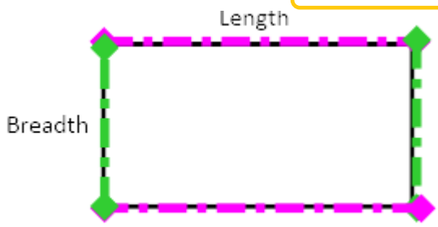
Year 4 Unit 9: Perimeter and Area (2 weeks)

The terms 'length' and 'breadth' are used throughout this unit. Breadth may be used interchangeably with width. Be flexible with these terms – using rectangles in different orientations and labelling in different ways.



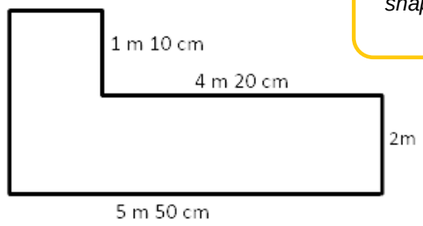
Rectilinear vs non-rectilinear

Rectilinear shapes are 2-D shapes made up of rectangles. Non rectilinear shapes are 2-D shapes that are not rectangles or made up of only rectangles. As the shapes are not made up of just rectangles, it is harder to calculate the area – shapes can cover half squares as well as whole squares.

Before you start…

- *How secure are pupils when converting between different units of measure?*
- *Do pupils have a range of addition and subtraction strategies?*
- *How familiar are pupils with the representation of arrays?*

Context: *The big picture used in this unit is the Taj Mahal and a floor plan is provided for pupils to work with. You may wish to adapt this context to a relevant topic or a building that pupils are familiar with such as the school building.*



Video: *Calculating the perimeter of composite shapes*

Exploring the perimeter of rectangles

L1 Measure and calculate the perimeter of a rectangle in cm and mm
L2 Draw 2-D shapes with differing perimeters
L3 Calculate the perimeter of rectangles in m and cm

Pupils calculate the perimeter of rectangles in mixed units, first in centimetres and millimetres, then in metres and centimetres. Use these lessons to build upon learning in Year 3, assessing pupils and identifying any gaps in learning to address before moving on to calculating the perimeter of composite shapes.

? *What assessment opportunities will you use to identify any underlying misconceptions when using mixed units and calculating perimeter?*
? *What strategies could support pupils in strengthening their understanding of the relevant sizes of mm, cm and m?*

Finding the perimeter of composite rectilinear shapes

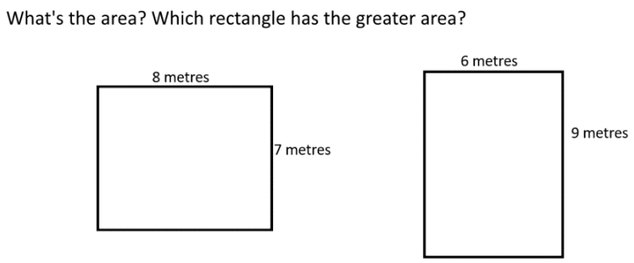
L4 Calculate the perimeter of composite shapes in cm and mm
L5 Calculate the perimeter of composite shapes in m and cm

Composite rectilinear shapes are shapes made up of only rectangles. Pupils develop approaches to calculating perimeter to ensure that all sides are included. This involves adding more than four quantities and so is an opportunity to discuss mental strategies that they may use.

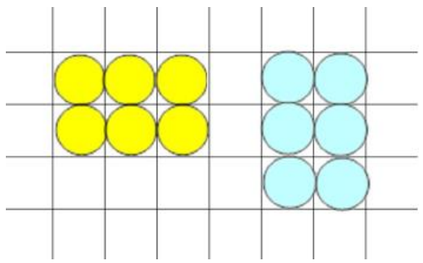
? *How will you support pupils in finding the length of missing sides of a shape?*
? *What mental strategies will you model to support pupils with adding more than four quantities?*

Converting

This unit provides opportunities to convert between units of measure. This knowledge should be regularly revisited in Maths Meetings or other curriculum areas to ensure quick recall.



The abstract notation cm^2 can be read as 'centimetres squared' and 'square centimetres' both of which are commonly used. Pupils need to know both and understand that they mean the same thing and can be used interchangeably.



Video: *Connecting area to multiplication through arrays*

Lesson 10 is used as consolidation and could be adapted based on the outcomes of previous lessons.

Calculating area

L8 Calculate and compare the area of rectangles in squared cm
L9 Calculate and compare the area of rectangles in squared m
L10 Investigate the relationship between area and perimeter

Once pupils have a deeper understanding of the concept of area, they progress to calculating area using multiplication and standard units; recording their answer in cm^2 and m^2.

? *What reasoning stems might you use to encourage pupils to justify their answer when comparing the relationship between perimeter and area?*

Understanding area

L6 Introduce area as a measure of surface using square units
L7 Find the area of a rectangle

Pupils are introduced to area as a measure of surface and begin to find area by counting squares without the use of standard measurements. Familiar representations of arrays allow for connections to be made between multiplication and the area of rectangles.

? *What examples and non-examples of area and perimeter could you provide to ensure pupils are comfortable in distinguishing between the two?*