

Blanket bog in a bottle

Learning about the importance of peat bogs

What you will learn through this activity

The type of peat bog known as blanket bog covers large areas of the uplands of Scotland.

Healthy bogs can capture and store a lot of carbon in the form of a soil called peat.

If a peat bog is not healthy it can release carbon back into the environment.

Healthy bogs help to combat the effects of climate change, so restoring this habitat is very important.

What you need:

These are suggested materials and props to use.

- Two 2-litre plastic bottles with the sides cut off.
- A small watering can, or another plastic bottle with some holes carefully cut into the lid to let the water run out.
- The bottom cut from a further two plastic bottles.
- String.
- Peat and sphagnum or grassy turf and soil.

Can't get hold of peat and sphagnum? No problem! Here are couple of easy-to-find alternatives:

1. If you have access to a garden with a lawn, dig up a bit of grassy turf and a wee bit of soil. (It will regrow if replaced, but make sure you have permission before you cut a section from your lawn!) Place the grassy turf in one bottle – this is the healthy blanket bog – and put the soil in the other bog.
2. If you have the patience to wait, then why not fill both bottles with multipurpose compost – peat free of course – and sow cress thickly over most of one bottle (your healthy bog) and patchily and thinly over the other bottle (your bog in poor condition)? After one to two weeks you will have a forest of cress; now conduct the experiment.



Photo © Richard Cooper

Part 1

What is a blanket bog?

The type of peat bog known as blanket bog covers large areas of the uplands of Scotland.

Healthy bogs can capture and store a lot of carbon in the form of a soil called peat.

Why is peat so important?

Scotland's peat bogs store ten times the carbon of all of Britain's forests combined, and the peatlands of the National Park store an estimated 20 million tonnes of carbon. Peatlands are therefore a vital tool in the fight against climate change!



If a peat bog is not healthy it not only stops absorbing (capturing) carbon, but it can release carbon back into the environment in the form of the Greenhouse Gas – **Carbon Dioxide**, contributing to climate change.



A healthy blanket bog is covered in a mop of shaggy vegetation growing out of soaking wet soil (peat). The most important plant in the 'shaggy mop' is called **Sphagnum**. This is the main peat making plant.



When the blanket bog is in poor condition there is a lot of exposed peat (called peat hags). If peat dries out in hot weather the peat dust blows away or in wet weather peat gets **washed off the bog** into the burns and rivers.

Part 2

Ready to begin? Here's how to do this activity

The experiment explained below aims to show the second of these processes, when water washes the carbon from the peat, releasing it into the environment as it flows into the burns, rivers and lochs.

For this we need:

1 Two 2-litre plastic bottles with the sides cut off - these hold two upland blanket bogs; one in good condition (with the moss - or green plant material) and one in poor condition (without this).

2 A small watering can; here a 500ml plastic bottle with a watering can rose has been used. This will be your rainfall - remember to pour equal amounts of rain on each blanket bog.



3 Finally, two wee 'buckets' to collect the water running out of the spout. In this case the bottom sections of two 2-litre bottles with holes (made using a hole punch) for string so they can be hung from the spouts (see photo above). These represent the lochs or the sea downstream of the bog where the rainwater ultimately ends up.

You don't have to use these; have a look round your house and see what you can find to construct your blanket bog ecosystems!

Part 3

Testing your bottle bogs

Now that you have built your bottle bogs, it is time to try them out.

Can you guess what is going to happen in your Bog in Bottle experiment? Have a quick discussion and see if everyone agrees with you. Can they explain their decision?

TOP TIPS

- 1 Make sure your bucket is large enough to hold the water from the watering can – especially if you are doing this experiment indoors!
- 2 Make sure the soil level in both bogs is at or just below the level of the spout.
- 3 Pour equal amounts of water, evenly over each blanket bog and see what collects in the buckets.

Hopefully the results of your experiment should be similar to the photo.



Part 4

What have results of the experiment shown us?

- 1 The bucket on the right in the image (in this case the one under the blanket bog in poor condition) has really dirty water in it. This is the peat (and therefore carbon) being washed out of the bog and released into the wider environment.
- 2 The water on the left in the image (the blanket bog in good condition) is clearer and that means the bog is not releasing as much carbon into the environment.
- 3 If you compare the two buckets there is less water in the one on the left (healthy blanket bog). This means that the bog is slowing the flow of water from the uplands to the lowlands and this helps to limit flooding downstream.

Did the results of your experiment match what you thought would happen?

Now you know how important healthy peatland is to the environment, make sure you tell all the gardeners in your family to only buy peat-free compost and help in the fight against climate change.

Part 5

Want to learn more?

Why not do a demonstration for your family, friends or teachers by filming your own experiment?

You can also learn loads more about mountain bogs in the National Park on our website at:

➤ www.lochlomond-trossachs.org/park-authority/what-we-do/conservation/mountain-bogs/

For senior phase pupils, we have a case study about mountain bogs:

➤ www.lochlomond-trossachs.org/wp-content/uploads/2018/09/Case_Study_Mountain_Bogs.pdf

Watch a short video about restoring mountain bogs in the National Park:

➤ www.lochlomond-trossachs.org/park-authority/what-we-do/national-park-partnership-plan-2018-2023/delivering-partnership-plan-year-1/key-indicator-2-peatland-restoration/

Peatland Action Project has a great resource on the importance of peat and carbon facts:

➤ www.nature.scot/sites/default/files/2019-04/Peatland%20Action%20-%20COMMS%20-%20Materials%20-%20LEAFLET%20-%20Carbon%20Facts%20and%20Figures%20leaflet%20screen%20-%20with%20full%20reference%20list%20-%202019%20UPDATE.pdf

This activity supports STEM (Science, Technology, Engineering and Maths) subjects. Examples of some Curriculum for Excellence learning outcomes are:

SCIENCE

- Having explored the substances that make up Earth's surface, I can compare some of their characteristics and uses.
- I can explain some of the processes which contribute to climate change and discuss the possible impact of atmospheric change on the survival of living things

SOCIAL SCIENCES

- I can discuss the environmental impact of human activity and suggest ways in which we can live in a more environmentally responsible way.

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