

Outdoor Learning

Shaping Nature

KEEP
NORTHERN
IRELAND
BEAUTIFUL



ECO-SCHOOLS

Eco-Schools understands the value of Outdoor Learning to the development and health of pupils. We are encouraging all schools to get involved with this beneficial and fun topic. For a more in-depth look at how to get started download our Outdoor Learning resource from www.eco-schoolsni.org in the 'Resources' tab. Here is a great lesson idea to get you started:

Key Stage of Pupils involved in activity:	KS1 - KS2 - KS3 - KS4
Name of activity:	Shaping Nature
Key learning areas covered:	The World Around Us, Language and Literacy, Mathematics and Numeracy, Science (Chemistry and Biology).
Skills:	Communication, Using Mathematics, Using ITC.
Season activity occurred in:	At any time
Is this activity limited by season?	No
Preferable environment	Any. The activity is suitable for woodlands, rivers, sea shores, meadows etc.

Introduction to activity completed in class prior to going outdoors

20 mins

When you look around, you may see many shapes and designs both man-made and natural. There are geometric shapes seemingly everywhere you look! Did you know that many circles, cubes, stars, squares, and so on, occur naturally by design? Which ones can you think of?

Pupils and teachers can look up the **Woodland Trust Scotland outdoor learning pack**¹ to get inspired before starting any activity and watch the YouTube NOVA Documentary **'Shape in Nature'**² (indicated for KS4).

Pupils can begin by discussing in class shapes in nature they already know before, after or without consulting the suggested resources.



Explain the environment where you are going for your activity and how to minimise any potential risk during the activity.

Pupils will be recording what geometric shapes they find and how many shapes and categories they can identify using the table previously organised in the classroom. For a warm up you could look for shapes indoors and visible through the window.

- <https://www.woodlandtrust.org.uk/mediafile/100146207/Getting-outside-the-classroom-learning-pack.pdf>
- <https://www.youtube.com/watch?v=0YMgxlhOpg>

Pupils can also debate what they know and describe...

How does shape relate to biological functions in the natural world?

How many geometric shapes can they identify? (prepare with pupils a table with a list of shapes to be used outdoors)

How does the shape enable a leaf or a flower to perform its function?

Can you group all the identified shapes into categories?

a. Plain shapes such as squares, circles, triangles, stars, etc.

b. 3D shapes like prisms, cubes, cylinders and pyramids.



Main outdoor activity

40 mins

This activity could take place in your school grounds if you have suitable areas or in your local park.

If you have access to more than one of these environments repeat the activity as many times as you want and compare them.

Split your class into 3 groups. Split up any equipment you have (this could be done before you leave the class).

1 In the woodland: collect leaves and analyse their shape and function. Group them into same or different categories. Collect pieces of wood and proceed in the same way. For your leaf collection why not create a small book with dried and pressed samples of leaves and plants?

Group 1 Leaf group

Group 2 Wood group

2 On the beach: collect shells and analyse their shape and function. Group them into the same or different categories. Collect stones and do the same. You could keep them in shoe boxes and separate them into categories within the box using cardboard or old postcards.

Group 1 Shell group

Group 2 Stone group

3 Along the river: collect stones and once you have them grouped in categories try to identify their journey based on their shape. (Are they flat? Are they rounded? Are they sharp? Was their journey along the river long? What force has shaped them?)

Group 1 Flat stone group

Group 2 Round stone group

4 In the meadow: collect or photograph different flower heads (just a few samples, please!) Can you see any difference? Is their shape telling you something about their function? Is their shape and colour telling you something about interactions with other wildlife? Collect also leaves and see how shape and function are strictly connected. Plant stems can have several shapes too based on functionality. Can you spot any in your meadow?

Group 1 Flower group

Group 2 Leaf group

Group 3 Stem group

(Suggestions: if you have a big number of students a 3rd working group is ideal)

Plenary activity – can be partly completed outdoors and in class

20 mins

Outdoor and indoor discussion: can you see the same shapes applied in man-made features to improve efficiency? What are other interesting shapes you can find in nature? Example: the tail fins of fish – tuna fish have a lunate fin, which makes them go fast. Salmon have an emarginated fin with a big surface that gives them a lot of force to jump upstream in wild rivers...can you find more?

Discuss the results found. What are the main differences you noticed?

KS3-KS4 What is the reason you would acknowledge as the main driver of different shapes and forms in nature? They might be resource and energy related? Did the groups notice a difference in the types of objects found in each area (size, shape, colour etc.)? Discuss any observed differences.

KS4 Further discussions: Pupils can discuss if they know more about mathematics, geometry and biology in nature now than before and if their way of looking at forms in nature has changed in any way.

Follow on tasks:

Create a small display on the classroom wall of the objects collected such as a poster of the leaves by shape category.

Create graphs of each group of objects you have collected and analyse how shape and function are correlated. Display it on your classroom wall or Eco-Schools noticeboard.

This activity can be used as part of your Eco-Schools Monitoring and Evaluation – log into www.eco-schoolsni.org and record your actions in your Data Zone for the Outdoor Learning and Biodiversity topics.

TOP TIP

Can you see any difference between the shape of stones collected at the seashore and the ones along the river bank?

Pupils can take note of the basic features of the natural objects they find: colour, biological function, shape etc.

KS3

Investigate more shapes and features you can see. Find and guess the biological function related to the specific shape.

COMPETITION TIME:

find as many different shapes as possible and try to explain them!