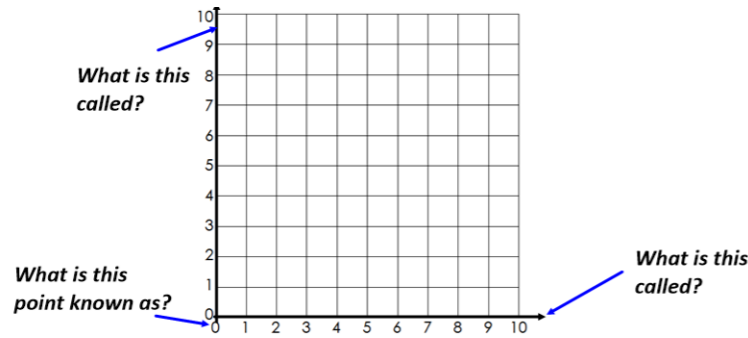# Year 5 Unit 9: Transformations (2 weeks)

Before you start…
- *What do your pupils already know about translation? Are they secure in describing using positional language?*
- *How much experience have pupils had with negative numbers? You may wish to make use of the [Positive and Negative Numbers Task Bank.](#)*

What is this called?

What is this point known as?

What is this called?

The online application [*Geogebra*](#) is a useful tool for modelling and exploring transformations with coordinates. See the Unit page for further guidance.

This unit has two consolidation lessons. You may wish to use one here to introduce negative coordinates through describing positions of points before translation of shapes.

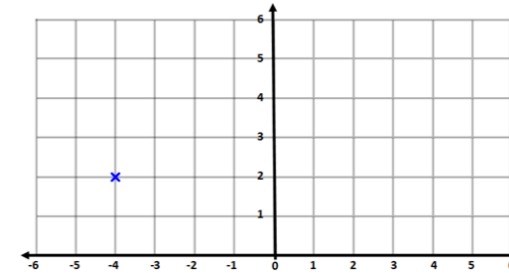**?** *What is different about this coordinate grid?*

Video: *Translating points and shapes*

Consolidating translation and coordinates

L1 Translate shapes and identify congruency
L2 Describe positions on a 2-D grid as coordinates

Pupils revisit and consolidate prior learning of translation beginning without coordinates and exploring different translations that could take place knowing the position of one vertex after translation. They deepen their understanding of congruent shapes; exposure to examples and non-examples supports conceptual understanding of this. Pupils then consolidate their understanding of coordinates in one quadrant, using standard (x,y) notation, through translation of points and line segments.
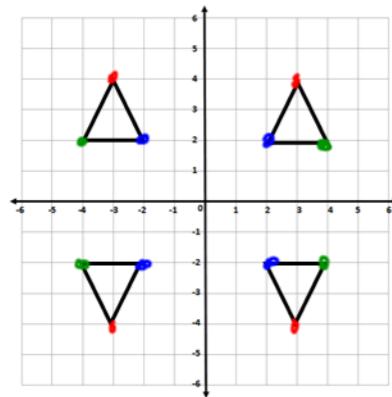
? *How will these lessons inform adaptations to the rest of the unit?*
? *What examples and non-examples will you explore to secure understanding of congruent shapes?*
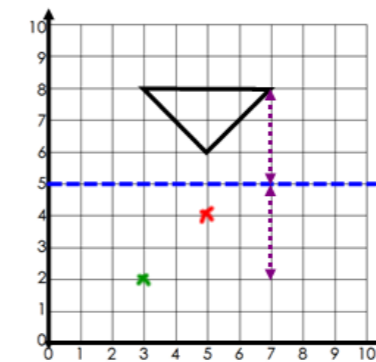
Translating polygons across zero

L3 Use coordinates in all four quadrants to describe translation
L4 Use coordinates in all four quadrants to describe translation of polygons

Through deeper exploration of translation, pupils are introduced to coordinates in four quadrants: coordinates that include negative x and y values. This provides opportunities to calculate intervals across zero. Pupils should be provided with lots of opportunities to describe coordinates using negative numbers. Take opportunities to use concrete manipulatives or online tools to physically move points and discuss the movement. Pupils should recognise that the order the translation is given in does not matter as the end result is the same. In Lesson 4, strategies for translations of polygons are explored and pupils begin to make connections with the direction of translation and the resulting change in coordinates through pattern seeking.

? *What questions and prompts will you use to promote spotting patterns and thinking what is the same and what is different with the coordinates?*

Video: *Reflection or translation?*

Reflections and translations

L9 Explore reflections and translations

The final lesson is an opportunity for pupils to combine their understanding of both reflection and translation, identifying similarities and differences in these two types of transformation. Through looking at shapes such as isosceles triangles and rectangles, pupils should be prompted to explain and show how to decide whether the shape has been translated or reflected.

? *How might you clearly explain the difference between reflection and translation? You may wish to have a go at the Independent Task to support you.*

Reflections

L6 Identify, describe and represent position on a grid following reflection
L7 Identify, describe and represent position using coordinates following reflection
L8 Reflect shapes across the x- and y-axis

Pupils consolidate their understanding of reflection and mirror lines before applying this in different ways to reflection using coordinates, applying their understanding of congruence. The learning sequence builds from exploring reflection without coordinates, to introducing coordinates and then using the x- and y-axes as mirror lines for reflection. When reflecting using coordinates, opportunities should be provided to allow pupils to make connections and spot patterns in the coordinates of the original and reflected polygons.