

Symmetry

Worksheet 1 Teacher's notes

1. What is symmetry? How would you define it? Can you give examples of symmetry in everyday life?

students' own answers

2. There are three types of symmetry. In three groups go online and make a short presentation to the rest of the class about each type.

Symmetry type	Characteristics	Examples
Reflection symmetry	<p>is sometimes called <i>mirror symmetry</i> or <i>line symmetry</i>. A line of symmetry divides a figure into halves that are mirror images.</p> <p>If you place a mirror on a line of symmetry, you will see half of the figure reflected in the mirror. The combination of the half-figure and its reflection will have the same size and shape as the original figure. You can use a mirror to check a design for symmetry and to locate the line of symmetry.</p>	Humans, dogs, some flowers, birds etc..
Rotation symmetry	<p>To describe the rotation symmetry in a figure, you need to specify two things:</p> <ul style="list-style-type: none"> • The <i>center of rotation</i>. This is the fixed point about which you rotate the figure. • The <i>angle of rotation</i>. This is the <i>smallest</i> angle through which you can turn the figure in a counterclockwise direction so that it looks the same as it does in its original position. 	The windmill, snowflake, and wagon wheel have rotation symmetry.
Translation symmetry	<p>You draw a basic design element. Then, you slide your pencil to a new position and repeat the element. You slide in the same way to a new position and repeat the element again, and so on. The slide movements from one position to the next are called translations.</p> <p>A design has a translation symmetry if you can slide the whole design to a position in which it looks exactly the same as it did in its original position.</p> <p>To describe translation symmetry, you need to specify the distance and direction of the translation. You can do this by drawing an arrow indicating the slide that would move the design "onto itself."</p>	Wallpaper or fabric designs

3. We all played with a kaleidoscope when a child. Do you know that kaleidoscope uses symmetry to create images? Go to

<http://www.myeducationstuff.com/Symmetry/smartboard-activity2.htm>

to have a look and play a little.

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4. Now go to <http://ed.ted.com/lessons/the-science-of-symmetry-corm-kelleher#watch> and watch an educational video about bilateral symmetry of our bodies. Answer these questions:
 - What is the definition of symmetry? *a transformation which leaves the object unchanged*
 - In biology, which organisms are examples of bilateral symmetry? *foxes, birds, humans*
 - In biology, which organisms are examples of rotational (radial) symmetry? *sea urchins, starfish, jellyfish, apples*
 - How does symmetry help to understand evolution? *which organisms are related*

5. Go online and have a look at these examples of symmetry in nature
<http://listverse.com/2013/04/21/10-beautiful-examples-of-symmetry-in-nature>

<http://ed.ted.com/lessons/the-science-of-symmetry-corm-kelleher>

<http://www.mathsisfun.com/geometry/symmetry.html>

<http://listverse.com/2013/04/21/10-beautiful-examples-of-symmetry-in-nature/>

<http://www.myeducationstuff.com/Symmetry/smartboard-activity2.htm>