

Notes for parents (1).

The purpose of the activity is to help your child to:

- Create shapes with reflection symmetry
- Predict the shape that will be created by folding and cutting.

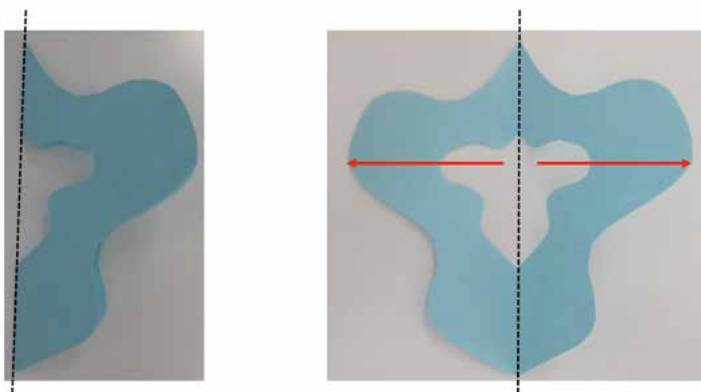
Here is what to do:

You will need squares of paper and scissors for this task. Memo pads come in squares and are ideal, but you can cut squares from newspaper.

Start with the single fold task which explores symmetry with only one mirror line. Follow the instructions. The important thing is that your child anticipates the finished shape before they unfold the paper. Ask questions like:

How can you image what the shape might look like?

It is fundamental for your child to recognise the fold line as a line of balance that will form the mirror line for the shape. For example, the fold line in this picture is on the left.



When the shape opens a matching half will form the other part of the shape. Distances from the mirror line for matching points (see red arrows), angles and areas will be the same on both halves. However, orientation (direction) will be opposite.

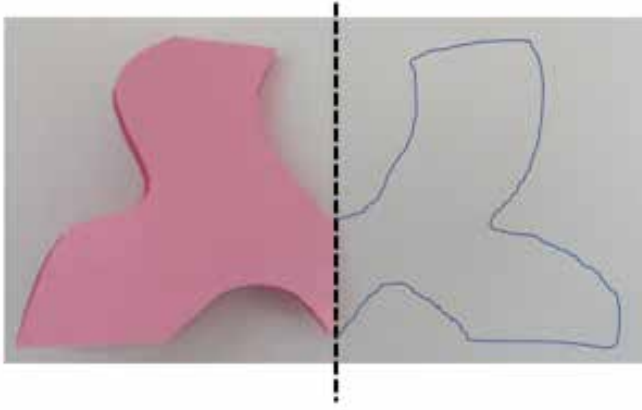
The task is more complex with a square folded in quarters. Since there are two folds there will be two mirror lines in the final shape. Again, the first step is to identify where the fold lines are and act on them in sequence to anticipate the final shape.

For example, taking the shape in the task sheet the first fold line is on the right. This means that a matching half to what can be seen will unfold to the right. Drawing the missing half (quarter actually) requires your child to attend to the properties of reflection symmetry.



Notes for parents (2).

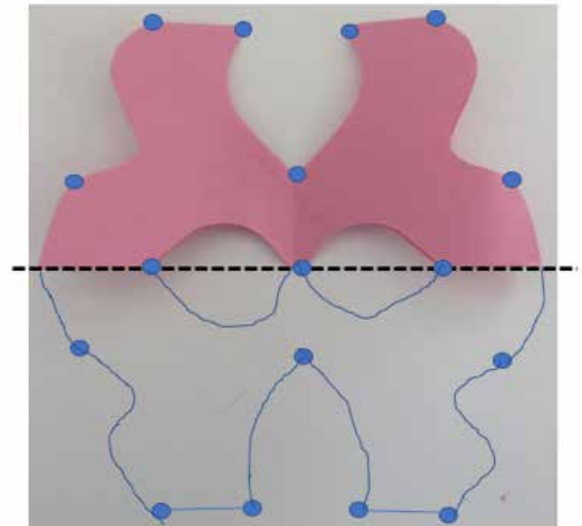
Matching points need to be the same distance at right angles to the mirror) fold) line. Angles, areas and curves should be the same facing in opposite direction.



The second fold line is at the bottom so the matching half will unfold below. Marking matching points the same distance from the mirror line is a good way to enhance drawing of the whole shape. Drawing the curves is tricky because they work in opposite orientation.

Points to note:

Fold symmetry and mirror symmetry are the same. Mirror symmetry is all around us from reflection of mountains in a clear blue lake to our faces and to the human-made designs that decorate buildings.

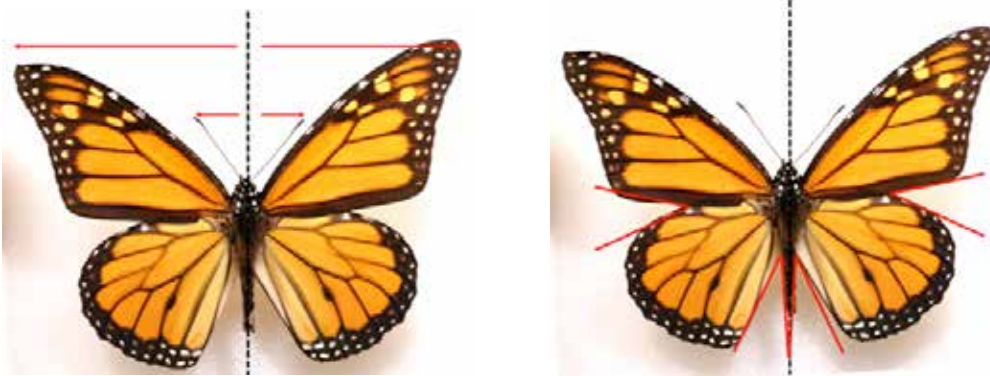


It is relatively easy and quite natural to know when a shape has mirror symmetry. Our minds even adjust small irregularities in the image, so we believe shapes are balanced. However, more complex tasks require us to use the invariant (unchanged) properties in reflection, and attend to the variant properties as well, that is features of the shape that change.

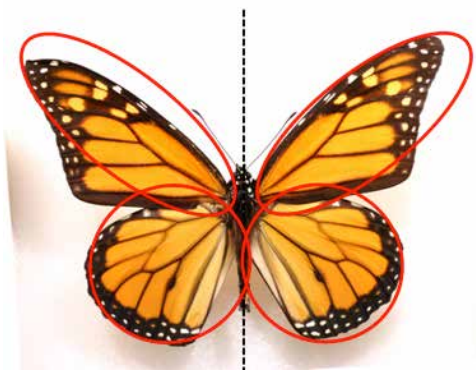


Notes for parents (3). Activity next page.

So what stays invariant as a shape is reflected?



The perpendicular (right angled) distance from the mirror line for matching points on the shape and its image are equal. Matching angles and areas are also equal. Order is preserved, that is the way the parts of the shape are connected.

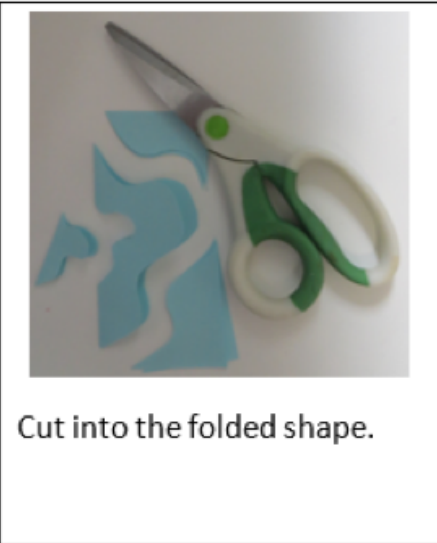


However, orientation is opposite. A feature of the shape will be facing the opposite direction in its image under reflection.

When faced with a difficult reflection task it is extremely important that children apply the invariant properties rather than just relying on their personal imagery. Attendance to properties, analytic thinking, and to image, visual thinking, are complementary. Each type of thinking supports the other.



Follow these instructions to create a symmetrical shape.



Then try this more challenging task.

