope. Tingley is 8km due East of Barnthrope.  Use a scale of 1cm to 1km to make a scale drawing. How far is it from Darnford to Tingley?

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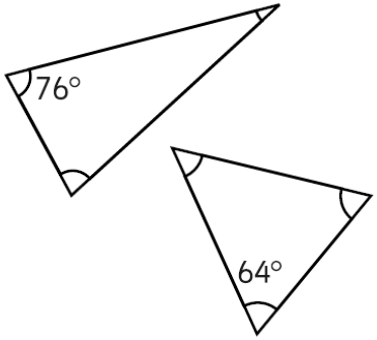
Term by Term Objectives

Year 6

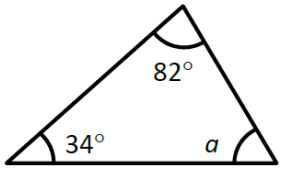
Geometry- Shape

Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals and regular polygons.

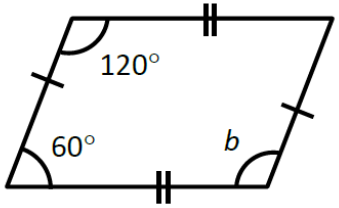
- Find the missing angles in the isosceles triangles.



- Find the missing angle.



- What is angle b?



- If one angle in an isosceles triangle is 42°, what might the triangle look like?

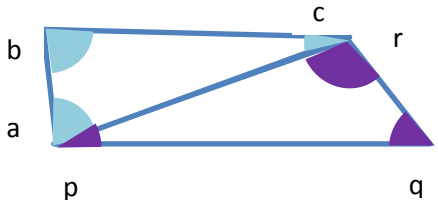
  Draw it.
  Are there any other possibilities?

- Tom says:

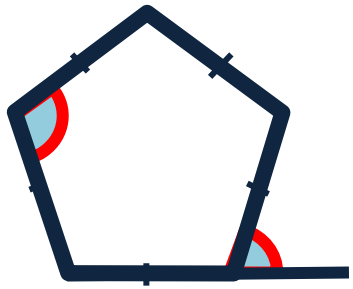
> All quadrilaterals have at least one right angle.

  Draw two different shapes to prove Tom wrong.
  Measure and mark on the angles.

- This quadrilateral is split into two triangles.
  What is a + b + c?
  What is p + q + r?
  Use this to explain why the sum of the interior angles of the quadrilateral is 360°



- The interior angles of a pentagon add up to 540°.
  Use this fact to find the missing angles in the diagram below.



- Use your knowledge of properties of shapes to say whether the following statements are true or false.

  a) A parallelogram with a right angle is a rectangle.
  b) A trapezium with a right angle is a rectangle.
  c) A rectangle with equal sides is a square.
  d) Every kite is also a rhombus.

- Sara is thinking of a quadrilateral. Think of three questions that you could ask Sara to work out what kind of quadrilateral she is thinking of.
  She can only answer yes or no.

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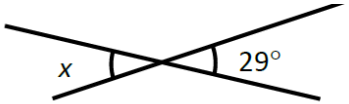
Term by Term Objectives

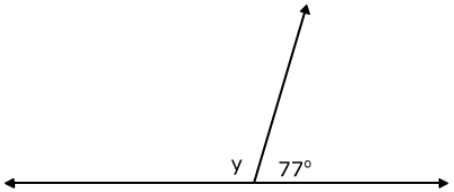
Year 6

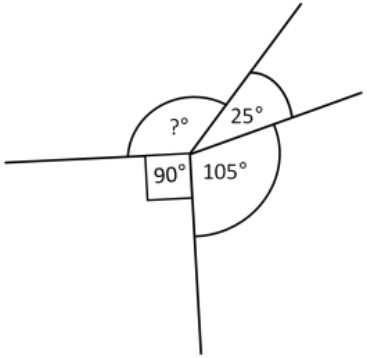
Geometry- Shape

Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

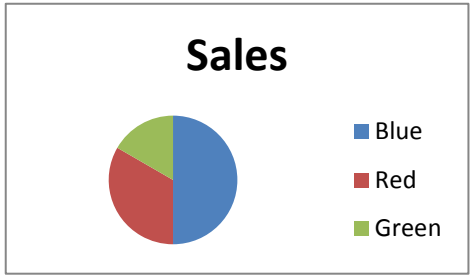
- Find the missing angles in the diagrams below.







- Here is a pie chart showing the colour of cars sold by a car dealer.



The number of red cars is twice the number of green cars.
The number of blue cars is three times the number of green cars.

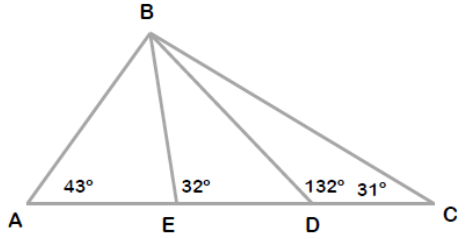
Work out the inside of angle of each section of the pie chart.

- Five equal angles all meet around a point.

What is the size of each angle?
Explain how you know.

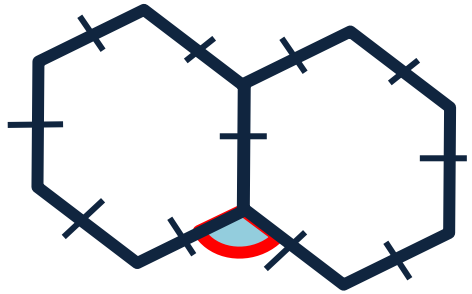
- Four angles add up to 180° on a straight line. One angle is 81°. The other three angles are equal.
What size are the other three angles?
Draw a diagram to prove your answer.

- Calculate angle B in the triangle below.



- Here are two regular hexagons.

The interior angles of a hexagon add up to 720°.
Use this fact to find the missing angles in the diagram below.



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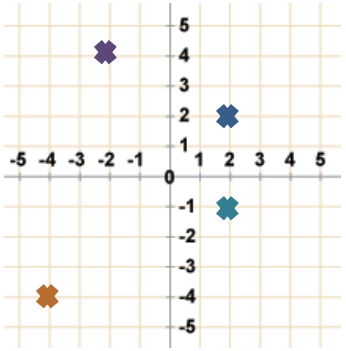
Term by Term Objectives

Year 6

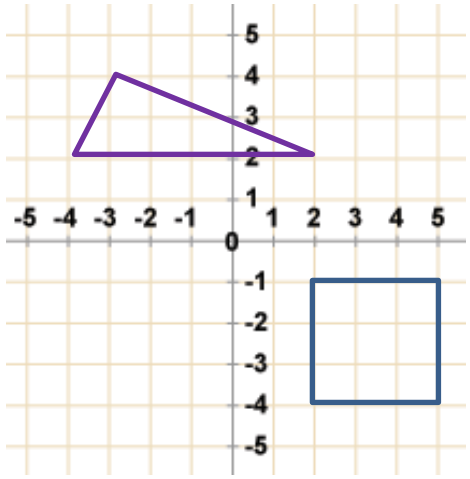
Position and Direction

Describe positions on the full coordinate grid (all four quadrants).

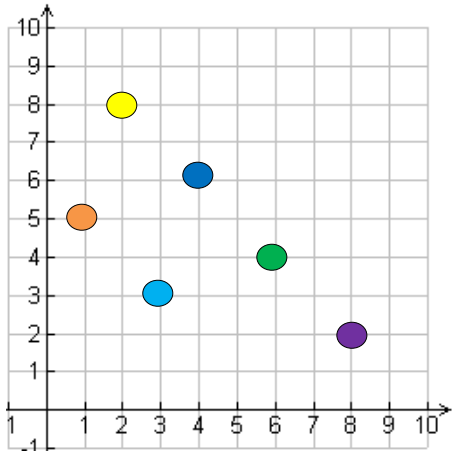
- Describe the position of the crosses marked on the grid.



- Write down the co-ordinates of the vertices of the shapes below.



- Beth draws a map of her town.



Key: My house, Shop, Park, School, Cinema, Ice rink

What is at these co-ordinates?

a) (3,3) b) (6,4)

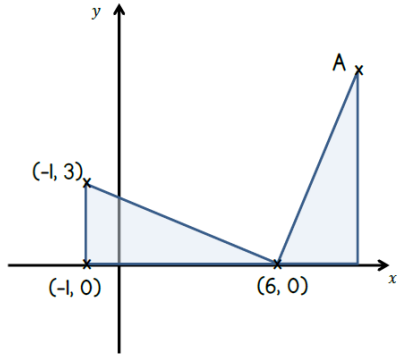
Write down the co-ordinates of these places.

a) School b) My house

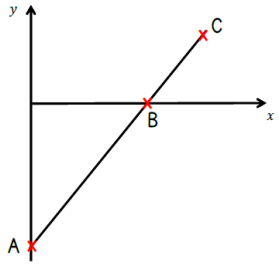
Tom and Keira look at Beth's map.
Tom says ' The cinema is at (8,2)
Keira says 'No, the park is at (8,2)

Who is wrong? Why does their mistake matter?

- The diagram shows two identical triangles. The co-ordinates of three points are shown.
  Find the co-ordinates of point A.



- A is the point (0, -10)
  B is the point (8, 0)
  The distance from A to B is two thirds of the distance from A to C.
  Find the coordinates of C.



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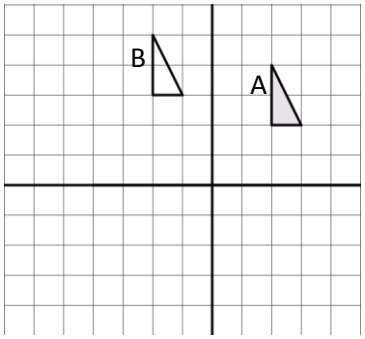
Term by Term Objectives

Year 6

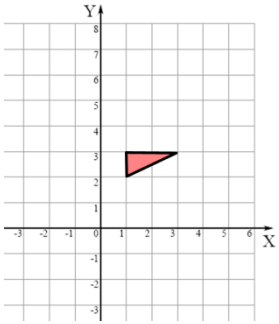
Position and Direction

Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.

- Describe the single translation that takes A to B.



- Reflect the triangle in the y axis.



Hannah translates the triangle 2 squares to the right and 5 squares down.

Find the new coordinates of the triangle.

- Two squares have the following co-ordinates:
Square A:(3, 5) (7, 5) (3, 9) (7,9)
Square B: (1, 1) (5, 1)(1, 5) (5,5)

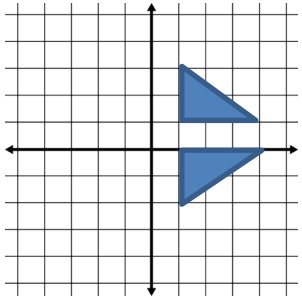
Describe the translation of square A to B and then from B to A.

- **Always, sometimes, never.**

When a shape is reflected in the y axis, the y co-ordinates never change.

When a shape is reflected in the x axis, the x co-ordinates never change.

- Phil has completed the reflection in the x axis



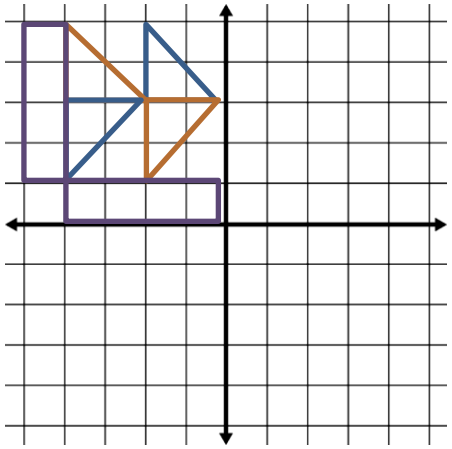
Is Phil correct?

Convince me.

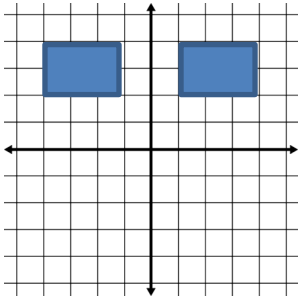
- Max is designing a pattern.

Copy the diagram and reflect the pattern in the y axis.

Now reflect the whole pattern in the x axis.



- Describe two transformations that map rectangle A onto rectangle B.



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