

Let's Talk bogs



Figure 1 - Common Sundew (Image from IUCN UK Peatland Programme by Norrie Russell [5]).

What is peat?

Peat is made up of partially decomposed plants, including a high percentage content of *Sphagnum* mosses.

How do peat bogs form?

Water-logged conditions lead to a reduced amount of oxygen available. This inhibits the growth of bacteria that decompose plant material, so only partial decomposition occurs. Peat bogs form very slowly when the water-logged conditions are maintained for a very long period of time, leading to the formation of a layer of peat. It can take a year for a 1 mm thick layer of peat to form. Peat depth varies from 50 cm to 3 m on average, but depths of up to 8 m are not uncommon [1].

Where can peat bogs be found?

Peat bogs occur in many places around the world. Today over 20% of Scotland's land area is covered by bogs, comprising about 15% of the global total for this habitat [2].

Why do peat bogs need to be protected?

Peat bogs are very important habitats and some plant species are only found in the particular conditions that occur in this habitat. One of the plant species that captures the imagination is the round-leaved sundew (*Drosera rotundifolia* - Figure 1), a carnivorous plant that can be commonly found in Scottish peatland habitats. For further information on this amazing

plant, check the Scottish Wildlife Trust website [3].

Peatlands are vital stores of carbon. Globally, peatlands store at least 550 thousand million tonnes of carbon - this is more than twice the carbon store in all forests [4].

Peatlands are also essential stores of water. By holding water and slowing its release into rivers, peatlands help to minimise flooding. *Sphagnum* mosses are abundant in a peatland and can hold up to 20 times their own weight in water.

How are peatlands managed?

Many peatlands have small artificial dams installed in key locations to retain water on the site, ensuring that the habitat remains water-logged so that peat can form. Naturally re-seeded trees are also removed as trees take up large volumes of water from soil and would dry out the habitat.

Let's Talk bogs discussion activity

The 'Let's Talk' series of discussion activities are resources that promote discussion skills on a wide variety of topics. Let's Talk bogs aims to provide teachers with a resource

which will help them to raise some of the environmental science issues relating to the preservation of peat bogs with their pupils. It is written for pupils at CfE second level but it could be modified to be used with younger or older pupils. This discussion activity is available to download from the SSERC website [6] and supports the following sections from Science Principles and Practice:

- making informed personal decisions and choices;
- expressing opinions and showing respect for others' views;
- developing informed social, moral and ethical views of scientific economic and environmental issues;
- discussing and debating scientific ideas and issues.

Practical activity to compare absorbency of sphagnum moss with that of other materials

The statistic that *Sphagnum* moss can hold up to 20 times its weight in water is very interesting, but how can we demonstrate what that looks like? It would be irresponsible to remove *Sphagnum* moss from a peat bog, but we can use other materials to investigate whether there are any other common materials that can match this amazing absorbency. >>

Material	Weight (g)	20x weight (g)	Water added (ml)	Water recovered (ml)	Weight of water held (g)	X weight of water	Is it as absorbent as <i>Sphagnum</i> moss?
Paper towel (example figures)	2	40	40	30	10	5	No
Towel							
Sponge							
Nappy							

Table 1 - Example recording sheet for comparing absorbency of materials to absorbency of *Sphagnum* moss [7, 8].



Figure 2 - Equipment used for practical activity.

For our investigation, we compared the absorbency of *Sphagnum* moss with that of kitchen paper, sponge, towel and disposable nappy, recording our results in the format shown in Table 1.

For this activity we used:

- A balance (or kitchen scales, accurate to 1 g) to measure the weight of the material being tested.
- A measuring jug to hold the water supply for the team.
- A 100 ml measuring cylinder to accurately measure the correct volume of water to be added to the material.
- A funnel.
- A plastic container to hold the material when the water was added to it. (Once the material had absorbed as much water as it could, the excess water was then poured back into the measuring cylinder, using the funnel to prevent spillages.)

The full set of equipment is shown in Figure 2.

This activity is a great way to apply maths in a practical science investigation. The children can discuss what everyday materials might be absorbent and decide what to investigate. It is also a good opportunity to illustrate that 1 ml of

Experiences and Outcomes

- I can use my knowledge of the interactions and energy flow between plants and animals in ecosystems, food chains and webs. I have contributed to the design or conservation of a wildlife area - *SCN 2-02a*.
- Through carrying out practical activities and investigations, I can show how plants have benefitted society - *SCN 2-02b*.
- I can report and comment on current scientific news items to develop my knowledge and understanding of topical science - *SCN 2-20b*.
- When I engage with others, I know when and how to listen, when to talk, how much to say, when to ask questions and how to respond with respect - *LIT T 1-02a*.
- When I engage with others, I can respond in ways appropriate to my role, show that I value others' contributions and use these to build on thinking - *LIT 2-02a*.
- When listening and talking with others for different purposes, I can exchange information, experiences, explanations, ideas and opinions, and clarify points by asking questions or by asking others to say more - *LIT 1-09a*.
- When listening and talking with others for different purposes, I can:
 - share information, experiences and opinions;
 - explain processes and ideas;
 - identify issues raised and summarise main points or findings;
 - clarify points by asking questions or by asking others to say more - *LIT 2-09a*.
- I can use addition, subtraction, multiplication and division when solving problems, making best use of the mental strategies and written skills I have developed - *MNU 1-03a*.
- Having determined which calculations are needed, I can solve problems involving whole numbers using a range of methods, sharing my approaches and solutions with others - *MNU 2-03a*.
- I can use the common units of measure, convert between related units of the metric system and carry out calculations when solving problems - *MNU 2-11b*.

References

- [1] <https://www.nature.scot/landscapes-and-habitats/habitat-types/mountains-heaths-and-bogs/blanket-bog> (accessed 21st May 2019).
- [2] http://www.parliament.scot/ResearchBriefingsAndFactsheets/S4/SB_12-28.pdf (accessed 22nd May 2019).
- [3] <https://scottishwildlifetrust.org.uk/species/round-leaved-sundew/> (accessed 21st May 2019).
- [4] http://www.iucn-uk-peatlandprogramme.org/sites/www.iucn-uk-peatlandprogramme.org/files/Peatland_Leaflet_ONLINE_V2.pdf (accessed 21st May 2019).
- [5] <http://www.iucn-uk-peatlandprogramme.org/uk-strategy> (accessed 21st May 2019).
- [6] <https://www.sserc.org.uk/subject-areas/interdisciplinary-learning/lets-talk/let-s-talk-bogs/> (accessed 21st May 2019).
- [7] <https://www.sserc.org.uk/wp-content/uploads/2019/06/Lets-Talk-Bogs-Practical-Recording-Sheet.pdf>.
- [8] <https://www.sserc.org.uk/wp-content/uploads/2019/06/Lets-Talk-Bogs-Practical-Recording-Sheet.docx>.

water is equivalent to 1 g and to gain practical experience using a balance and reading levels in a measuring cylinder.

Thank you to the IUCN UK Peatland Programme for giving us permission to use the Sundew image taken by Norrie Russell [5].