

TEACHER NOTES

HOW CAN WE CONSERVE BIODIVERSITY?

Learners investigate the meaning of 'biodiversity' before assessing the biodiversity of their school grounds or local area. They research to find out more about an animal that lives in the local environment and use this information to develop food chains and food webs. Learners develop ideas for conserving the local environment and implement them. They then think about how animals are adapted to suit their environment. This starts with a study of woodlice and the conditions they prefer to live in so that they can instigate a couple of simple ideas to conserve woodlice in the local environment. Then, they look at adaptations of other animals before inventing an imaginary animal that can survive in desert conditions.

CURRICULUM FOR WALES

Areas of Learning and Experience explored:

- Health and Well-being
- Humanities
- Languages, Literacy and Communication
- Mathematics and Numeracy
- Science and Technology

Activity also incorporates aspects of cross-curricular skills outlined in the LNF and DCF.

RESOURCES

Internet enabled device and internet access.

Means of recording sights and sounds, e.g. tablet, smart phone, paper and pencils, etc.

Identification keys or apps for common British plants and animals.

Hwb account (Office 365) or <https://sway.office.com/>.

Each group or pair for choice chambers - two petri dishes, cardboard, paper towels, a torch or lamp, scissors, timer, spoon (to lift the woodlice).



DOING THE ACTIVITY



- Most tasks require learners to work in pairs or groups.
- Encourage learners to share their ideas, and through open questioning, explain and justify their ideas when possible. Focus questions have been suggested to guide learners through the tasks.
- Some tasks might be more effective if pairs or groups of learners have access to an internet enabled device.
- When taking learners outdoors, it is essential that the [Countryside Code](#) is adhered to and any relevant risk assessments have been carried out with risks mitigated.

TASK 1

WHAT DO WE MEAN BY 'BIODIVERSITY'?

Explain to learners that this task should help them to understand what biodiversity is.

Screen 3

The first screen tries to activate learners' prior knowledge and understanding. Invite learners to study the image depicting biodiversity and discuss the questions posed.

Focus questions

- What can you see in the image?
- What do you think 'biodiversity' means? Why?
- Where have you heard the term 'biodiversity' before? What was it referring to?

You could ask learners to share their ideas with the class.

Screen 4

Invite learners to go think of 5 words they could use to describe biodiversity.

Then, to use some of these words to write a 'golden sentence' to explain to others what biodiversity is.

Biodiversity is....

Screen 5

Ask learners to discuss the questions posed to compare their definition with the National Geographic's definition of biodiversity:

'Biodiversity is a term used to describe the enormous variety of life on Earth.'

Focus questions

- How does the definition compare with your sentence?
- How is the definition different?
- How is the definition similar?

Screen 6

This screen explains how biodiversity is defined at higher levels. That is – biodiversity refers to all of the species in one region or ecosystem. A pop-up defining species is given. Biodiversity refers to every organism (living thing), including plants, bacteria, animals, and humans.

There are also some interesting facts in the ‘Did you know?’ section:

- Scientists estimate there are about 8.7 million species of plants and animals in existence.
- Only around 1.2 million species have been identified so far.
- Most species (more than 1 million) identified are insects.
- Millions of other organisms remain a complete mystery to us.

TASK 2**HOW CAN WE ASSESS THE BIODIVERSITY OF OUR LOCAL AREA?**

Explain to learners that they will spend some time in the locality around school to try to assess its biodiversity.

Screen 3

Before they go out, ask each pair to discuss the questions posed.

Focus questions

- What types of plants and animals do we think we will find in our school grounds/ local area? Why?
- How are we going to identify the plants and animals we find?
- How can we collect evidence of the types of plants and animals we find? Why do it like this?
- Sometimes we find signs of animals living in an environment without actually seeing them. What signs of life might we see or hear?

Screen 4

Invite learners to try the interactive activity.

Outside, you will need to:

- identify plants and animals you find.
- collect evidence of plants and animals to identify them later.
- collect evidence of signs of life when you don't see the animal.

Which five of these would be most useful to take outside...

identification app

compass

photos of birds

identification keys

photos of plants

means of recording sights

shovel

means of recording sounds

plastic bag

paper and pen

measuring tape.

Ask learners to give their reasoning as to why they will need each item selected and why they wouldn't need others.

Screen 5

This screen gives the instruction - Go outside and try to find evidence of as many types of plants and animals as you can.

Screen 6

Back in school, ask learners to join up with another pair and discuss the questions posed.

Focus questions

- What animals and plants did you find evidence of in the outdoor space?
- How did you know that each organism was living there?
- How confident are you of your findings? Why?
- What else could you do to discover other animals and plants that live in the outdoor space? How might this help?

Screen 7

Invite learners to complete the table to show what they found. You could do this as a collated list on the whiteboard to save time.

Screen 8

Randomly allocate one type of animal to each pair. Invite learners to find out more about this animal by doing internet research. Ideas as to the types of information that might be useful are given as:

- What does it eat?
- How does it get its food?
- Where does it live in the environment? (its habitat)
- What are the conditions of its habitat?
- How is it suited to living in its habitat?

Tell learners that they will use this information to make a Sway about the animal to share with others.

Screen 9

This screen gives detail on how to make a Sway.

- Login to your Hwb account, access Office 365 and find and open Sway. Or click here to access Sway: [Sway](#).
- Click Create new.
- A Sway card will appear, now add a title to your Sway. Try the name of the animal you have researched.
- Click Background image. Sway will begin to search for images relating to your title. These will be displayed on the right-hand side. Click the category that suits your title. Choose an image and drag and drop on to your title card. You can search for videos in the same way.
- Now click Play... Sway will use algorithms based in graphic design to suggest the appearance.
- Practise changing the graphic design.
- Click on + to add other images with text to include what you have found out about your animal.
- Share your Sway with the class.



TASK 3

HOW ARE THE ORGANISMS WE FOUND INTERDEPENDENT?

Explain to learners that all organisms on Earth depend on other organisms for food, shelter, habitat, etc. In this task, they are going to think about how organisms are interdependent and apply this to help them to conserve the local environment.

Screen 3

Invite learners to complete the diagram of a food chain to show how the animal they studied feeds. The screen shows how a food chain can be extended by adding organisms before and after.

Screen 4

Ask pairs of learners to draw three food chains for their animal. Tell them that each food chain needs to start with a different plant or finish with a different animal.

Screen 5

Invite learners to use their food chains from the previous screen to form a food web.

Screen 6

This screen tells learners that food chains and food webs show how energy and matter is passed from one organism to another as they feed. Ask learners to discuss the questions posed.

Focus questions

- Where does the energy come from at the start of a food chain or web? Why do you think this?
- What types of matter pass from one organism to another when it feeds? What does the organism do with this matter?
- Why do you think animals in a food chain or web are called consumers?

Screen 7

Ask learners to try the question to gauge their thoughts about why plants in food chains and webs are called producers.

Plants are called producers because they...

- produce energy
- absorb energy from the Sun
- make food for animals
- make sugars and proteins
- can reproduce.



As they first select their ideas, ask them for their reasoning. Try to quash the idea that anything can 'produce' energy – energy cannot be made or destroyed it can only be conserved.

Screens 8-9

Invite learners to try and complete the food web with arrows that show how energy passes through a food web.

Again, as they work on the interactive, ask them for their reasoning. Then, show them the completed food web.

Screen 10

Ask learners to think about their local environment and the wide variety of plants and animals they found and to discuss the questions posed.

Focus questions

- How should we conserve the local environment?
- What can we do to make sure that conditions don't change over time?
- How can we help the plants and animals that live there to stay there?

Invite them to make a list of 5 things they could do to conserve the local environment. You could share these ideas with other schools in Wales.

Screen 11

To take their ideas further, ask learners to discuss the questions posed.

Focus questions

- Which of our ideas should we do to conserve the local environment?
- How are we going to do this?
- Do we need to make something? If so, what and how?
- Do we need to talk to anyone? If so, who and what do we need to talk about?
- Do we need to email anyone? If so, who and what do we need to write about?
- How are we going to know if our idea works?

Screen 12

This screen gives the instruction - Carry out your idea to conserve the local environment.

Screen 13

Invite learners to reflect on the whole task by completing at least one of the sentence starters and share these in class. The sentence starters are:

I understood better when...; The thing that really helped me today was...; One thing we did today that made me realise...; To improve I could...; After reading, I...; I could use this strategy when...; After talking to...; The next time I could...; The thing I found most difficult was...; One idea/thing I still don't understand is....

TASK 4

HOW ARE ORGANISMS ADAPTED FOR SURVIVAL?

Explain to learners that they are going to study woodlice to find out more about the conditions they prefer to live in (their habitat) and how they are adapted to live there. Then, they are going to look at other adaptations that help animals survive in their habitat.

Screen 3

Tell learners that they are going to go outside and try to find some woodlice.

Ask them to think about:

- Where will you look for woodlice? Why?
- What will you put the woodlice in to bring them inside? Why?

You could ask learners to share their ideas with the class.

Ensure that woodlice are brought into school in moist leaf litter – at least 5cm deep.

Screen 4

This screen gives the instruction - Go outside and collect 5 to 10 woodlice with your partner. Make a mental note as to where you found them so you can put them back in the correct places.

Screen 5

Invite learners to design choice chambers using the following for each pair or group: two Petri dishes, cardboard, paper towels, a torch or lamp, scissors, timer, spoon (to lift the woodlice).

They will need choice chambers to find out if woodlice prefer:
light or dark conditions
moist or dry conditions.

Ask learners to try out their choice chambers to see if they work and if not, to redesign them so they do.

Ideas for choice chambers can be seen here: <https://www.science-sparks.com/choice-chambers-animal-behaviour-investigation/>

Screen 6

As part of their experiments, ask learners to think about:

- How long will the woodlice have to make their choices? Why?
- How will you record your results?
- How many times will you repeat your experiment? Why?

Then, to use their choice chambers to find out which conditions woodlice prefer to live in.

Screen 7

Explain to learners that now they have found out about the conditions woodlice prefer, they are going to observe a woodlouse with a magnifying glass and discuss the questions posed.

Focus questions

- How could we describe what a woodlouse looks like? Which words should we use?
- Woodlice are adapted to live in their habitat. What features does the woodlouse have that help it to live well in its habitat?

Ask learners to return the woodlice to their outdoors environment.

Screen 8

Invite learners to watch the [video](#) (just over a minute long). Then, to discuss the questions posed.

Focus questions

- What surprised you in the video? Why?
- How did the video support what you found out about woodlice?
- How are woodlice adapted to live in their habitat?
- Where else would you expect to find similar animals (crustaceans) to woodlice? Why?

Screen 9

Ask learners to think about how they could conserve woodlice in the school grounds and discuss the questions posed.

Focus questions

- What can we do to help woodlice survive in our school grounds?
- How will our ideas help woodlice survive? How do we know that?

Then, to choose two things they can do quickly and easily to help woodlice survive and to implement their ideas.

Screen 10

This screen gives a reflection triangle for learners to consider the strategies they used to study woodlice. Invite learners to start at the base of the triangle and think about the ways they worked: individually, groups, online, paired work. Then, to consider the strategies they used from: reading, researching, drawing, reviewing prior work, classifying, discussing, making prototypes, using models, using examples, making lists. They can also suggest other strategies used. Finally, ask learners to consider which strategies worked the best. This latter information will be useful for similar future activities.

Screens 11-14

The next four screens give images of animals in Wales. Ask learners to think about how each one is adapted to its habitat.

Screen 15

Invite learners to design an imaginary animal that lives in these conditions...

It lives in a sandy desert. The desert is 30°C in the day and 0°C at night. It eats cacti to get food and water. It is the food of desert rats that are most active in the evening.

Ask learners to draw their imaginary animal and think about...

What adaptations does it need to have to:

- move on sand
- survive in these temperatures
- eat cacti
- avoid being eaten?

Screen 16

Ask learners to make notes on their drawing to explain how its features help it to survive. Then, to think about its behaviour and make further notes on the diagram about when it is the most active and why.

Learners could share their imaginary animal with the class.