

Position and Direction

Maths | Year 6 | Steps to Progression Overview

The aim of this overview is to support teachers using PlanIt Maths to show the most logical sequence to teach each area of maths. We also want to fully support teachers who use the **White Rose Maths** scheme of learning to make full use of the resources available within PlanIt Maths. Whenever possible, lesson packs have been matched to each of the small steps on the **White Rose Maths** scheme of learning.

Y6 Yearly Overview

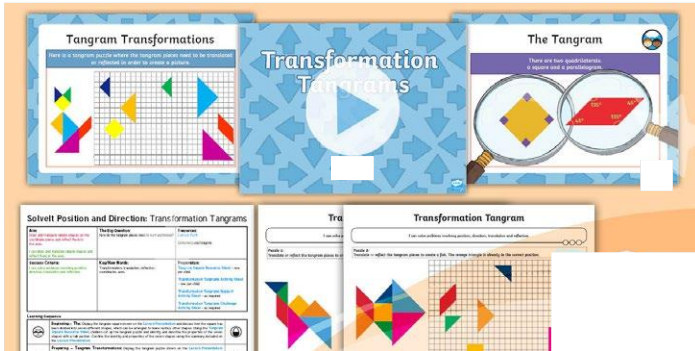
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number - Place Value		Number - Addition, Subtraction, Multiplication and Division				Fractions				Geometry - Position and Direction	Consolidation
Spring	Number - Decimals		Number - Percentages		Number - Algebra		Measurement Converting units	Measurement Perimeter, Area and Volume		Number - Ratio		Consolidation
Summer	Geometry - Properties of Shapes		Problem solving			Statistics		Investigations				Consolidation

Introduction

In this unit, the children extend their understanding of coordinates to read, write and plot positions in all four quadrants of the coordinate plane, using negative numbers. They also develop their skills of drawing 2D shapes on the full coordinate plane, identifying the coordinate positions of missing vertices and translating and reflecting the shapes.

Resources

In addition to your standard maths resources, mirrors may be helpful.

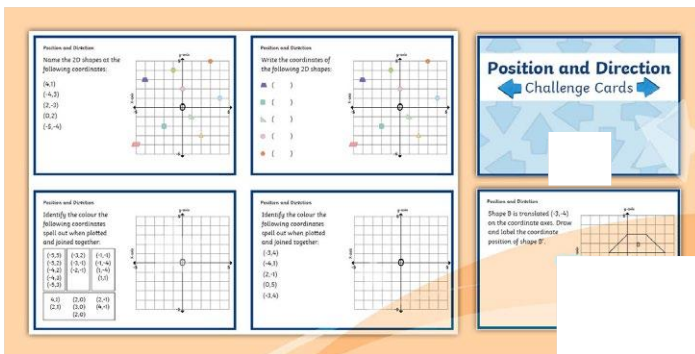


Solve! Lesson Pack: Transformation Tangrams

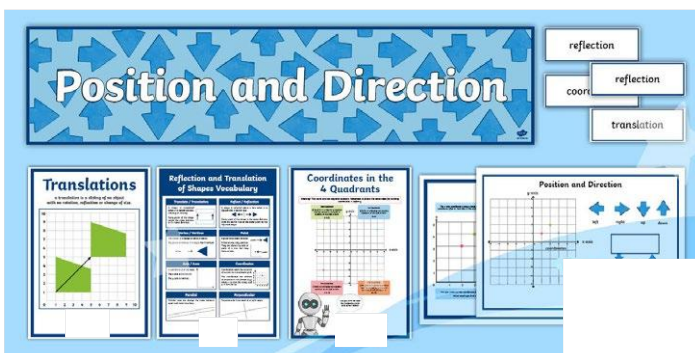
Big Question: How do the tangram pieces need to be transformed?

In this problem-solving lesson, children explore using their translation and reflection skills to position the tangram pieces to solve different puzzles.

Supporting and extending differentiated sheets are included.



Challenge Cards



Display Pack

Assessment Statements

By the end of this unit...

...all children should be able to:

- describe coordinate positions in the first quadrant;
- translate shapes on a 2D grid using the vocabulary left, right, up and down;
- reflect and draw shapes over mirror lines.

...most children will be able to:

- describe coordinate positions in all four quadrants;
- translate shapes on coordinate axes using coordinate translation;
- reflect and draw shapes on coordinate axes.

...some children will be able to:

- describe coordinate positions in all four quadrants, including using decimal half coordinates;
- translate shapes on coordinate axes using coordinate translation, and identify missing vertices;
- reflect and draw shapes on coordinate axes, and identify missing vertices.

Lesson Progression

Coordinates (1): Olympic Coordinates

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

White Rose Maths Small Step: Coordinates in the first quadrant. Coordinates in four quadrants.

Description: Children practise reading coordinates in the first quadrant in the first whole-class activity. They are introduced to reading coordinates in all four quadrants and have this modelled and led by the teacher before trying this with a partner. Individually, children find sports on a four-quadrant grid. In the plenary, they identify missing coordinates. Children recap **coordinates in the first quadrant** and learn to read **coordinates in four quadrants**.

Coordinates (2): People of the Past Coordinates

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

White Rose Maths Small Step: Coordinates in the first quadrant. Coordinates in four quadrants.

Description: Children use their knowledge to find famous historical figures behind coordinates on a grid (first quadrant) as a class. They are reminded of their work from the previous lesson on all four quadrants. They play Four Quadrant Coordinate Bingo in groups; famous figures are called out and children find them on their grid. In the plenary, children are challenged to use reasoning to identify a coordinate from the description of its position. Children recap **coordinates in the first quadrant** and learn to read **coordinates in four quadrants**.

Coordinates (3): Secret Agent Coordinates

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

White Rose Maths Small Step: Coordinates in four quadrants.

Description: In this secret agent-themed lesson, children first collect sets of fingerprints by reading them from a four-quadrant coordinate grid. The teacher recaps how to accurately read a four-quadrant grid before children crack codes in groups using their coordinates knowledge and independently decode a message. Children are challenged to write a secret message of their own using letters on a grid. Children read **coordinates in all four quadrants**.

Coordinates (4): Coordinate Reasoning

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

White Rose Maths Small Step: Coordinates in four quadrants.

Description: Children work their way through a series of coordinate-based problems, presented in different styles, shown on the Lesson Presentation and led by the teacher. They are given three differentiated problems to complete as an activity sheet. Children read, write and plot **coordinates in all four quadrants**.

Transformations (1): Drawing Coordinate Shapes

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

White Rose Maths Small Step: Coordinates in four quadrants.

Description: After reading coordinates and ensuring that they can identify and recall the names of 2D shapes, children plot coordinates and then join them to identify the shape they make. In pairs, they do this with the coordinates given on the Lesson Presentation, then complete an individual activity sheet to plot and then identify shapes. Children plot shapes using **coordinates in four quadrants**.

Transformations (2): Coordinate Shape Reasoning

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

White Rose Maths Small Step:
Coordinates in four quadrants.

Description: Children identify shapes from their coordinates on a grid. The teacher models how to identify a missing coordinate which completes a shape, where the measurements of the shape are known. In pairs, children use dominoes to match the missing coordinate point of a square to a given coordinate. Independently, they apply their knowledge of coordinates to map out shapes and find missing points. Children plot and identify missing coordinates in four quadrants.

Transformations (3): Translating Coordinate Shapes

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

White Rose Maths Small Step:
Translations.

Description: Children are shown basic translations of triangles and are asked to describe each movement. The teacher then models two-step translations and introduces the class to expressing translations as coordinates. They play bingo in small groups where translations are called out and they must match them to the translation shown as a picture on their sheet. Translations presented as algebraic formulas (e.g. $x-5$, $y-6$) are modelled to the class before they practise applying their understanding in an individual activity and the plenary. Children identify and express translations.

Transformations (4): Reflecting Coordinate Shapes

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

White Rose Maths Small Step:
Reflections.

Description: The teacher talks the class through the rules of reflecting shapes along an axis on a coordinate grid; the reflection of a shape is modelled along both axes. They are guided, in pairs, through a series of reflection questions and are then shown how to find the coordinates of reflected shapes. Children practise reflecting shapes and finding their new coordinates independently. Children draw and find the coordinates of reflections.

Transformations (5): Transformation Reasoning

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

White Rose Maths Small Step:
Translations.
Reflections.

Description: Children apply their knowledge of both translating and reflecting on a grid to complete a series of problem-solving questions presented in a variety of ways, guided by the teacher. They show their understanding in a set of three independent tasks, then self-assess. Children solve problems involving translations and reflections.