

Can I use the language perpendicular and parallel to classify, describe and draw shapes and lines?

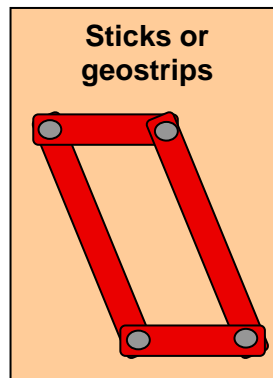
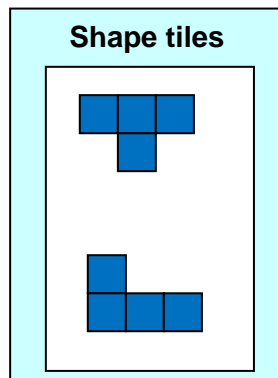
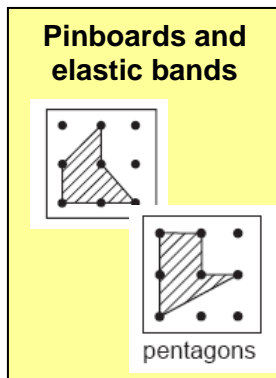
Teaching guidance

Key vocabulary

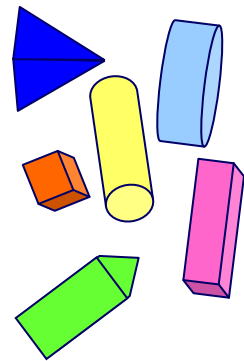
parallel, perpendicular, angle, right angle, side, face, edge, polygon, shape names

Models, images and resources

Equipment for making shapes

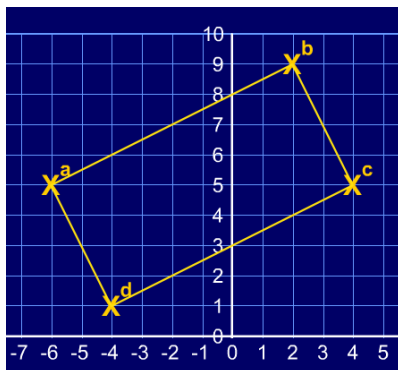


Construction kits and shape sets

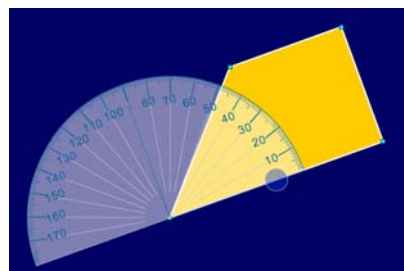


Interactive teaching programs

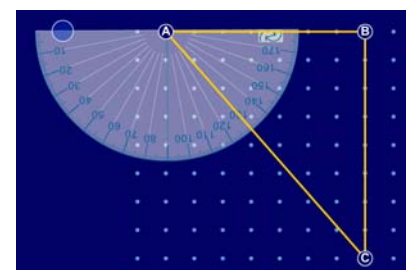
Coordinates ITP



Polygon ITP



Fixing points ITP



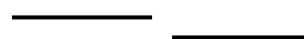
Real-life examples of parallel and perpendicular lines



Teaching tips

- Ensure that children have a secure understanding of the term 'parallel'. Ask them to describe how they recognise when two lines are parallel, for example children might say that, like train tracks, parallel lines stay the same distance apart.

- Line segments can be described as parallel if, were they to be extended, the extended lines would be parallel; so these two straight lines are parallel:



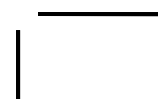
- Curved lines can also be described as parallel, for example:



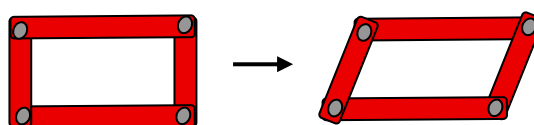
- Help children to recognise parallel faces in 3-D shapes. Ask each child to hold up two books so that their surfaces are parallel. Explain that, for faces to be parallel, every point on a face needs to be the same distance from the other face (measured by the perpendicular distance). Next ask children to tip one book and explain how they know that the two faces are no longer parallel.

- Ensure that children have a secure understanding of the term *perpendicular*. Ask them to describe how they recognise when two lines are perpendicular; for example, they might say that they would cross or meet (intersect) at right angles.

- Line segments can be described as perpendicular if, were they to be extended, the extended lines would intersect at 90° , so these two straight lines are perpendicular:



- Ask children to investigate parallel and perpendicular sides in polygons by creating shapes using geostrips (or card strips and paper fasteners) and then changing the angles between sides. In this way, they can investigate parallel and perpendicular side properties of common quadrilaterals.



3 of 3 The National Strategies | Primary
Overcoming barriers level 4–5

- Set children challenges of creating shapes with specific criteria, for example:
 - Use dotted paper to draw a polygon that has exactly three pairs of parallel sides.
 - Mark the vertices (0, 4), (1, 7) and (10, 4) onto a coordinate grid. Find a fourth vertex to form a quadrilateral with two pairs of parallel sides. Explain your method.
- Model precise use of the vocabulary *parallel* and *perpendicular* to describe and classify shapes. Provide children with opportunities to use this vocabulary in activities that involve classifying shapes using Venn, Carroll and tree diagrams.
- Provide children with shape investigations that involve reasoning, for example:
 - Which regular polygons have pairs of parallel sides? Explain the pattern.
 - Can a triangle ever have parallel sides? Explain your reasoning.
 - Pyramids cannot have any parallel faces – true or false? Explain how you know.