

Teacher's Guide: Symmetry and Reflection

Purpose

The purpose of the playlist is for pupils to learn to:

- describe shapes with line symmetry
- identify lines of symmetry
- create shapes with line symmetry.

Preparation and materials

Pupils will need:

- drawing paper
- small mirrors
- scissors
- glue
- crayons or felt-tip pens
- the centicube worksheet
- centicubes.

Process

This playlist contains seven games:

- Symmetry (Presentation)
- Memory with Symmetry (Memory)
- Catch the Lines of Symmetry (QuizNinja)
- Sort by Number of Lines of Symmetry (SuperSorter)
- Reflection Exercises (SpinIt)
- Race with Lines of Symmetry (BikeRace)

- Talk About Lines of Symmetry (SpinIt).

Start by playing the game *Symmetry*. The idea is that pupils take turns stepping on the elements, while you discuss the questions and pictures as you go. The first slide is intended as a starting point for discussion and can provide insight into pupils' preconceptions. On the following slides, pupils work together to examine shapes with one or more lines of symmetry. Be aware that some pop-ups may contain more than one element – step on the arrows to see all elements.

You may want to divide the pupils into smaller groups to work on the activities described below.

Workshop 1

Play the following games:

- Memory with Symmetry
- Catch the Lines of Symmetry
- Sort by Number of Lines of Symmetry
- Reflection Exercises
- Race with Lines of Symmetry.

Workshop 2

Draw with lines of symmetry.

Each pupil should use their own drawing sheet. Choose the level that is most appropriate for your pupils.

For some pupils, it may be helpful to have small mirrors available so that they can see what a shape or pattern looks like when reflected.

When the pupils have finished drawing and colouring, they may want to cut out the shapes and glue them onto coloured paper. Remind them to stick their shape in the middle of the paper. You could then create a class exhibition.

Level 1

Pupils can see the shape and its symmetrical patterns. They can add simple symmetrical patterns and colour the shape themselves.

Level 2

Pupils can see the outline of the shape but must complete the details themselves. It may be useful to set some minimum requirements for the drawing. For example: "The monster must have a mouth, at least one eye, hands and at least one ear" and "You must use at least two colours".

Level 3

Pupils must draw and/or cut out an imaginary animal themselves. They can choose to start by folding the paper in half and cutting out the outline of the animal, or they can draw one half and reflect it to create the other half. It may be useful to set some minimum requirements for the drawing. For example: "The animal must have a mouth, at least one eye, hands and at least one ear" and "You must use at least two colours".

Workshop 3

Symmetry Hunt

Hunt around the classroom or school for shapes, pictures or objects that have line symmetry. Ask pupils to make simple sketches or take photographs.

Afterwards, create a class display or collection of the drawings and photographs. Look at them together and discuss whether they have lines of symmetry and, if so, how many.

Workshop 4

Build symmetry with centicubes

Pupils should work together in small groups of two or three. Each group should use centicubes in different colours and the centicube sheet. If your centicubes are different colours from those shown on the worksheet, agree which colours the pupils should use instead.

Level 1

Pupils build the centicube bars shown in the picture. They then build the reflected version of the bar. Finally, they complete the pattern using the corresponding colours on the other side of the line of symmetry.

Level 2

Pupils build their own centicube bars using different colours. Each pupil builds a bar using different colours. Agree in advance how long the bars should be, for example between six

and eight centicubes. Once each pupil has built a bar, they swap with a partner. They must then build a reflected version of the bar they have received. They can draw their reflected bars.

Further work

Pupils can continue exploring symmetry using a dynamic geometry programme such as [GeoGebra](#). They can draw a line of symmetry, create a geometric shape on one side and reflect it across the line. This allows them to quickly and easily create shapes, explore reflections and investigate how changes to a shape affect its reflection.

Evaluation

Play the game *Talk About Lines of Symmetry* together as a class. Have a class discussion and review the activities the pupils have worked on. For example, discuss:

- What did you know about reflection and symmetry when we started?
- What do you know about reflection and symmetry now?
- Which activities did you like best? Why?
- Was there anything you found difficult? If so, how did you solve it?
- How did you find working together in your groups?



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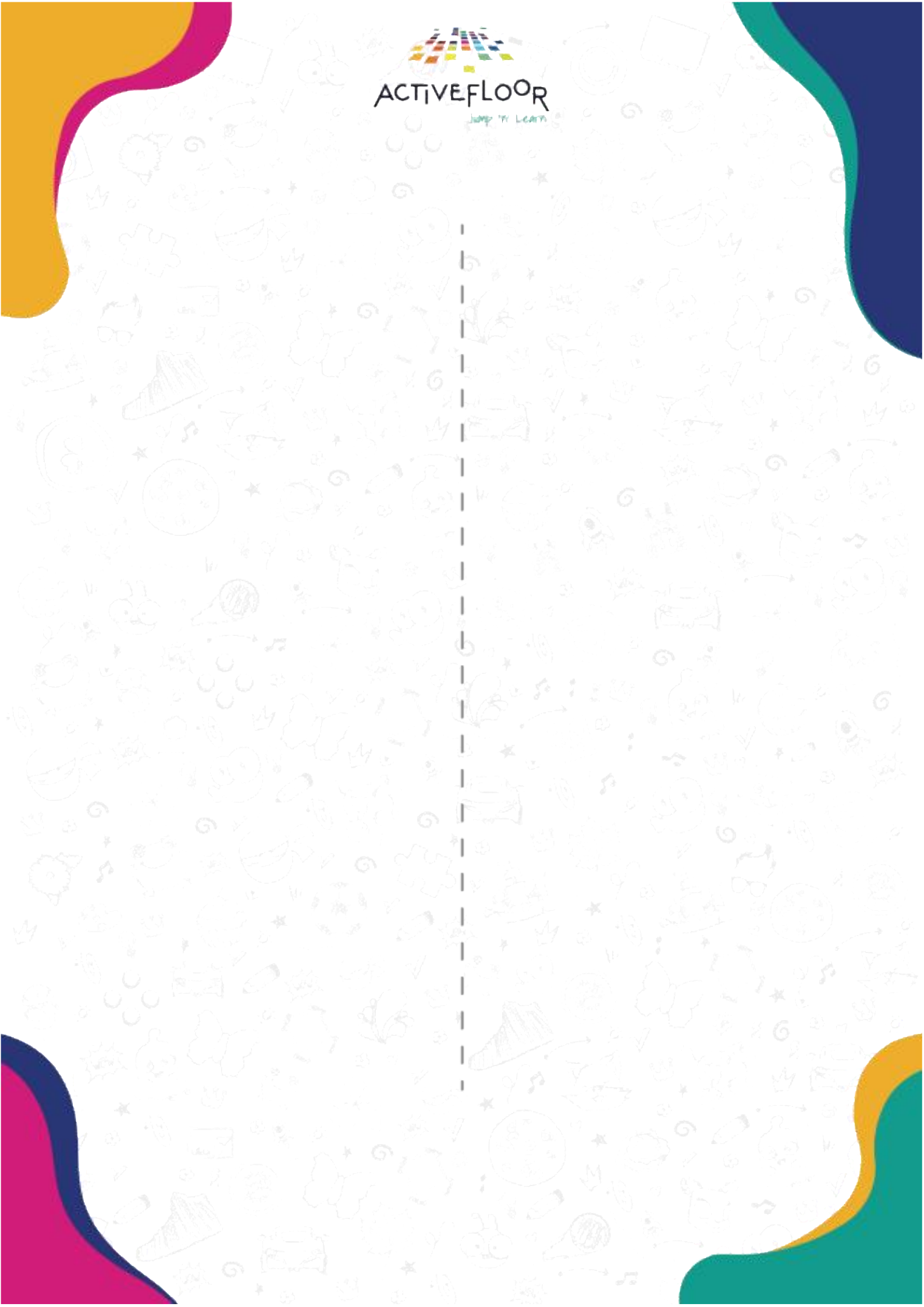
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