

This education pack was produced by two long standing partnerships, the Pen Llŷn a'r Sarnau SAC and the Llŷn Partnership, with contributions from a wide range of additional partners.



FOR MORE INFORMATION AND EXTRA RESOURCES

VISIT OUR WEBSITE: WWW.tiramor.cymru

OR EMAIL US AT: info@penllynarsarnau.co.uk

X

f





# Welcome

In Wales we are lucky enough to have a huge variety of habitats within our borders. Our mountains are some of the highest in the UK; we still have areas of ancient woodland, blanket bog and coastal heath, to name but a few.

These habitats are incredibly scarce in other parts of the UK. Wales' importance can be seen by the numerous protections and designations it has. There are three National Parks, five Areas of Outstanding Natural Beauty, twenty Special Protection Areas for vulnerable birds, ninety two Special Areas of Conservation and hundreds of nature reserves and Sites of Special Scientific Interest.

This wealth of habitats is home to thousands of species - some of which are unique to Wales. So much of our health, well-being and economy depends on our ecosystems remaining healthy and resilient to change. Our terrestrial ecosystems provide us with most of our food and a lot of the raw materials that power our industries and fuel our economy. Healthy well functioning terrestrial ecosystems help clean our air and protect us against hazards, such as flooding and climate change. Now more than ever it is important that we all gain more understanding and respect for the natural habitats we live alongside.

### How to use this pack

Each topic begins with a basic introduction and ideas for further study. Every activity within that topic starts with the teachers' guidance sheet and then the learners' worksheets. (These can also be found as separate sheets to be printed directly from the electronic resources).



### Where to get more information

This printed pack is intended to act as a starting point for a much bigger collection of activities that will regularly be updated. These resources will be made available on **www.tiramor.cymru** as they are created and further physical additions will be issued as and when funding becomes available. All activities are available as separate downloads on the website.

### **Activities Overview**

#### This provides an overview of all the activities provided in this printed edition of the Land booklet.

The progression steps are to be used as a guide, all the activities can be expanded by the teacher to cater for varying levels of abilities and interests. Most activities can be done year round but if there are any that require a specific season they are shown on the activity sheet.

	ТОРІС	PROGRES STEP	SION OUTDOOR INDOOR
Safe Place Game	Habitat Loss	PS 1/2	EITHER
Habitat Match	Habitat Loss	PS 3	INDOOR
Corridors	Habitat Loss	PS 3/4	INDOOR
Regenerating our World	Habitat Loss	PS 3	INDOOR
Build a Bug Hotel	Hibernation	PS 2/3	OUTDOOR
Hibernation Match	Hibernation	PS 3	INDOOR
Hibernation Challenge	Hibernation	PS 2/3	OUTDOOR
Why Hedgehogs Need Help	Hibernation	PS 3	INDOOR
Heathland Hunt	Choughs	PS 2/3	OUTDOOR
Legends	Choughs	PS 2/3	INDOOR

#### Other booklets in this series:



- Invasive Species
- Water Cycle
- Water Quality



#### Sea

- Strandline
- Food Chains
- Plastic Pollution
- Seagrass
- Pink Sea Fan
- Native Oysters
- Wildlife Recording

Check online for new activities: www.tiramor.cymru

# Habitat Loss

### Habitat Loss

Over time species become adapted to the environment they live in. The natural home of a species is called a habitat. Habitat is lost when the environmental conditions no longer support the species that were adapted to it. This can happen due to a number of factors including pollution, climate change, deforestation, development and intensification of agriculture.

Changes to conditions or complete loss of a habitat mean that species lose their niche and they will then have to compete with species they would not normally compete with for food and shelter. They may have to deal with predators that they would not normally encounter. These new stresses mean that populations are likely to decline.

Habitat loss in one area can put extra pressure on habitats in other areas. Each habitat can only support a certain number of individuals. If populations move from one area to another they still might not thrive because the existing population will be using all of the resources.

A healthy environment consists of a mosaic of habitats, where animals can move freely between them. This stops populations becoming isolated and inbreeding. As habitats become more fragmented these 'green' corridors become increasingly important. They allow species to move between areas of appropriate habitat and enable them to fulfil all of their survival needs.

Rewilding is the process of protecting an environment and returning it to its natural state, for example, by bringing back wild animals that used to live there. Rewilded landscapes are the opposite of food-producing farming but can be implemented on a small scale to encourage native, keystone species and apex predators, that occupy the top of the food chain. Brownfield sites such as landfill areas can be rewilded to help establish a more diverse and mosaic habitat and transform these areas into restorative nature reserves.

Regenerating is the process of restoring and improving an environment and helping it return to a healthier, more natural state, for example, by supporting the return of native species and creating diverse habitats. Regenerated landscapes may not be fully wild but can provide spaces where nature and people coexist, helping ecosystems recover.

### **Interesting facts!**

- Around half of the world's original forests have disappeared. They are still being removed at a rate 10x higher than any possible level of regrowth.
- Habitat loss poses the greatest threat to species worldwide.
- In the UK farmland birds have declined by 56% between 1970 and 2015.
- Only 12% of woodland in Wales is ancient and semi-natural, and much of it is degraded and fragmented.
- Wales has lost 30% of its sand dunes since 1900.

#### Further research keywords

State of Nature report, extinction vortex, wildlife corridor, toad crossing, green bridges, habitat mapping, mosaic habitat, regeneration, degraded landscapes, keystone species, apex predators, nature-based economies, ecosystem services, habitat restoration.

30 mins

### Safe Place Game

### **Equipment required**

- Hula hoops or floor mats
- Whistle

#### Before the game

1. Spread hula hoops or mats around the game area to represent the animal habitats.

#### To play the game

1. Explain that animals use their habitats as a refuge to keep them safe from predators.

2. Encourage learners to run around the game area acting as if they are feeding.

3. When the whistle blows, this means danger. All the learners must get to the safe habitat before the whistle stops.

4. Anyone who hasn't made it into the safe areas are out and have to sit on the side.

5. In every round, mats / hula hoops are removed, making fewer safe places and further apart.

6. The effects of habitat loss can then be talked about and learners can discuss how much harder it was to get to safety as the habitat disappeared.

PS: 1/2

**Habitat Match** 

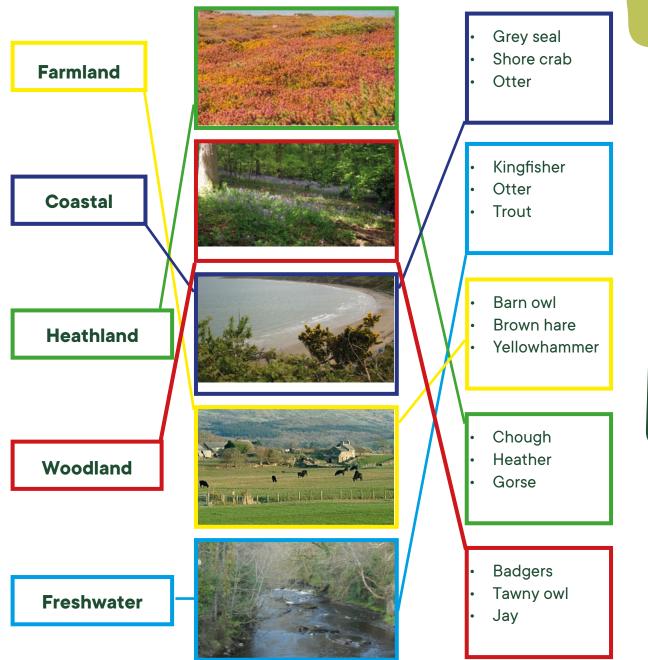
#### **Equipment required**

• Print out of the 'Habitat Match' worksheet, one per learner

#### To complete the activity

1. Support learners to complete the worksheet.





PS: 3

# Habitat Match

**Game rules:** Match the habitat name to the photo and some of the species that live there by drawing a line between them.

### Farmland

Coastal

Heathland

Woodland

### Freshwater





The total size of all the UK's gardens is bigger than all our National Nature Reserves. • Grey seal

- Shore crab
- Otter
- Kingfisher
- Otter
- Trout
- Barn owl
- Brown hare
- Yellowhammer

### Chough

- Heather
- Gorse
- Badgers
- Tawny owl
- Jay

### Corridors

### **Equipment required**

- Print the two 'Corridors' worksheet for all learners
- Coloured pencils or pens
- Scrap paper

#### To complete the activity

1. Explain that animals use their habitats for different things and being able to move between different areas is very important.

2. Support learners to begin work on their worksheets, trying to find a way to fit different land uses in whilst still allowing travel between habitat areas.

3. Encourage learners to invent and draw ways for the animals to cross any features that block their route.

PS: 3/4

# Corridors



Wildlife corridors are a way of keeping areas of habitat connected even when development cuts off areas that were previously linked. They allow animals to move safely across large areas. They can take many forms including; hedgerows, road verges, field margins and urban gardens.

#### Game rules

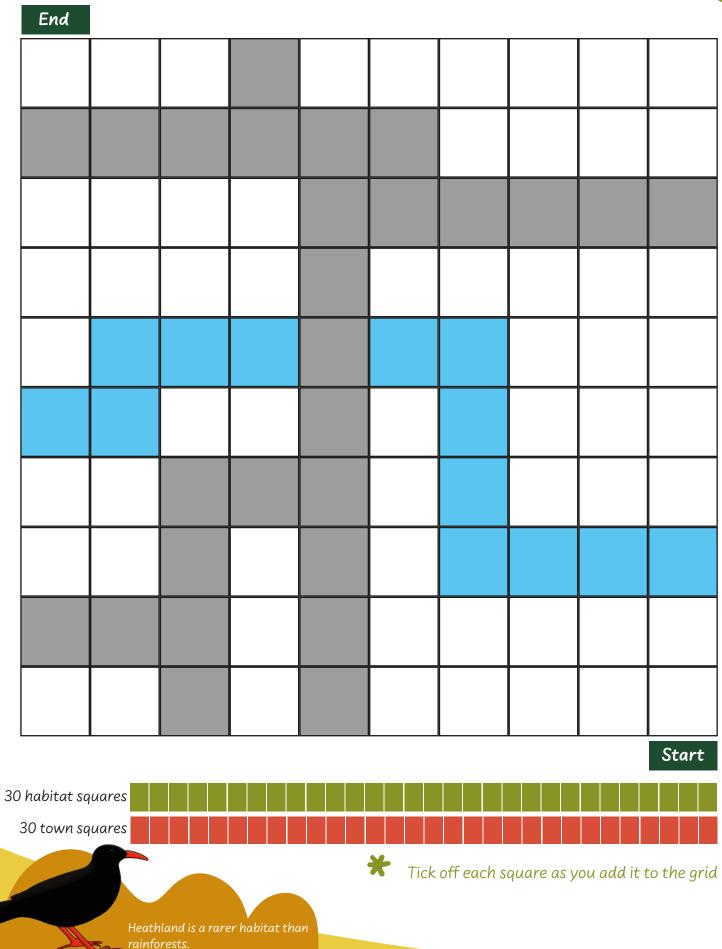
- The grid already contains roads and rivers.
- You must add 30 green habitat squares and 30 red town squares to the grid.
- You need to make sure there is a green path from the start to the end that animals can follow safely.
- You can move between squares that are next to each other, but not diagonally.
- Whenever your route has to cross a road or a river you must invent a safe way for animals to cross it.

Draw and describe your invention below:





### Corridor Game Board





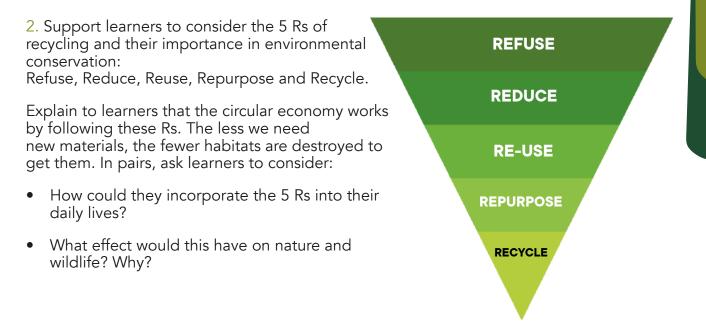
### Regenerating Our World

#### **Equipment required**

- Print out the 'Lost and Found Creatures' sheets (L\_HL\_1), one per group
- A variety of recyclable and non-recyclable items (cardboard, plastic bottles, paper, food scraps, food wrappers, plastic toys etc.)
- Recycling boxes or trays (labelled: paper, plastic, metal, glass, cardboard)
- Scissors
- Glue, tape or other adhesives
- Large sheet of cardboard or paper, one per group
- Paint, crayons, coloured pencils or markers
- Internet enabled device and internet access

#### To complete the activity

1. Before learners arrive, scatter recyclable and non-recyclable items around the classroom. Ask learners to help you sort the items into correct boxes/trays (paper, plastic, metal, glass, cardboard), explaining their choices. Encourage discussion about why certain items can be recycled and others cannot. Explain that every product we use—whether it's plastic, metal, or cardboard—comes from nature. These resources are taken from habitats like forests, rivers, and oceans, which can harm wildlife. That's why we talk about a circular economy— an economy where we keep materials in use for as long as possible, so we don't keep destroying natural habitats to get new resources.



PS: 3



3. Explain to learners that Landfills are part of the linear economy. When we throw things away, they go to landfill, which takes up land where wildlife used to live. If we follow the circular economy, we keep items in use, which helps prevent land from being turned into landfill and protects wild habitats.

4. Share the video 'Growing Nature Reserves on top of your Trash' www.tiramor.cymru/habitatloss (Resource 1)

Discuss:

- What are the benefits of regenerating landfill sites?
- How does regeneration help return habitats to wildlife?
- Why is it even better to avoid creating landfill sites in the first place?

5. Provide each group with a 'Lost and Found Creatures' sheet (L\_HL\_1). Discuss the habitats these creatures rely on and how they may lose their habitat due to landfill expansion. Encourage learners to identify the specific habitat for each creature and consider how landfill growth directly threatens these environments.

6. Ask groups to design a 'regenerated landfill' on the large sheet of cardboard/ paper, incorporating elements like:

- Native plants and trees
- Ponds or water features
- Shelters for different animals
- Recycling bins to emphasize waste management

7. Encourage learners to decorate their regenerated landfills using recycled materials and various arts materials. They may include the creatures from the 'Lost and Found Creatures' sheet (L\_HL\_1) in their new habitat (e.g. insects in meadows, dragonflies in wetlands or birds in tree shelters).

8. Invite each group to present their ideas. Ask:

- Which animals can be found in your regenerated landfill site?
- How does your design help protect habitats and wildlife?
- Could further improvements be made? Why do you think that?
- How might the circular economy keep your regenerated landfill thriving and prevent other natural spaces from turning into landfill?

Share the Wild Landfill documentary 'Today's Landfills are becoming tomorrow's New Ecosystems' - <u>www.tiramor.cymru/habitatloss</u> (Resource 2).



### Shrew

ings on Unsplash





### Blackbird

Photo by Jim on Unsplash

Mouse



Photo by Zdenek Machacek on Unsplash

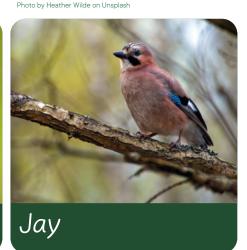


Photo by Damian Kwiatkowski on Unsplash



### Hedgehog



Photo by David Clode on Unsplash





Yost on Unsplash



Bees

Photo by Massimiliano Latella on Unsplash



### Newt

noto by Asha Taylor on Unsplash



### Beetle

Photo by Brandon Stoll on Unsplash

Hibernation

### Hibernation

Hibernation is used by some animals to help them survive through periods of environmental stress - like winter's extreme cold and lack of food. Hibernation is different from sleeping due to the difference in the way the organism's body operates.

A hibernating animal's body temperature falls to nearly the same temperature as their surroundings, their heart rate and breathing rate decrease, and their metabolism slows right down. This allows them to use minimal energy to get through periods of time in which they would otherwise use huge amounts of energy to keep warm. Before entering hibernation the animal must prepare by adding as much fat as possible by eating huge amounts. Because hibernation takes place in winter the animals can take advantage of the late summer gluts of food.

Although hibernation has evolved to increase the chances of an animal making it through winter it can still be dangerous because the slowing down of all the body's systems means that the animals cannot respond quickly and so they become vulnerable to predators. They can also starve from lack of fat reserves, severe weather or being woken up too soon before food has become available again.

In the UK mammals like hedgehogs, dormice and bats hibernate as well as amphibians and reptiles like the common frog and the adder. You might be surprised to find out that some insect species like peacock and small tortoiseshell butterflies, ladybirds, Queen wasps and bumblebees also hibernate over winter.

Animals need to find somewhere safe and sheltered to spend the winter where they won't be disturbed and where the temperature remains stable. You can help by building winter homes for wildlife in your garden or school grounds.

Hedgehogs are particularly vulnerable to climate change because of warm weather disrupting their hibernation patterns. Ticks can persist on hedgehogs in warmer weather and there are many other parasites and infections, particularly ringworm, which affect hedgehogs. Their numbers are decreasing alarmingly: numbers have fallen by up to 30% in urban areas and 50% in rural areas since 2000. No single cause is responsible, making recovery plans difficult. There are ways in which we can help by providing food, creating shelter and making gardens a haven for the hedgehogs by interconnecting corridors and holes in fences.

#### Further research keywords

Aestivation, torpor, denning, hibernaculum, dormancy, hyperphagic, metabolism, endotherm, ectotherm, phenology - nature's calendar, nocturnal, crepuscular, emergency rescue box.

### **Build a Bug Hotel**

#### **Equipment required**

- Print out of the 'Bug Hotel' worksheet, one per group
- Wooden pallets or planks of wood
- Bricks
- Old plastic bottles
- Bamboo canes
- Straw / leaves / twigs / bark / stones and pebbles
- Tiles
- Cardboard

#### To build the hotel

The best time to build a bug hotel is in the autumn because the materials are more freely available but you can build them at any time.

1. Divide the learners into groups. If you have enough equipment then each group could make their own hotel. If not you could divide up the jobs instead, for example one group fills the plastic bottles, one group stacks the pallets, one group pots up plants for the top, make the sign etc.

Hours

2. Stack the pallets or planks of wood using the bricks in between each layer so that you create lots of small rectangular sections.

3. Fill the sections with different combinations of items to create different sizes and types of gap and crevice.

4. Fill gaps with leaves and straw.

5. Add plants or turf to the top of the pallet stack.

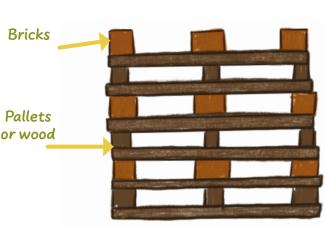
6. The completed structure can be decorated; maybe include a hotel name sign or insect pictures painted on wood and stones.

# Bug Hotel

Help insects get through the winter by building a bug hotel. Make sure it's got lots of different materials, gaps and crevices so that lots of different kinds of insects can live there.

### **STEP1**

In groups, stack up your pallets or bigger pieces of wood in between bricks so that you end up with little sections.

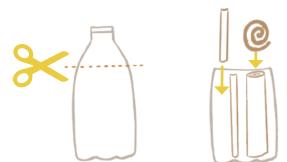


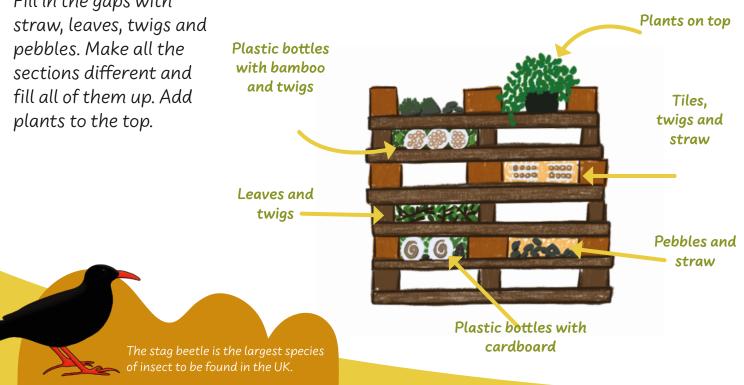
### STEP 2

Fill your plastic bottles with the bamboo canes or rolled up cardboard. Make piles of tiles and twigs.

### **STEP3**

Fill in the gaps with





## **Hibernation Match**

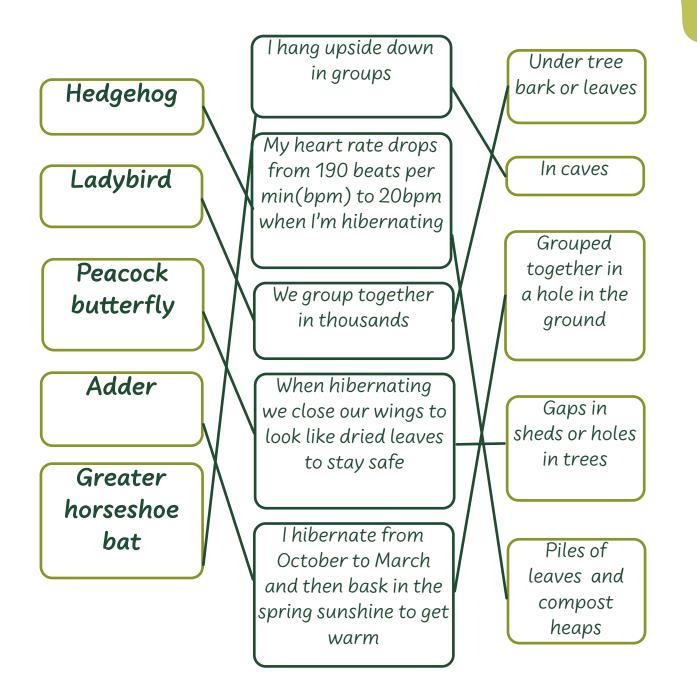
### **Equipment required**

Print the 'Hibernation Match' worksheet for all learners

#### To complete the activity

1. Support learners to complete the worksheet.

### **Answers - Habitat Match**

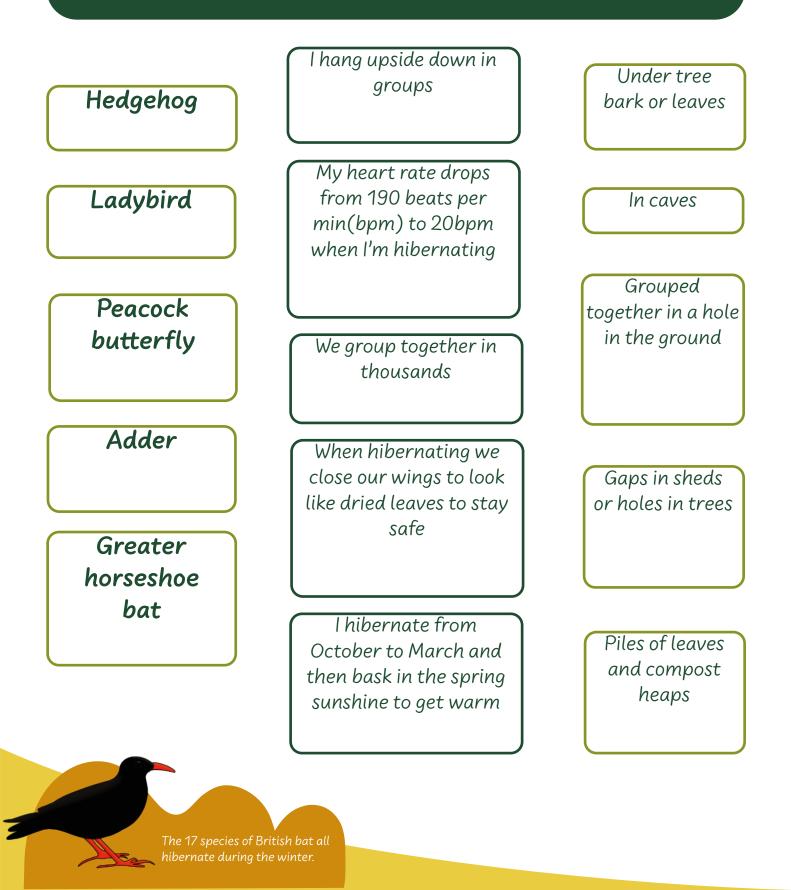


PS: 3

# Hibernation

#### Game rules

- Match the animal name to the fact about their hibernation and then to where they hibernate.
- Colour in the matching boxes in the same colour.



## **Hibernation Challenge**

20-30

#### **Equipment** required

- Twigs (representing earthworms or slugs)
- Stones (representing snails)
- Leaves (representing bedding)
- Cones or markers to define each zone
- Large outdoor space for safe movement

#### Set up

- 1. Create a Start Line for all players to begin.
- 2. Set up four zones:
  - Zone 1: Food Collection (Twigs = earthworms/slugs).
  - Zone 2: Bedding Collection (Leaves = bedding).
  - Zone 3: Warm Weather Challenge (Simulate energy loss with jumping jacks/ hops based on the temperature).
  - Zone 4: More Food Collection (Stones = snails).
- 3. Mark an end zone for players to reach safety/hibernation.

4. Assign 1–2 learners to act as predators (e.g., foxes or badgers) and tag players between zones.

- 5. Decide on a challenge for the 'Warm weather' zone,
- e.g. It's  $10^{\circ}C = 10$  jumping jacks / It's  $20^{\circ}C = 20$  hops / It's  $30^{\circ}C = 30$  star jumps.

#### How to Play

1. Players start at the Start Line and move through the zones, collecting 2 food items (twigs or stones) and 1 bedding item (leaves).

2. Players must avoid predators between zones. If tagged, players return to the Start Line, discard items outside the play area, and restart.

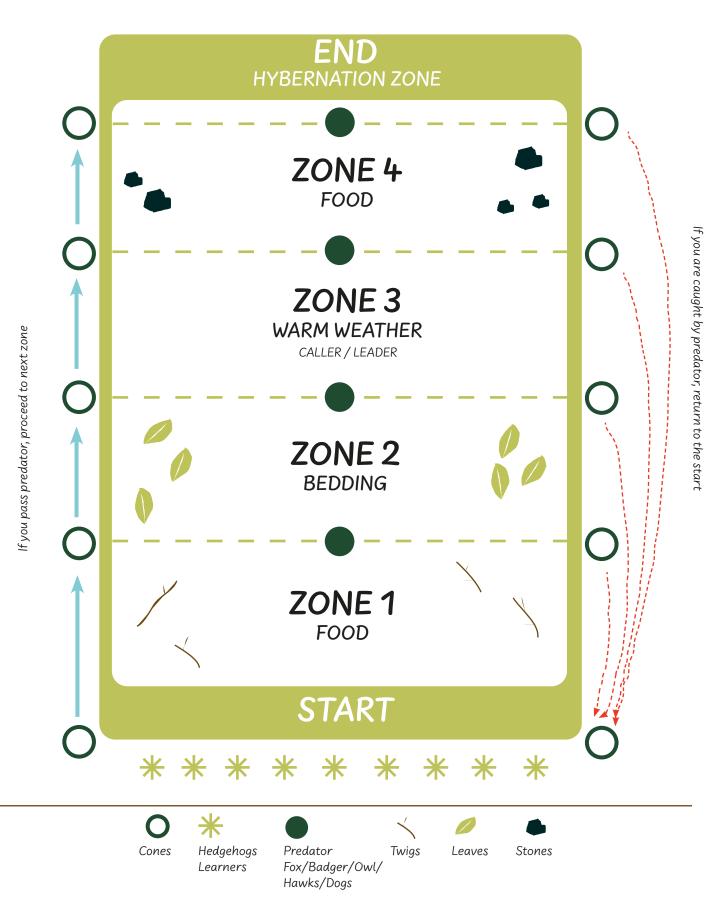
- 3. Follow zone-specific instructions:
  - Zone 1: Collect 1 twig.
  - Zone 2: Collect 1 leaf.
  - Zone 3: Perform the warm weather challenge based on the temperature.
  - Zone 4: Collect 1 stone.

4. The game ends when the players reach the End Zone with all items collected, OR no items are left to collect, symbolising resource scarcity.

- 5. After playing the game, take some time with the learners to reflect:
  - What do hedgehogs need for food and bedding to prepare for hibernation?
  - How does warm weather cause energy loss and create survival challenges for hedgehogs?
  - What threats do predators pose to hedgehogs?
  - How do limited resources affect the survival of wildlife?
  - How could this activity be adapted for younger learners? (e.g. reducing the number of zones or making predators stationary).

PS: 2/3

# Hibernation Challenge



### Why Hedgehogs Need Help

### Useful link

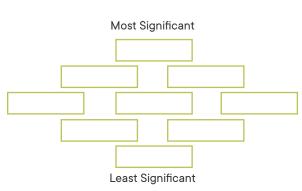
Visit The Big Hedgehog Map website to discover how many hedgehogs have been seen in your area <u>www.tiramor.cymru/ hibernation</u> (Resource 1)

### **Equipment required**

- Print out the 'Hedgehog Threats' and 'Possible Solutions' worksheets, one per pair
- Scissors
- Pencils or pens
- Internet enabled devices and internet access for research

#### To complete the activity

1. Give each pair of learners a set of statement cards to rank. Ask them to cut and rank these statements in a diamond formation. Learners may wish to use the internet to research and gather more information about each threat to make informed decisions. The most significant threats should be placed at the top, and the least significant at the bottom.



2. Encourage learners to discuss their choices and explain why they ranked them as they did. e.g. "Why do you think this threat is more significant?"

3. Invite learners to share their ideas with the rest of the class. Systemic issues (like habitat loss and road traffic) have the most profound and widespread impact, while more localised or preventable dangers (like litter or bonfires) are less critical overall.

4. The activity can be extended by encouraging learners to consider and research possible solutions to protect hedgehogs and their habitats. Ask learners to come up with creative ideas to address a significant threat (e.g., creating hedgehog highways through fences and hedges; building hedgehog homes, like nesting boxes or log piles; or, implementing slower speed limits in areas with known hedgehog populations).

5. Challenge learners to write a hedgehog-friendly post for the school social media, educating others about how to protect hedgehogs.

#### Social media post guidelines

1. Select the social media platform to be used.

- 2. Create an engaging message, keeping the content concise (maximum 150 words).
- 3. Include a clear call to action, e.g., creating hedgehog-friendly gardens.
- 4. Choose strong visuals, ensuring necessary permissions to use any images.
- 5. Use relevant hashtags to increase visibility (e.g., #hedgehog, #wildlife, #conservation).
- 6. Consider providing hyperlinks to reliable additional information in your post.

# Hedgehog Threats

#### Game rules

Cut out the statements and arrange in a diamond shape, placing the most significant threats to hedgehogs at the top and the least significant at the bottom.

### Discuss your choices with your partner and be ready to explain and justify your rankings to the rest of the class.



Hedgehogs can run up to 6 miles per hour!

### **Possible Solutions**

Research possible solutions, like creating hedgehog-friendly gardens, building nesting boxes, or slowing traffic in areas where hedgehogs live. Think about how these ideas can help protect hedgehogs and reduce the threats they face.

Once you have your information, write a hedgehog-friendly post for the school's social media page!

Max 150 words

In your post, explain why hedgehogs need help and share how people can protect them. Be creative and include simple tips that others can follow to make a real difference!



Choughs

### Introduction

### Choughs

The Chough, pronounced 'chuff' like rough, is a glossy black bird with bright red bill and feet. Once common across the UK, it is now found only in small patches of coast in Wales, Cornwall and some of the Scottish islands. Its name is founded in the 'cheeow' sound that the bird makes.

The Chough is part of the same family as crows and jackdaws and shares their high intelligence. They are renowned for their aerial acrobatics, soaring high above coastal cliffs, swooping and wheeling around each other. People often say that Choughs look as if they are playing and really enjoying flying.

A good place to see choughs is the coast of the Llŷn peninsula. Choughs need a specific habitat in order to thrive. They feed on tiny invertebrates like ants and so need vegetation that is kept short enough for them to forage but long and varied enough for invertebrates to thrive. The grass is kept at its perfect height either by grazing animals or by the harsh wind and salt in coastal cliff areas. The species is vulnerable to changes in farming practices that make the habitat unsuitable for feeding.

Choughs have long been a fascination for people. Hundreds of years ago they, along with other members of the crow family, were kept as pets. One of the most famous legends to feature these fascinating birds is that of King Arthur, and it is said that he did not die in battle but instead his soul migrated into the body of a chough.

#### **Coastal heathland**

There are a few different types of heathland in the UK. Choughs make their home in coastal heathland. These open landscapes comprise mainly of small, hardy shrubs such as heather and gorse, patch-worked with grazed farmland. The strong winds and very salty air of the coast mean that vegetation cannot grow particularly tall and trees can not take hold. They are home to a specialised set of plants and invertebrates that in turn feed larger birds and animals. Open lowland heathland is a rarer habitat than rainforest and west Gwynedd is one of the areas of the UK that still has a significant amount.

#### Further research keywords

*Pyrrhocorax pyrrhocorax*, Cornish chough, heathland, corvid, Llŷn Peninsula, British Trust for Ornithology, grazing, bird ringing, conservation, red-billed chough.

30 mins

# ΤE

### **Heathland Hunt**

#### **Equipment required**

- Printed species sheets (L\_C\_ 1)
- Reward tokens
- Sheet of facts

### To play the game

This game can be played outside with learners running to stand behind the correct answer or in a classroom with children voting for the correct answers with slips of paper with their names on or putting their hands up.

The instructions below are for the outdoor version.

1. Lay out the photos of the six species on the floor with enough space around them for the learners to gather.

2. Read out the facts one by one. Ask learners to run to whichever species they think the fact is referring to.

- 3. The learners behind the correct species are given a token.
- 4. Keep repeating until someone reaches six tokens.
- 5. Discuss the facts and species as a class.

Facts

30 mins

FEACHER'S PAC

Topic: Choughs

PS: 2/3

### **Heathland Hunt**

- We can reach speeds of 45mph: Hare
- We give birth to between 6 and 20 live young: Adder
- We have a wingspan of 20cm: Stonechat
- We nest in sea caves, old mine workings, abandoned buildings: Chough
- We need to use the sun to warm up: Adder
- It has sharp spikes to deter grazing animals: Gorse
- We pair for life: Chough
- We can frequently be seen sitting on the top of gorse bushes: Stonechat
- We are thought to have been introduced into the UK in Roman Times: Hare
- Can be used as a yellow dye: Gorse
- Is also called 'ling': Heather
- We love to eat ants: Chough
- It used to be used to make brooms: Heather
- It smells of coconut: Gorse
- We have a sharp loud call that sounds like two stones being hit together: Stonechat
- It can live for over 40 years: Heather
- We don't dig burrows but shelter in 'forms', which are shallow depressions in the ground or grass:
  Hare
- We have red eyes: Adder



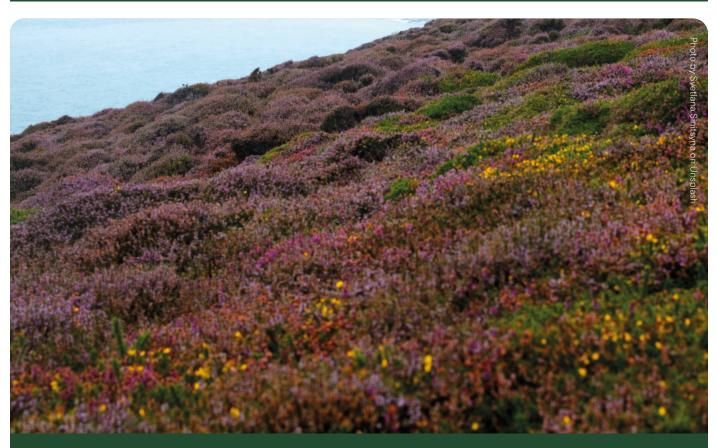
### Hare







### Stonechat



### Heather





### Gorse



Adder



### 

### Legends

### **Equipment required**

- Copy of the 'Legends' worksheet, one per learner
- Pencils or pens

#### To complete the activity

1. Discuss the idea of legends and how they were used to explain a lot of the natural world before science.

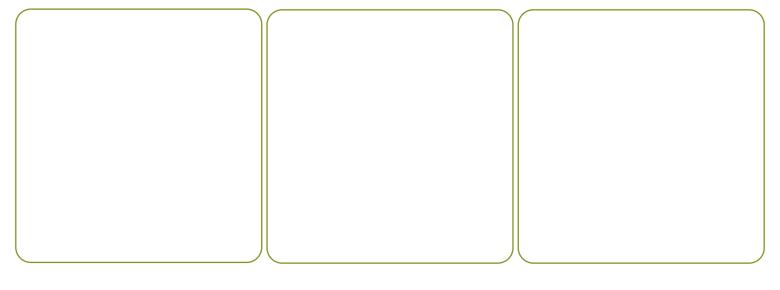
2. Support learners to use their worksheet to map out the main points of their legend on the story board and draw pictures to accompany them.

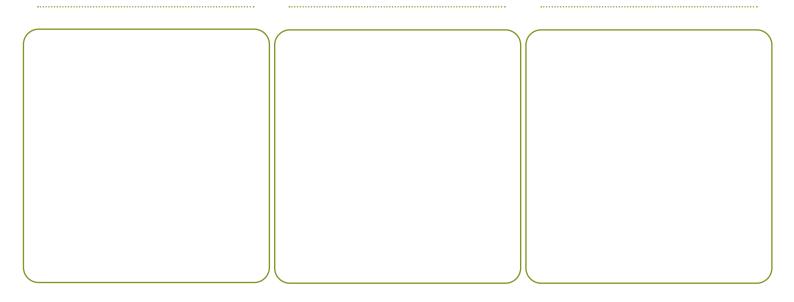
PS: 2/3

# Legends

Choughs are part of many legends. Their playful acrobatics and cleverness have inspired many stories.

Write your own legend about chough, and fill in the boxes below with drawings and words that tell your story. Remember to plan ahead because you only have six boxes to tell your whole story.







For more information and extra resources please visit: www.tiramor.cymru or email: info@penllynarsarnau.co.uk

10 3 4 2 2 1

EN TRAC

0.1

f 🛛 🔿 🚿

01177