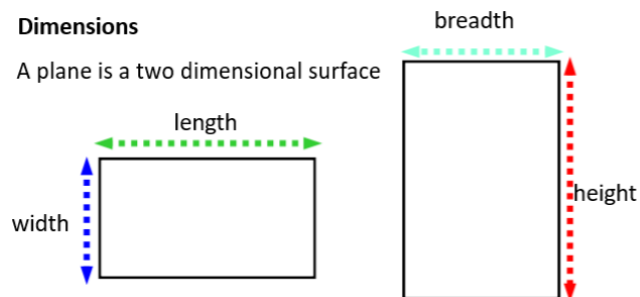


Year 5 Unit 12: 2-D and 3-D shapes (2 weeks)

Before you start...

- What shapes and their respective properties are pupils confident with?
- What do your pupils know about angles?
- How confident are your pupils at identifying types of angles in shapes?
- How confident are your pupils at reading the scales on using measuring tools?



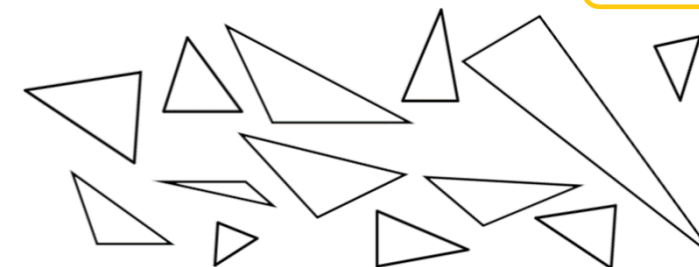
2-D or not 2-D?

It is important to use the 3-D shapes for pupils to experience and manipulate. Once an image of a 3-D shape is used, it becomes 2-D and loses the ability to interact fully with it and appreciate its properties.

Video: Using a protractor

Empty Protractor

This [article](#) from Tom Francome discusses the use of an empty protractor to support pupils in understanding how to use one to measure angles.



Video: What is a right-angle checker?

Reasoning about 2-D shapes

- L1 Identify, compare and classify 2-D shapes
- L2 Reason about regular and irregular polygons using their properties

Pupils review the names and properties, including parallel and perpendicular lines, of 2-D shapes using examples and non-examples. They then sort and classify them. By creating block letters on geoboards, pupils apply their knowledge of polygons to identify and measure the sides and angles and use this to name the shape, stating whether it is regular or irregular.

? What questions will you use to support pupils in thinking mathematically when sorting and classifying the shapes?

Exploring triangles

- L3 Compare and classify triangles based on their properties

Building on pupils' knowledge, they classify triangles according to their type based on length of sides. Pupils then move on to classify them according to the size of the internal angles. Pupils should be encouraged to draw and measure lines with a ruler and measure angles with a protractor to develop accuracy with these tools.

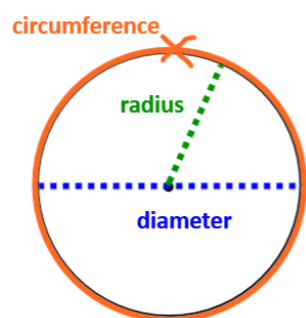
? What are typical examples of triangles that pupils will have seen? Unusual examples? Non-examples?

Mastering Geometry

This [article](#) provides guidance on mastery for all in geometry. It guides you to reflect on your pupils' current starting point.

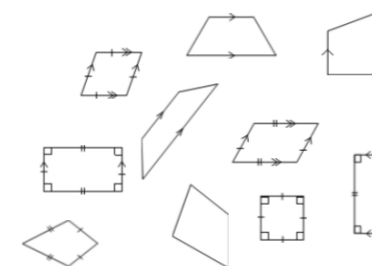
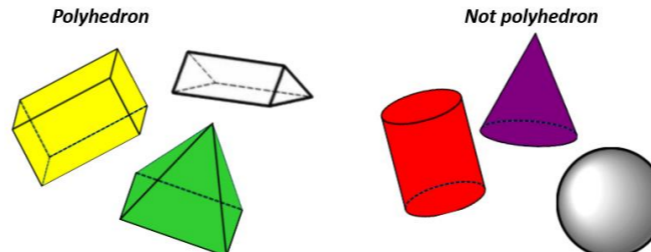
Thinking Geometry?

This [article](#) on the Toolkit will support you in considering questions stems to use to develop mathematical thinking relation to geometry.



Importance of Instruction

This NRICH [article](#) discusses the importance of spatial and geometric thinking.



Due to the content in Lessons 4 and 5, you may wish to use the Lesson 6 (a consolidation) to space out the learning over three lessons to develop pupils' understanding of quadrilaterals.

Naming parts of a circle

- L10 Illustrate and name parts of circles

Half of this lesson is planned for, while the remaining half provides an opportunity to consolidate knowledge and skills from this unit. Pupils use the vocabulary: diameter, radius and circumference to label and describe circles. Although naming the parts of a circle is a Year 6 objective, introducing this vocabulary here allows for it to be a regular part of Maths Meetings.

? What strategies will you use to bridge the gap between pupils' informal vocabulary when describing circles and the formal language?
 ? How do you plan to refine their language choices?

Reasoning about 3-D shapes

- L7 Identify, compare and classify 3-D shapes based on their properties
- L8 Recognise 2-D representations of 3-D shapes
- L9 Construct simple 3-D shapes, including making nets

During these lessons, pupils' reason about 3-D shapes including distinguishing between pyramids and prisms and sorting and comparing them using a range of properties. Using a protractor in lesson 8, pupils measure the angles on the faces of 3-D shapes and in photographs of these shapes. Pupils then sketch 3-D shapes using grid, dotted grid paper or isometric paper. In lesson 9, pupils explore packaging and boxes to see the nets of familiar 3-D shapes. They visualise the shape that will be created from a net and then construct the shapes and explore the net.

? What opportunities will you plan for all learners to visualise the 3-D shapes and packaging as a net?
 ? How will you encourage all learners to communicate their mathematical ideas about 2-D and 3-D shapes?

Exploring quadrilaterals

- L4 Identify, compare and classify quadrilaterals based on their properties
- L5 Use the term diagonal and make conjectures about angles formed

Pupils explore the names of different quadrilaterals through making them on geoboards before using rulers and protractors to denote their different properties using symbols. Lesson 5 takes the use of rulers and protractors further to measure the diagonal lines of different quadrilaterals and the angles. They then cut along the diagonals, making conjectures about the angles formed.

? What connections will you make to pupils prior learning about quadrilaterals and angles?