

Learning Resource

PROSIECT AFANCOD CYMRU



WELSH BEAVER PROJECT



Wildlife Trusts Wales Ymddiriedolaethau Natur Cymru



The Beavers in Wales learning resource has been produced by the North Wales Wildlife Trust on behalf of the Wildlife Trusts in Wales.



Ymddiriedolaeth Natur **De a Gorllewin Cymru** Wildlife Trust of **South & West Wales**





Ymddiriedolaeth Natur Maldwyn Montgomeryshire Wildlife Trust



Ymddiriedolaeth Natur Sir Faesyfed Radnorshire Wildlife Trust



Wildlife Trusts **Wales** Ymddiriedolaethau Natur **Cymru**





Amaetinyddol Ewedig Isdoddi Inewn Ardsloedd Gwledig an Agricultural Fund for ural Development: Welsh Government

The project has received funding through the Welsh Government Rural Communities - Rural Development Programme 2014-2020 – Enabling Natural Resources and Well-being Scheme, which is funded by the European Agricultural Fund for Rural Development and the Welsh Government.

Foreword by lolo Williams

Beavers are truly incredible animals. They can help restore and manage river and wetland habitats for a huge variety of wildlife, and because they can help tackle important issues like downstream flooding, they're great for people too. The wildlife of Wales is under severe threat, and we are in danger of losing some species altogether, so beavers are a vital element that can help reverse the decline of biodiversity in our countryside.

Beavers provide an excellent example of how everything in nature is linked and their study can be incorporated into many subjects in the curriculum. I have no doubt that all children will enjoy learning about beavers and the fantastic work they do from this Beavers In Wales education pack.



Introduction

The Eurasian beaver (*Castor fiber*) is native to Wales with a distribution that extends across Britain to Europe and into Asia. Beavers became extinct in Wales around the Middle Ages due to over-hunting by humans, mainly for their meat, fur and scent glands. This was echoed across Britain and Europe so that by 1900 only a relative handful of beavers remained in six small relict populations on the continent. However, since the 1920s beavers have been reintroduced to over 25 European countries, with the latest reintroductions taking place in Scotland and England.

Beavers play a vital role in enriching biodiversity because their activities restore and manage river and wetland habitats. They are often termed a 'keystone species' because they benefit a wide range of plants and animals. They can also benefit humans because their activities improve water quality, regulate flow, alleviate downstream flooding, stabilise water tables and reduce erosion in rivers.

These are some of the the reasons why having beavers back in the wild in Wales is so important.

The Welsh Beaver Project led by North Wales Wildlife Trust on behalf of the Wildlife Trusts in Wales is leading the work to re-establish beavers back into the wild in Wales.

The Welsh Beaver Project *Beavers In Wales* learning resource has been designed so that the subject of Eurasian beavers can be used to teach across all six areas of learning and experience within the curriculum. It is very much hoped that teachers across Wales and beyond will find this teaching resource interesting, useful and engaging for learners.

Further information about beavers can be found on the Welsh Beaver Project web page:

Links to Curriculum for Wales

The activities in this learning pack support the four purposes of the curriculum:

- Ambitious, capable learners, ready to learn throughout their lives
- Enterprising, creative contributors, ready to play a full part in life and work
- Ethical, informed citizens of Wales and the world
- Healthy, confident individuals, ready to lead fulfilling lives as valued members of society.

Activities include descriptions of learning, highlighting the areas of learning within Curriculum for Wales and covering progression steps 2-3.

The activities focus on developing learners' skills to take responsibility for their own learning and provide opportunity for problem solving, collaboration, communication, creative thinking, critical thinking and independent research. They include high-quality questions to improve learners' higher-order thinking skills and lead to discussion.

The pack incorporates the cross-curricular skills of the Literacy and Numeracy and Digital Competence frameworks and the activities fulfil the requirements of good learning and teaching, in accordance with the 12 pedagogical principles.

The pack links to the goals of the Well-being of Future Generation (Wales) Act. Respecting and protecting our landscapes and wildlife is an integral part of achieving a more sustainable, equitable and prosperous Wales.

Nature plays an essential role in combatting climate change, and beavers can contribute to restoring diversity of habitat in riparian woodlands. As well as bringing ecosystems to life by creating and managing wetlands, beavers can also help reduce flooding and clean river water.

There is an emphasis on outdoor learning in several activities, focusing on improving well-being, physical activity and develop an appreciation of the wealth of nature in Wales.

It is possible to adapt or expand on the activities to answer individual learner or class needs.

Activity 1 What can you tell me about beavers?

In this activity, learners will share their current knowledge about beavers and consider areas for further learning and exploration.

Opportunities for learners to:

- Activate prior knowledge about beavers
- Consider what they would like to learn about beavers
- Reflect on what they learn about beavers over time

Links to the Curriculum for Wales

Areas of Learning and Experience	Statements of what matters Enquiry, exploration and investigation inspire curiosity about the world, its past, present and future.		
Humanities			
Science and Technology	Being curious and searching for answers is essential to understanding and predicting phenomena.		

Resources

- Internet access
- Reference books
- Beaver soft toy/photo
- Box/bag
- Resource 1 KWL Grid
- Resource 2 -
- Connections



Vocabulary

Beaver Lodge Dam Crepuscular Rodent Coppice

Questions/discussion points

What do you know about beavers? How do you know this? What questions would you like to ask? What would you like to find out? How is a beaver different to other animals? Why do you think that?

Activity

Explain to learners that they will be studying a very important and interesting animal. Hide a photo/soft toy of a beaver in a box/bag. Challenge learners to ask questions to guess which animal it may be.

When learners have guessed correctly, share a copy of **Resource 1** or ask learners to create their own grid in their books. Ask the learners to write what they know about Beavers in the **K** column.

In pairs, ask learners to discuss what they would like to learn about beavers. Encourage learners to write down any specific questions they have about beavers in the **W** column.

Ask the class to consider where or how they could find more information about beavers.

Challenge the class to use their independent research skills to find out an interesting fact about beavers to share. To ensure learners search the internet effectively, you may wish to remind them how to use key words, the minus operator and quotation marks as effective search strategies. You may also wish to encourage learners to use a specific search engine.

Ask learners if they have already found out the answer to any of their questions in the W column. Remind learners to revisit their grid to write a summary of what they have learnt in the **L** column during any further activities.

Additional Activity

In pairs, ask learners to share what a beaver may have in common with the animals/items on **Resource 2**. Why do the learners think this? You may wish to question any misconceptions or provide an opportunity for learners to discuss their thoughts.

Activity 2 Be a Beaver!

In this activity, learners will create beaver masks/crowns, get involved in role play and learn about the impressive physical and behavioural adaptations that help beavers to survive in their environment.

Opportunities for learners to:

- Identify physical features, behaviours and habitat of a beaver
- Consider how a beaver has adapted to its environment
- Use a range of materials creatively to design and create their own mask/crown

Links to the Curriculum for Wales

Areas of Learning and Experience	Statements of what matters		
Expressive Arts	Exploring the expressive arts is essential to developing artistic skills and knowledge and it enables learners to become curious and creative individuals.		
Science and Technology	The world around us is full of living things which depend on each other for survival.		

Resources

- Internet access
- Reference books
- Resource 3, 4 and 5
- Aprons
- Cardboard
- Non-toxic glue
- Stapler
- Paints and brushes
- String or wool
- Scraps of fabric
- ... any other recycled
- materials

Vocabulary

Adaptation Habitat Teeth Aquatic Environment Features

Questions/discussion points

What adaptations do beavers have that help them survive in their environment? What do beavers eat? Why do you think this? What do you think could be improved? What could be changed?

Activity

Ask learners to research different types of masks. What do they like or dislike about the masks? Explain that they are going to make their own beaver masks and discuss their ideas.

Before they start to design their masks, provide an opportunity for learners to investigate and identify different beaver body parts.

Learners may decide to create a mask that features the head of a beaver (see **Resource 3**) or they may wish to create a crown or hat (see **Resource 4** and **5**). Some learners may choose to use provided resources, however, learners should be encouraged to design and make their own mask, using a range of available materials. Encourage learners to use recycled materials such as cardboard or reclaimed textiles.

Once learners have completed their masks, select learners to come to the front of the class and take the "hot seat." Encourage the class to ask the questions, and to listen to the responses. Discuss the adaptations beavers have for living on land and in water, e.g. webbed hind feet and a large flat scaly tail that helps them swim.

Provide opportunity for learners to go outside with their masks. Challenge learners to find the most suitable habitat for beavers within the school ground location, explaining why.

Allow time for learners to reflect on their own and others' work. What did they like about their mask? How could it be improved?

Additional Activity

Support learners to put double-sided tape along the sides of their crown or mask, before heading outside to enjoy a walk on school ground or to a nearby park or woodland. Encourage learners to decorate their masks by adding leaves, herbs, twigs or bark that could form a part of a beaver's diet to the sticky tape as they go.

Activity 3 Beavers in Wales

In this task based learning activity, learners will gather information and create a presentation about beavers to share with another group, class or in a school assembly.

Opportunities for learners to:

- Develop, organise and present information and ideas
- · Locate, select and use information, responding to what has been read
- Express themselves for different purposes and audiences

Links to the Curriculum for Wales

Areas of Learning and Experience	Statements of what matters		
Languages, Literacy and Communication	Expressing ourselves through language is key to communication		
Expressive Arts	Creating combines skills and knowledge, drawing on senses, inspiration and imagination.		

Resources

- Internet access
- Reference books
- Resource 6 12
- PowerPoint/Keynote (optional)

Vocabulary Territory Herbivore Crepuscular Mammal Species Presentation

Questions/discussion points

What makes a good presentation? Why?

What do you want others to know? How will you engage you audience? How are you going to make your presentation interesting?

Activity

Organise the learners into small groups of 3 or 4. Each group will work on one aspect of a presentation about Beavers in Wales. Learners may wish to use the headings provided in the resource sheets (**Resource 6 - 12**), or you could let the class decide on headings for themselves, e.g. appearance, features, natural habitat, diet, interesting facts...

Discuss what makes a good presentation and how long it should be (e.g. up to a minute for each group). Will they use a presentation software, e.g. PowerPoint/ Keynote? Identify the key stages of a presentation – greeting, introduction, main points in order of importance, conclusion. Decide on responsibilities for each group. Who is going to say what and how?

Ask learners how they will share their work. Will they invite another class to come and see the presentation, or present in a whole-school assembly? Will they wear their beaver masks/hats to present?

Provide time for groups to research, create their presentation and work on their delivery. They may also prepare visuals. Remind learners to make the presentation their own, original work and to be mindful of plagiarism. Share effective research strategies and remind learners to provide citations if required.

Once all groups have completed their preparation, the whole class can work together to decide the order in which each presentation will be shared.

After the whole class presentation, provide an opportunity for learners to offer constructive comments about their presentation. Did they work well together? Did they show knowledge and understanding about beavers? Did they use effective body language and eye contact? Did they communicate clearly?

Additional Activity

Support learners to create a quiz about beavers, linked to their presentation. They may use a game-based learning platform, e.g. Kahoot! or a coding tool such as Scratch/Scratch Jr to programme their own interactive quiz. They may wish to share the quiz with their audience at the end of their presentation.

Activity Nature's Engineers - Beaver Dam Challenge

In this activity, learners will turn their hands to creating a beaver dam, using a selection of twigs, hedge clippings and leaves.

Opportunities for learners to:

- Learn about beaver habitats
- Work as part of a group
- Recognise that there are connections between nature, climate change and human activity

Links to the Curriculum for Wales

Areas of Learning and Experience	Statements of what matters		
Humanities	Enquiry, exploration and investigation inspire curiosity about the world, its past, present and future.		
Science and Technology	Being curious and searching for answers is essential to understanding and predicting phenomena.		

Resources

- Outdoor learning area
- Logs/Branches
- Pine cones
- Leaves
- Rocks
- Mud
- Grass/plants/moss
- A shallow, rectangular container
- A jug/watering can
- Resource 13 Beaver
- Dam Challenge
- Stopclock/timer

Vocabulary

Dam Lodge Habitat Climate change Construction Drought Floods

Ouestions/discussion points

Why do beavers build dams? Where? How? How well does your dam hold water? Could you make it better? How would heavy rain affect a beaver's habitat? Why do you think that?

Activity

Beavers build dams to create living conditions where they are protected from predators. Dams slow the flow of water and create ponds which are ideal for beaver lodges. Dams also help with flood mitigation by slowing the flow of the water.

In small groups, challenge learners to put their engineering skills to the test by building their own dam. Share **Resource 13**. This activity should ideally be done outside, on school ground or in local area, e.g. park/forest. You will need to follow your school's health and safety guidelines in relation to the outdoor space that you will be using.

Encourage learners to make a dam by creating a channel in the ground or in a container, e.g. school drawer. Discuss as a whole class what natural materials a beaver may use to create it's dam, and note what the learners could collect to build their own beaver dam.

In pairs, ask learners to gather suitable materials outside to build their dam. Using their materials, challenge learners to build a dam across their container/canal. What materials will they use? Why? Will they mix materials together?

Provide opportunity for learners to test out their dams. Encourage them to use different materials in different combinations to see what happens.

Discuss what would happen in heavy rain, when the water flows guickly? Try adding water faster or slower to the dam to see what happens. Would happen to a beaver pond if there was a drought?

Ask learners to consider whether beavers could be useful in their local area? Why? If they were beavers, where would they build their dam? Why? Can they show you the location on a web mapping platform, e.g. Google Maps?

Additional Activity

A beaver dam can improve water quality within some water systems. Challenge learners use their dam construction to clean water? Ask them to put some leaves into their water and pour. What happens to the leaves/debris? Why?

Activity 5 **Beaver Board Game**

In this activity, learners will create and play a game about beavers. They will learn of the dangers and threats facing young beavers as they move to find a new territory.

Opportunities for learners to:

- Understand dangers and threats facing beavers
- Create a fun game to play with others
- Play and evaluate a game

Links to the Curriculum for Wales

Areas of Learning and Experience	Statements of what matters		
Expressive Arts	Creating combines skills and knowledge, drawing on the senses, inspiration and imagination.		
Languages, Literacy and Communication	Expressing ourselves through languages is key to communication. Languages connect us.		

Resources

- Internet access
- Reference books
- Resource 14 Game . board (Enlarge to A3)
- Resource 15 -Instructions Resource 16 - Activity
- Cards
- Resource 17 Blank cards (Enlarge to A3)
- Dice •
- Game pieces/counters
- Scissors

Vocabulary

Territory Danger Threat Habitat Survival Challenges

Ouestions/discussion points

What are the problems and threats facing young beavers? How could these dangers be prevented? Why would this work? Are there potential beaver habitiats in our community?

Activity

A beaver's family includes about five to six animals. Younger siblings usually stay with their parents for up to 2 years. During this time, they will learn how to collect food, build dams and help with infant care.

The problems start at the age of two! At this age, the beavers must leave their parent's territory, and begin their hard struggle for survival. Young beavers are often reluctant to leave and are frequently chased away by their parents.

Because habitats have changed, a young beaver may face several challenges when trying to find a new home. They may need to get through desolate stretches of water before finally arriving in a suitable area. They may come across unwelcoming territory owners, or even hydro-electric power stations or roads.

Ask learners to research the dangers that young beavers may face when they move out into the big wide world.

Share **Resource 14, 15 and 17** with the learners, and challenge them to create their own scenes of beaver life cards. They will need to create 6 positive cards and 10 danger cards. You may wish to share examples from Resource 16.

Learners can play the game, using their cards. They should start at the lodge, roll the dice, and move along the track accordingly. When they land on a 'heart' or "exclamation mark", they will need to draw a corresponding card, read it aloud, and follow the instructions. Each player can decide on their own way through the river system. Whoever reaches the end first, wins.

Additional Activity

Wanted: a new home! Ask learners to create an advertisement for a potential beaver habitat. They may wish to draw a picture of the habitat and include a description to persuade a beaver to move in. Is there a suitable area locally that they could photograph? Encourage learners to be as descriptive as they can.

Activity 6 Beaver Ecosystem

In this activity, learners will consider the important role a beaver can play in its ecosystem and discover how everything in nature is connected.

Opportunities for learners to:

- Explore food chains, food webs and energy exchange
- Visualise the concept of biodiversity interdependence
- Understand how beavers effect an ecosystem

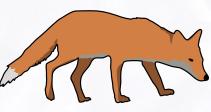
Links to the Curriculum for Wales

Areas of Learning and Experience	Statements of what matters		
	Our natural world is diverse and dynamic, influenced by processes and human action.		
Science and Technology	The world around us is full of living things which depend on each other for survival.		

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\mathsf{Sun} \longrightarrow \mathsf{Willow} \longrightarrow \mathsf{Beaver} \longrightarrow \mathsf{Fox}
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Resources

- Outdoor learning area
 or large hall
- Ball of stringResource 18a and 18b
- Connection Cards (Enlarge to A3)
- Sticks or chalk



Vocabulary

Organism Food web Ecosystem Interdependent Herbivores Carnivores Omnivores Decomposers

Questions/discussion points

Where do we get our energy from? Where does a beaver get its energy from? What is an ecosystem? How does the removal of the beaver effect the whole ecosystem?

Activity

This activity is best suited outside or in a large hall. Explain that all food chains start with the sun. Green plants use the sun's energy to make sugars in a process called photosynthesis. Ask learners to suggest a food chain that includes a beaver.

Ask learners to get into two groups of up to 15. Allocate one card (from **Resource 18**) to each learner. Ask the learners to consider what it is and how it would behave. Ask everyone who thinks they are a producer to raise their hand. Next, ask those who are consumers/herbivores to raise their hands, followed by secondary consumers/carnivores and top predators. Challenge each group to come together to make a complete food chain using 3/4 cards.

Next, ask both groups to form a large circle. Explain that an ecosystem is an interconnected web of living and non-living things in an area. Using string, ask learners to connect themselves to one another: what would their animal/plant eat? Who would eat them? How are they connected? Learners should explain the connection, and if the group agree, pass the ball of string, keeping the string taut.

Once everyone is connected in the food web, remove an animal and ask the children: what happens to the animals or plants that were connected to that animal? To further demonstrate how all species are interdependent, pose a scenario e.g. "a wildfire has destroyed all the trees from the area." Children should note that the food web will collapse if a part is removed and that every species in a food web is important.

Finally, each group can connect the web using natural materials such as sticks or use chalk to draw onto a tarmac surface. The learners should place their cards and work out the direction the energy flows from each living thing, drawing one or more arrows from each living thing to the ones that feed upon it. It is easiest if they start with the sun, followed by plants. Some learners may be able to identify and describe the process of decomposition and its importance in ecosystems.

Additional Activity

Ask learners to draw an energy pyramid with chalk or using sticks and include examples of producers (plants) in the bottom section, followed by primary consumers (herbivores), secondary consumers (omnivores/carnivores) and tertiary consumers at the top.

Activity 7 Beaver Reintroduction Debate

In this activity, learners will consider the advantages and disadvantages of reintroducing a beaver in their local area. They will take the role of different community members, considering the ethical and moral issues that the reintroduction of a species can raise.

Opportunities for learners to:

- Take on the role of different community members
- Present an argument
- Consider differing points of views

Links to the Curriculum for Wales

Areas of Learning and Experience	Statements of what matters
Languages, Literacy and Communication	Expressing ourselves through languages is key to communication. Languages connect us.
Humanities	Our natural world is diverse and dynamic, influenced by processes and human actions.

Resources

- Internet access
- Reference books
- Welsh Beaver Profile
- Resource 6-12
- Resource 19 For/ Against
- Resource 20 Role
 Cards
- Resource 21 Reintroduction Debate

Vocabulary

Extinction Population Predators Reintroduction Species Habitat

Questions/discussion points

Who would be involved in the reintroduction of beavers? Are there benefits to reintroducing beavers? Why do you think that? How can you play a role in making decisions in your community?

Activity

Ask the class why they think animals become endangered and what factors contribute to a species becoming extinct. Ask learners to remind you of the factors that led to beavers becoming extinct in Wales.

In pairs, ask learners to consider the statements in **Resource 19**, sorting statements 'for' and 'against' reintroducing beavers to Wales.

Explain to the learners that a wildlife conservation organisation wants to reintroduce beavers to a local stream. Explain that there will be a council meeting in the area to discuss the proposal, and that they will play the role of a community member at the meeting.

Ask each pair to choose a role from **Resource 20**. They will need time to research their role and consider what effect a beaver reintroduction may have on them. They may wish to use **Resource 21** to write a summary that includes their position and their research.

Set up a 'council meeting' and provide each group with an opportunity to present their argument for or against beaver reintroduction. Some roles may be impartial. A chairperson (teacher) should call the meeting to order and introduce the various representatives, ensuring that speakers keep to time and speak in the right order. The wildlife conservation representatives should open with details of the proposal. Where? When? How? Each pair should have up to 2 minutes to present with an additional minute to answer questions from other community members.

At the end of the meeting, learners can vote on whether they would support beaver reintroduction in the proposed area. Discuss the results with the learners. What are the difficulties with issues such as these?

Additional Activity

Learners can write a newspaper article or blog to share the outcomes of the meeting, or write a balanced argument, presenting both sides of the argument fairly.

Activity 8 History and Legends of Beavers

In this activity, learners will consider how beavers have been portrayed in the past. Learners will create their own river creature.

Opportunities for learners to:

- Consider how beavers have been represented in art and literature
- Reflect on what they know about beavers
- Create their own river creature, considering appearance, characteristics and how it has adapted to its habitat

Links to the Curriculum for Wales

Areas of Learning and Experience	Statements of what matters		
Humanities	Events and human experiences are complex, and are perceived, interpreted and represented in different ways.		
Languages, Literacy and Communication	Understanding languages is key to understanding the world around us. Literature fires imagination and inspires creativity.		

Resources

- Internet access
- Reference books
- Video clip: <u>youtu.be/</u>
- <u>yhws8t0crC4</u>
 Resource 11 Beaver
- Myths and Legends • Resource 22 - Llyn yr
- Afanc Legend
- Resource 23 River Creature
- Natural materials
- Air-drying clay or play
- dough.

Vocabulary

Dam Lodge Habitat Species Creature Portray

Characteristics

Questions/discussion points

How has the beaver been portrayed in the past? Why? What does your river creature look like? Can you describe its features? How has the river creature adapted to its habitat?

Activity

The beaver features in several Welsh myths and legends. See **Resource 11**. They are described in many ways, taking the form of a fearsome water monster, a fish, a crocodile and even a giant beaver. The earliest known surviving literary reference to the afanc is in a poem by the 15th century Welsh poet or bard, Lewys Glyn Cothi.

Share **Resource 11 and 22** and ask learners to consider how the beaver has been portrayed in legends, literature and poetry. Can they think of adjectives to describe the beaver illustration by Lleucu Gwenllian in **Resource 22**?

Share the video clip - <u>youtu.be/yhws8t0crC4</u>. Ask learner to discuss whether they believe beavers were fairly represented in the past? Why do they think they were portrayed this way?

Share **Resource 23** and encourage learners to create their own river creature. They should consider what they have learnt about beavers in their natural habitat as a basis for designing their own river creature.

Aspects for consideration may include:

- What size is the creature?
- What does it eat? Why?
- What habitat does it live in? Where does it shelter?
- How has it adapted to the environment?
- How does it defend itself? Who is its predator?
- What's its species' name?

Provide learners with natural modelling materials to create their new river creature species, based on their design. When they have completed their work, ask learners to evaluate their own model and their partners' model. Can they modify their model to improve it? What would happen if their creatures met each other?

Additional Activity

Their river creature could provide stimulus for story writing, a diary entry, portrait or a poem. Encourage the learners to be as creative as they can.

Activity 9 Biodiversity

In this activity, learners will be asked to create a scavenger hunt, including species that can be found in the school ground to share with others. They will also consider ways of attracting wildlife to the school ground.

Opportunities for learners to:

- Discover the variety of species that exist in the area
- Develop and implement ideas for how to increase biodiversity in the school ground
- Work collaboratively as part of a group

Links to the Curriculum for Wales

Areas of Learning and Experience	Statements of what matters		
Science and Technology	The world around us is full of living things which depend on each other for survival.		
Health and Well-being	Our decision-making impacts on the quality of our lives and the lives of others.		

Resources

- Outdoor learning area
- Internet access
- Reference books
- Plant and animal identification charts
- Seek by iNaturalist app
- Resource 12
- Resource 24 Scavenger Hunt

Vocabulary

Territory Lodge Biodiversity Environment Keystone Species

Questions/discussion points

What species can be found in your school ground? How can you enhance the physical environment at your school to attract local wildlife? What would you need? How could you achieve this?

Activity

Discuss the importance of biodiversity with the learners. Remind them that beavers are a keystone species, and that they can contribute to increasing the variety of species and ecosystems that exist in an area. See **Resource 12.**

Ask the learners to share what species they believe they may find in the school ground? Where would they find them?

Following the school's health and safety guidelines in relation to the outdoor space that will be used, ask learners to go outside in groups of 2-4, to find various species within the school ground that could be included in a species scavenger hunt.

Ask learners to draw or name different species in the blank squares provided in **Resource 24**. These may include a variety of animals or plants, such as insects, flowers, trees, birds, etc.

Learners may benefit from foldout identification charts or use of image recognition technology such as the Seek by iNaturalist app to help identify plants and animals that they encounter.

Once the groups have completed creating their scavenger hunt, ask groups to swap their work with another group. Can they find all the different species on the scavenger hunt within a set time? Where did they find them?

Ask learners to suggest ways of encouraging wildlife to visit the school grounds. How can they improve the school environment and increase biodiversity? Can they suggest ways to implement their ideas? This could include creating nesting areas, bug hotels, feeding areas or water sources.

Additional Activity

How about taking part in a citizen science project, such as the RSPB's Big Garden Birdwatch <u>rspb.org.uk/fun-and-learning/for-teachers/schools-wild-</u> <u>challenge/activities/big-schools-birdwatch/</u> or the OPAL Bugs Count Survey imperial.ac.uk/opal/surveys/bugscountsurvey/.

Activity 10 Beaver Outdoor Game

In this activity, learners will play a simple outdoor game, before being challenged to create and run their own outdoor game with their class, related to beavers.

Opportunities for learners to:

- Work with others as part of a team
- Develop running, speed and agility
- Communicate ideas, collaborate and solve problems

Links to the Curriculum for Wales

Areas of Learning and Experience	Statements of what matters			
Health and Well-being	Developing physical health and well- being has lifelong benefits.			
Mathematics and Numeracy	The number system is used to represent and compare relationships between numbers and quantities.			

Resources

- Outdoor learning
- Internet access
- Reference books
- Sticks

Vocabulary

Territory Communicate Instructions Strategy Adapt Recreate Invite

Questions/discussion points

What materials will you need? Why?

What strategies did you use when playing the game? Could you try anything else? Do you need to make any adjustments to the game? Why do you think this?

Activity

In a large outdoor area, place enough sticks on the ground so that there are at least two for each child.

Divide the class into two groups, named dams and lodges. Explain that the dams will need to place two sticks parallel (=) to create a 'dam', and the lodges will need to create a cross (x) with two sticks to represent a 'lodge'. Remind learners that they can only move sticks one at a time, and that they cannot take sticks from a dam/ lodge that has already been created. The team that has created the most dams or lodges when there are no remaining individual sticks remaining, wins.

Next, adapt the game by allowing each team to change each other's dams or lodges, depending on which they are, e.g. the dams (=) can change a lodge (x) to a dam. The team with the most lodges or dams at the end of a set time, e.g. 30 seconds, wins. Does this game remind them of another game? Learners may relate this to the game 'Cups and Saucers'.

In groups of 4-6, challenge learners to design and lead an outdoor game for their class to play. They can create their own game or recreate a game that they already know. How can you link the game to beavers?

Remind learners that they will need to share clear instructions with their class before they try the game out. How will they explain the activity? What materials will they need? Encourage learners to use natural materials.

Games such as tag, hide and seek, Simon Says, Tail tag games, and predator/prey tag could all be easily adapted.

Additional Activity

How about sending out invites to another class to come and play the new games? Remember to let them know where, when and what they will need to bring along with them.

Resource 1 - KWL Grid

Join me to find out more about beavers in Wales...

K	W	L	1
What I Know?	What I Want to Know?	What I have Learnt?	

Resource 2 - Connections







...a pair of swimming goggles

With a partner, discuss what you think I may have in common with the animals or items in these photographs ...



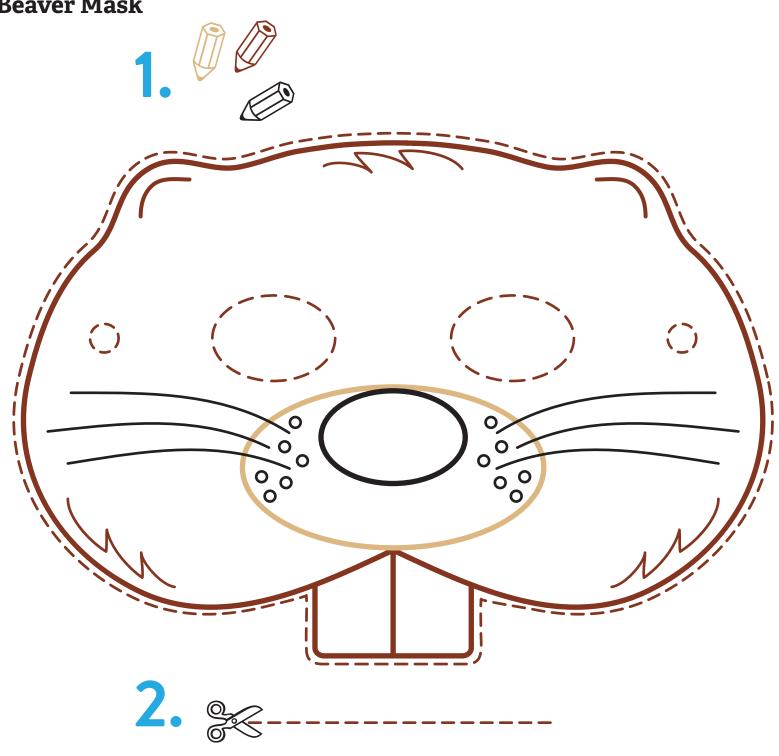


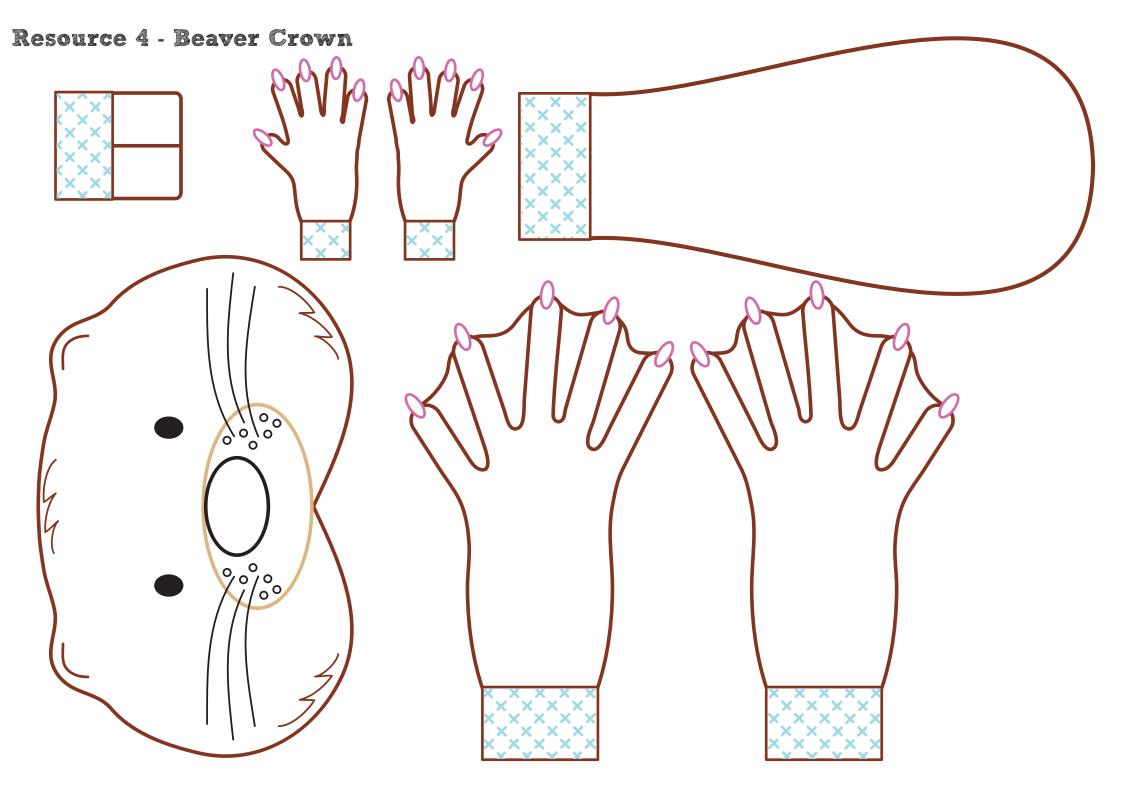




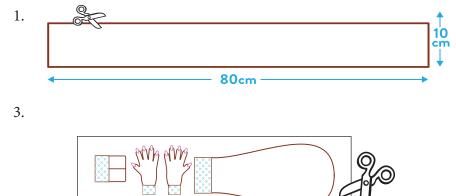
...a chainsaw

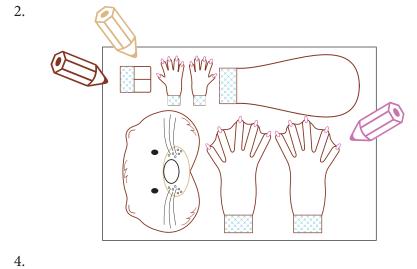
Resource 3 - Beaver Mask

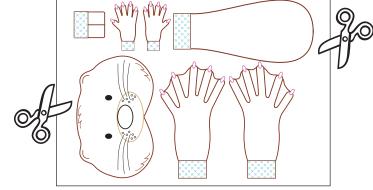


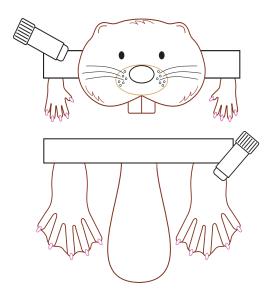




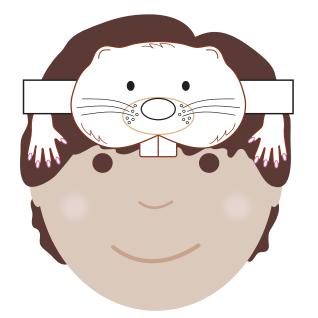


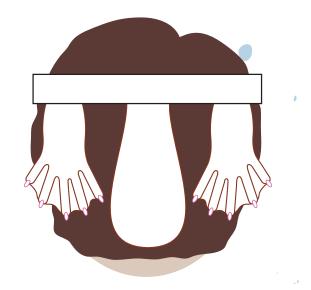






5.





Resource 6 - Welsh Beaver

Beavers in Wales





Questions What is a crepuscular animal?

How long do you think a beaver can stay underwater?

Useful links:

northwaleswildlifetrust.org.uk/welshbeaverproject/ northwaleswildlifetrust.org.uk/wildlife-explorer/mammals/ beaver

wildlifetrusts.org/saving-species/beavers scottishwildlifetrust.org.uk/our-work/our-projects/ scottish-beavers/ beavertrust.org/

Adaptation

Beavers are rodents, a group of mammals which include mice, rats and other small gnawing animals. Like all rodents, a beaver's teeth continue to grow their whole lives.

There are two species of beaver in the world: North American Beaver *(Castor canadensis)* and Eurasian Beaver *(Castor fiber)*. Although they are distinct species, they are almost identical in every way.

Beavers pair for life and have one litter per year. A baby beaver is called a kit. A kit will stay with its family until it is around 2-3 years old.

Beavers live in families, typically the adults and up to two generations of offspring. The families defend their territories. Beaver will slap their tails on water to signal danger to other beavers. The life expectancy of a beaver is around 10 plus years.

Beavers know how to walk and swim when they are born. They have two layers of fur to keep warm. They have an orange coating on their teeth to protect them from damage.

Beavers are crepuscular animals, being active primarily at dawn and dusk. They are semi-aquatic and have many features that help them to swim and gather food under water.

Beavers spend a lot of their time grooming to keep their fur in good condition to ensure it remains waterproof and to help keep themselves warm. They have a strong paddle-shaped tail that helps them to swim and webbed rear feet to help push through the water. They also have an extra pair of eyelids that helps them see under water.

Resource 7 - Welsh Beaver

Beavers in Wales

Useful links:

northwaleswildlifetrust.org.uk/welshbeaverproject/ northwaleswildlifetrust.org.uk/wildlife-explorer/mammals/ beaver_

wildlifetrusts.org/saving-species/beavers scottishwildlifetrust.org.uk/our-work/our-projects/ scottish-beavers/ beavertrust.org/

History

Prehistoric evidence of beavers in Wales consist of beaver bones, such as skulls and teeth, fossils and beaver gnawed wood.

After the last Ice Age, Eurasian Beavers were widespread across Wales. Literature, historical records and place names relating to beavers suggest this.

In the 10th century, Hywel Dda, King of Wales specifies in the Law that beaver skins are royal privileges. These laws were the first written record of beavers in Wales. Written records from the 12th Century say that there were beavers on the river Teifi, at Cilgerran in Cardiganshire.

Due to overhunting by humans for their fur, meat and scent gland, beavers became extinct by the Middle Ages in Wales. Their warm, dense pelt was used to make waterproof hats. Castoreum from the scent gland at the base of a beavers' tail was used as a general remedy or painkiller.

Habitat loss could have also contributed to the loss of beavers.

By the late 19th century, there were only around 1,200 beavers left across Eurasia. They existed mainly in Norway, Germany, France and Belarus. However, their near extinction was reversed through a series of conservation measures, including legal protection and the reintroduction of beavers to over 25 European countries.

Today, beavers are back in many areas across Britain, including parts of Scotland, England and Wales.

Resource 8 - Welsh Beaver

Beavers in Wales



Questions What do beavers eat?

What are herbivores, omnivores and carnivores?

Useful links:

northwaleswildlifetrust.org.uk/welshbeaverproject/ northwaleswildlifetrust.org.uk/wildlife-explorer/mammals/ beaver wildlifetrusts.org/saving-species/beavers

scottishwildlifetrust.org.uk/our-work/our-projects/ scottish-beavers/

<u>beavertrust.org/</u>

Diet

Beavers are herbivores and prefer to eat leaves, herbs, bark, twigs, roots, and aquatic plants. Contrary to popular belief, they do not eat fish.

A beaver's diet changes in different seasons. In the summer months they eat grass, leaves and aquatic plants. In the winter, they eat tree bark from trees like aspen, willow, birch and rowan.

Beavers fell broad leaved trees and bushes to reach upper branches to eat during the winter and for construction of lodges and dams.

Should it prove necessary, beavers can be prevented from damaging trees by fencing, applying sand paint or using wire mesh around individual trunks.

During the winter months, beavers store food under water in a cache. As a result, beavers do not hibernate during winter months.

Beavers forage close to water, usually around 20 meters of the water's edge. They build dams and canals to create suitable living conditions and to provide routes to and from food sources.

Beavers often eat in their lodges and they have a food store outside of their lodge to keep them going during winter months.

Beavers have been known to eat agricultural crops, including maize and roots such as sugar beet when these are grown next to water courses. Management options can address situations such as these, such as mesh or electric fencing.

Resource 9 - Welsh Beaver

Beavers in Wales

Catch up with the beaver family at Cors Dyfi:

<u>youtube.com/</u> <u>playlist?list=PLDfZStW-</u> <u>stoZOqwk2hwt8ECtrAUec6r5</u>

Useful links:

northwaleswildlifetrust.org.uk/welshbeaverproject/ northwaleswildlifetrust.org.uk/wildlife-explorer/mammals/ beaver_

wildlifetrusts.org/saving-species/beavers scottishwildlifetrust.org.uk/our-work/our-projects/ scottish-beavers/ beavertrust.org/

Habitats and Homes

Beavers like to live near water. They feel safe and move easier in water. They generally do not like being more than 20 meters away from water. It's also usually safer for beavers to travel by water than on land. They are slow on land and their eyesight is poor. They can stay under water for up to 15 minutes.

Their territory size is dependent on food availability, but usually ranges from 1-7km. 95% of their activity is usually within 5m of the water's edge, with 98% of activity within 20m.

Beavers mark their territories with castoreum, from a scent gland at the base of their tail.

Beavers are known for felling trees, which are used for building and feeding.

A beaver's home is called a lodge. It is usually around 1-2m in height and has a secret underwater entrance and exit. Otters will sometimes move into disused beaver lodges. Water voles are happy to share a lodge with beavers.

Beavers have canals to go from one territory to another.

Beavers build their own dams out of mud and sticks. Their dams can help to clean rivers and lakes. Beavers usually build their dams in smaller streams or tributaries. They may also make their way into low lying floodplains.

Beavers are now protected in most countries, and it is against the law to kill or trap them or disturb their breeding areas.

Resource 10 - Welsh Beaver

© ALICIA LEOW-DYKE

Feeding sign

Beavers in Wales



Beaver Dam © ALICIA LEOW-DYKE

Catch up with the beaver family at Cors Dyfi:

> youtu.be/Cz_PyG6W1u8 youtu.be/9cS3zatFP88

Useful links:

northwaleswildlifetrust.org.uk/welshbeaverproject/ northwaleswildlifetrust.org.uk/wildlife-explorer/mammals/ beaver

Tracks and Signs

Beavers are crepuscular animals and are not often active during the day. As a result, it can be difficult to see beavers in the wild.

In order to discover where beavers live, you will need to look for signs that they are near.

A spotter's guide may include:

Beaver lodge - beavers build their homes, called a lodge, by piling sticks on the banks of a pond or river.

Beaver Dam - beavers build dams across streams, using sticks, branches, logs, stones, mud and plants. This can raise the water level and turn a stream into a pond.

Tracks - Beaver tracks may be found in the mud near their pond. They have small front feet and larger webbed hind feet.

Coppiced trees - Beavers gnaw bark off tree trunks, turning their heads sideways and bringing their four incisors together. These make incisor bite marks in the wood. There may also leave woodchips.

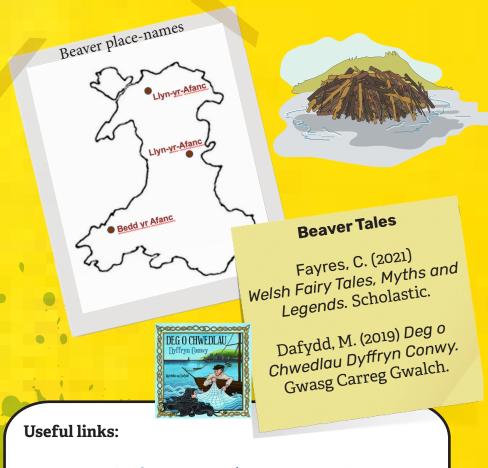
Beaver canals - Beavers dig ditches and canals so that they can travel from place to place. These will go from their pond into nearby meadows or woods.

Scent mounds - Beavers mark their territory with smells or scents.

Beaver cache - beavers will cut down branches and store them at the bottom of a pond near their lodge. During winter months, they will eat these.

Resource 11 - Welsh Beaver

Beavers in Wales



northwaleswildlifetrust.org.uk/welshbeaverproject historic-uk.com/HistoryUK/HistoryofWales/The-Legendof-the-River-Conwy-Afanc/ geograph.org.uk/photo/404509 llangorsetri.wordpress.com/the-afanc/ youtube.com/watch?v=V2EJ2H9y9S8

Beaver Myths and Legends

The Afanc (beaver) has been referred to as mythical lake monster in Welsh mythology. According to legend, the afanc would attack and devour anyone who entered its waters. They are described in many different ways; taking the form of a fearsome water monster, a fish, a crocodile and even a giant beaver.

Bedd-yr-Afanc means the monsters grave. The grave is the only Bronze Age gallery grave (a form of megalithic tomb) in Wales and dates from around 1500BC. Two rows of parallel stones have survived. According to legend the Afanc used to live in a pool by Brynberian Bridge, Pembrokeshire, before it was was captured, killed and then buried in this mound on the hillside.

The earliest known surviving literary reference to the afanc of Llangors is in a poem by the 15th century Welsh poet or bard, Lewys Glyn Cothi (English translation by John Rhys):

Yr avanc er ei ovynThe afanc am I, who, sought for, bidesWyv yn llech ar vin y llyn;In hiding on the edge of the lake ...

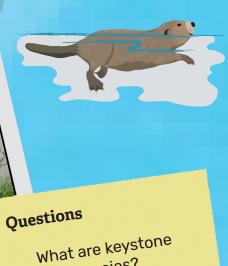
The Afanc appears in the legend of the River Conwy Afanc, where it was captured from a pool in the river Conwy and led to Llyn Ffynnon Las lake, (now known as Llyn Glaslyn) far away on Yr Wyddfa (Mount Snowdon). According to legend, the afanc was responsible for causing floods and for devouring a small child, humans and animals. The afanc was enticed out of the pool by a young girl before fellow villagers bound the creature in chains. Furious, it was dragged away by oxen to the lake in Cwm Ffynnon.

Similarly, legend has it that the people of Aberdyfi were plagued by a fierce water monster named 'The Afanc'. King Arthur dragged the afanc from the lake using a magical chain tied to his horse.

Resource 12 - Welsh Beaver

Beavers in Wales





species?

How do beavers protect

the environment?

Useful links:

northwaleswildlifetrust.org.uk/welshbeaverproject/ northwaleswildlifetrust.org.uk/wildlife-explorer/mammals/ beaver wildlifetrusts.org/saving-species/beavers scottishwildlifetrust.org.uk/our-work/our-projects/ scottish-beavers/ beavertrust.org/

Environmental Benefits

Beavers are a keystone species. They can provide a range of environmental benefits and help define an entire ecosystem. They are often referred to as 'ecosystem engineers' due to their ability to modify the habitats and landscapes they live through coppicing, feeding and damming.

Ponds created from damming can promote growth of aquatic vegetation, and create a habitat for invertabrates, which in turn encourages greater amphibian and mammal life - including otter, water vole, frog, newt and dragonfly.

The coppicing of trees and other vegetation reduces canopy cover, creating further habitat diversity. Dead wood and increased light levels encourage growth of under-storey plants and aquatic flora as well as a growing abundance of invertebrates. This provides further benefit to a wide range of species including birds such as heron, duck, woodpecker and kingfisher.

Climate change is the biggest issue future generations face, and beavers are already playing their part in tackling climate change.

Dams created by beavers can help reduce flooding, by slowing down the water and and evening out the throughput of water following heavy rainfall. They filter and clean the water, which can improve the water quality. Oxygenation of water flowing over dams and retention of polluted silt also improves water quality, which again leads to an increase in invertebrate life forms.

Wetland habitats created by beavers can capture carbon. Wetlands are extremely efficient at pulling carbon dioxide out of the atmosphere and converting it into living plants and carbon rich soil.

Resource 13 - Beaver Dam Challenge

Can you build a dam like me? Design, build and test your construction skills.

Ready... steady... build!





You will need:

A shallow, rectangular,

- waterproof container A jug/watering can
- Selection of natural
- dam-building materials Stop clock/timer/watch



© NORTH WALES WILDLIFF TRUST

Step-by-Step Instructions

- 1. Head outside, and set up a container with a slight slope to it, or you may wish to dig your own canal.
- 2. Pour water from the higher end and watch it flow down the slope and collect at the other end.
- 3. Gather natural materials for dam-building. What materials will you use?
- 4. Build a dam across the middle of your 'stream'. How will you construct your dam?
- 5. Slowly pour water in at the top of your slope. How long does it take for the water to arrive at the other end? Does it all get through? Does the water level change above the dam? Did the water break your dam?
- 6. Can you improve your dam so that it holds water for longer? Try using different materials in different combinations to rebuild and test your dam. Time how long it takes using different combinations.
- 7. Put some leaves or debris in your water, and pour in at the top of your slope. Can you use your dam construction to clean the water? What happens? Do the leaves get through?



Resource 15 - Beaver Game Board Instructions

Beavers have to leave their parents' territory at around two years old.

Can you create your own cards to show the dangers and threats facing these young beavers?

You will need:

- Game pieces
- Resource 14 Game Board
- Resource 17 Blank Game
- Cards Resource 16 - Beaver
- Game Cards

Rules

- The game begins at the beaver lodge. (Top left)
- Roll the dice and move along the track.
- When you land on a or draw a corresponding card, read it aloud and follow the instructions.
- Whoever reaches the end first. wins.



Step-by-Step Instructions

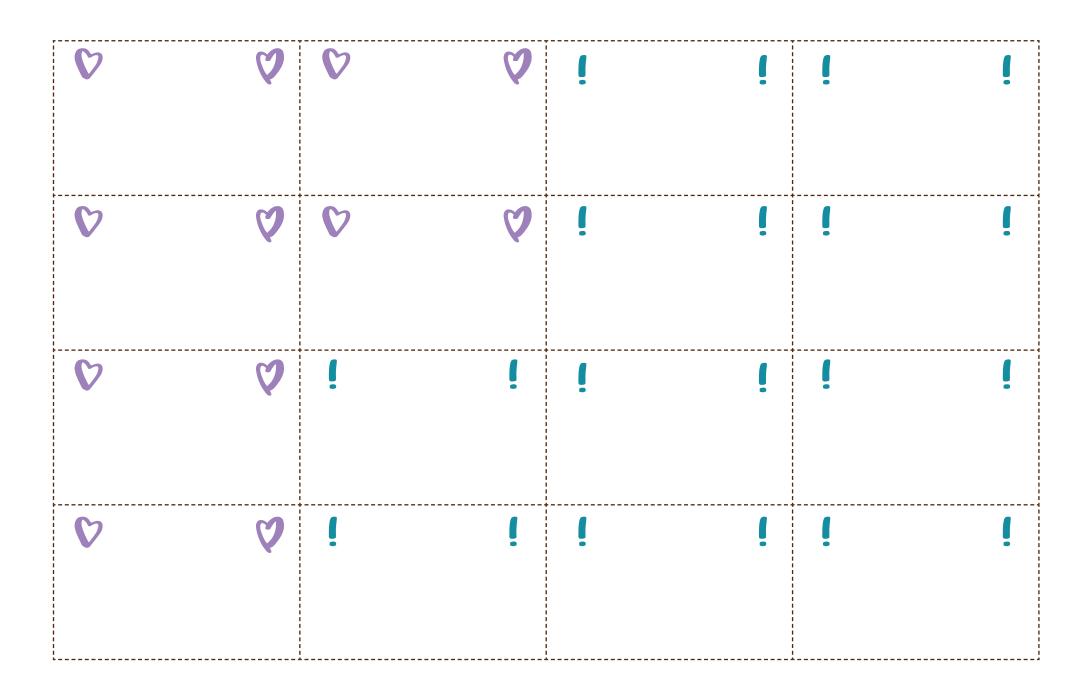
- 1. Copy the game board. (Enlarge to A3)
- 2. Research the dangers that may face young beavers when they move out into the big wide world.
- 3. Create your own scenes of life beaver cards (**Resource 17**). You will need to create 6 positive cards and 10 danger cards (see **Resource 16** for examples). Put the completed cards face down, and place near the game board. You may wish to put a **V** or **I** on the back of each card.
- 4. Once you have prepared your cards and game board, enjoy playing the game.
- 5. Remember to keep to the rules and wait to take your turn patiently. Roll the dice and move your own game piece along the track carefully.
- 6. Have fun!



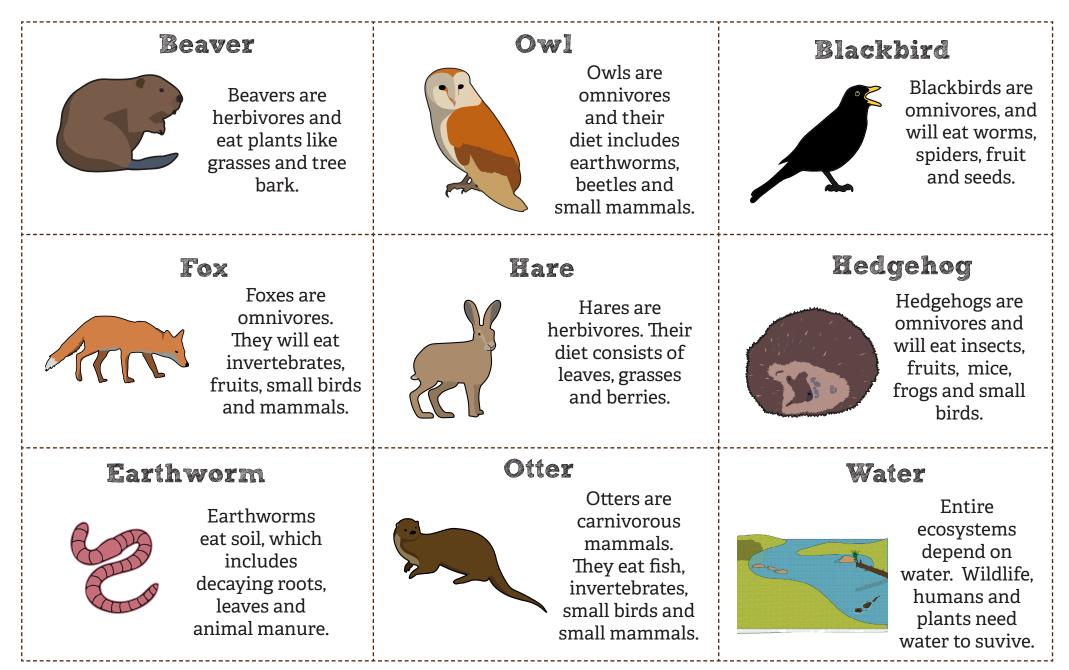
Resource 16 - Beaver Game Cards

V Treat	V	💙 Rain	01	Tricky situation		Poacher
You enjoy a corn		It rains and the wate		u're stuck in the m	ud	You are being shot at
from a nearby field quick prog		rises. You make g progress	000	Go back 1 space		illegally! You dive into the water immediately to hide
Move forward	3 spaces	Move forward 1 sp	aces			Skip a turn
V Hygiene	÷ 💙	Shortcut	01	City ahead		Road
You grease you swim faster as		You discover a faster and make quick pro		way leads to the ci are afraid of huma	· ·	You have to cross a road!
						Roll again 1 - 3 You're lucky, move 1 space
Move forward [•]	l spaces	Move forward 3 sp	aces Ba	ack to the previou junction	IS	forwards
						4- 6 A car hits you, you're out
Feast		Fox		Another beaver	ļ	Hunger
You find tasty the river bank a		A fox finds you, you e back into the wat		area is already occu the other beaver ch	•	You swim in a canal and find nothing to eat
faster as a re				you away	ases	nothing to eat
Move forward 2	2 enaces	Go back 2 space		Go back 2 spaces		Back to the previous junction
Move for ward 2	spaces			ou back 2 spaces		Junction
V Willow tr	es 💟	Dry season	[[Dog	l	Timber
You enjoy nibbling		Water levels have g		og is attacking you,	you	You fell a tree, but it gets
trees. Now that y you make quick		down and you make progress	3 SIOW	quickly escape		stuck in other trees. You get help from other beavers
,				Go back 3 spaces		•
Move forward 3	-	Skip a turn		•		Skip a turn

Resource 17 - Blank Game Cards



Resource 18a - Connection Cards



Resource 18b - Connection Cards



Badger

Frog

Badgers are omnivores and eat eathworms, insects, small mammals, seeds and berries.

Red Admiral



Butterflies are herbivores. They drink nectar from flowers. As caterpillars, they eat leafy greens and grasses.

Red Kite



Frogs are carnivores. They eat insects such as flies and moths, as well as invertebrates such as worms.

R

 Red Kites are carnivores and scavengers. They feed on small mammals such as rabbits, hares, mice, voles and invertebrates.

Grass snake

Grass snakes are carnivores. They prey mainly on amphibians, such as toads or frogs.

Grasses



Grasses produce their own energy from sunlight. They need water and nutrients from the soil to grow.

Sun



The sun provides energy in the form of light, called solar energy.

Trees



Trees need water to survive. They produce their own food through photosynthesis, using energy from sunlight.

Wood mouse



Mice are omnivores. They eat plants, grains, insects, bark and even other small animals.

Resource 19 - For/Against

			· · · · · · · · · · · · · · · · · · ·
Beavers introduced from other countries could carry diseases that may be harmful to the wildlife in Wales.	It is expensive to reintroduce species.	Beaver reintroduction may increase levels of tourism in the area, which could boost the local economy.	Dams created by beavers can cause unwanted flooding in fields and areas surrounding rivers.
Beavers fell trees for food and to build dams or lodges. This can open up the woodland canopy allowing other plant species to grow because extra sun light can reach the ground.	Humans have a moral duty to protect animals. Beavers are a part of our national heritage.	Beavers can eat farm crops and vegetables from nearby fields, such as maize.	Beaver dams can clean water and reduce pollution by trapping silt and storing sediment, nutrients and pollutants in their ponds.
Beavers can reduce the risk of flooding by increasing the ability of the landscape to absorb and retain water, which reduces peak flow downstream.	Beavers can tackle drought by slowing the flow of water and retaining water in wetlands.	Beavers are a keystone species, and can promote an abundance of wildlife in their habitat, especially insects.	Beaver dams can provide spawning grounds for fish as well as a hiding place from predators.
Beaver dams can sometimes be a barrier to fish travelling upstream.	Beavers can help tackle climate change. Wetlands created by beavers are carbon sinks, increasing carbon stored in the area.	Felled wood provides homes for invertebrates.	Increasing the tourism level to areas where beavers live may cause more pollution and littering issues.

Landowner	Farmer	Angler	Member of the Public
Local Councillor	Natural Resources Wales employee	Hotel owner	Road and railway employee
Student	Wildlife enthusiast	Conservation organisation employee	Farming Union employee
Hiker	Fireman	Teacher	Forester

Resource 20 - Beaver Reintroduction Role Cards

Resource 21 - Beaver Reintroduction Debate

A local council meeting has been arranged for members of the public to find out more about the proposed reintroduction of beavers in your area.



What is your role in the community?				

How may beavers affect you?

Do you believe beavers are important to your local environment?

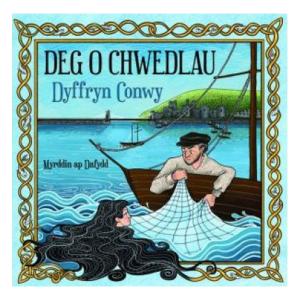
What questions do you have for the other community members?

Resource 22 - Llyn yr Afanc

Here is a picture by the Welsh illustrator Lleucu Gwenllian.

It appears in the book **Deg o Chwedlau Dyffryn Conwy** by Myrddin ap Dafydd. The frightful beaver appears in the tale 'Llyn yr Afanc'.

Do you think it's a fair representation of beavers like me?





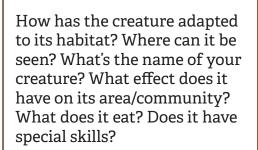
Resource 23 - River Creature

Design your own river creature. Describe your creature and include facts about how it has adapted to living in its habitat.



Adjectives: (e.g. What does it look like? What kind of personality does it have?)

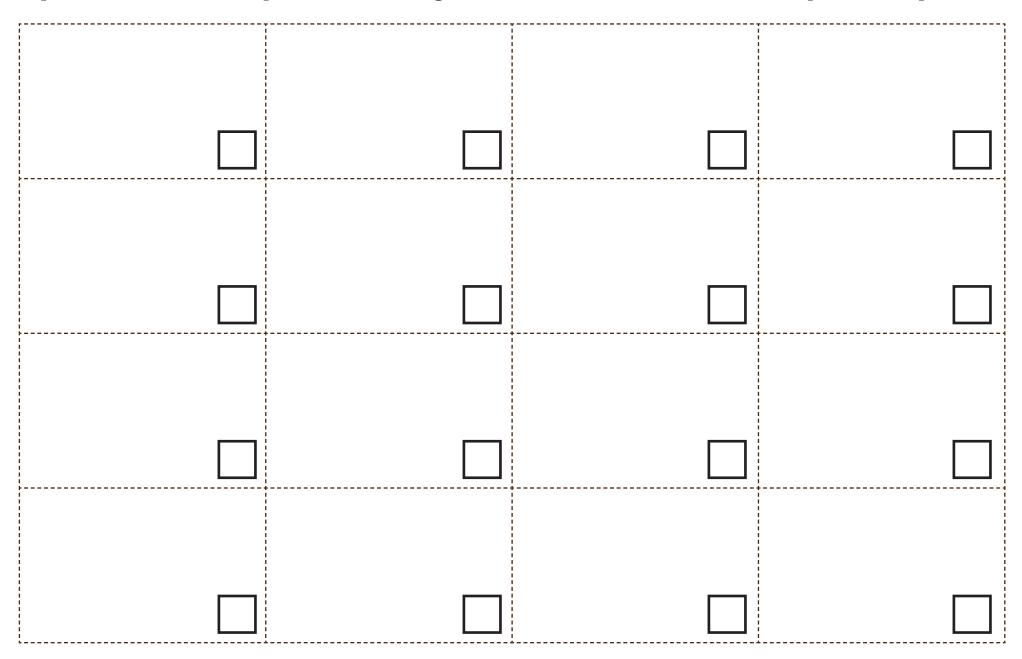
Picture:



Interesting facts:

Resource 24 - Scavenger Hunt

Draw or name different species you can find in the school ground in the blank squares below. Swap your work.
 Can you find all the different species in the scavenger hunt below? Tick the box next to each species when you find it.



Welsh Beaver Project School Visits

The Welsh Beaver Project can also deliver educational outreach to primary schools in Wales, based on the activities within this Beavers in Wales education pack. Please contact us on beaver.afanc@northwaleswildlifetrust.org.uk if you would like to find out more or arrange a school visit* from the Welsh Beaver Project.

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TRUST





North Wales Wildlife Trust, together with members, volunteers and supported by a growing network of thousands of people in diverse communities, is committed to bringing wildlife back, empowering people to take action for nature, and to create a society where nature matters.

We're part of a national network of 46 Wildlife Trusts across the UK. We campaign to protect wildlife and habitats both locally and nationally.

North Wales Wildlife Trust is a driving force for nature conservation - and we want you to be part of it!

EMAIL FACEBOOK WEBSITE TWITTER INSTAGRAM info@northwaleswildlifetrust.org.uk northwaleswildlifetrust northwaleswildlifetrust.org.uk @North_Wales_WT @northwaleswildlifetrust

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*Please note that school visits will be subject to availability and where capacity allows as we are a small team, but we will endeavour to support you where we can.

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