



national
museum
amgueddfa
Cardiff
caerdydd



natural history galleries learning resource

RELEVANT TO
THE NATIONAL
NUMERACY
AND LITERACY
FRAMEWORK

national
museum
amgueddfa
Wales
cymru



contents

Introduction

Booking a visit	Page 3
Planning a visit	Page 4
Practical information about the galleries	Pages 5 - 6
Curriculum links and Skills Summary	Pages 7 - 11
Map of the Natural History Galleries	Page 12

Lower Natural History Galleries

Pages 13 - 20

The seashore in Wales
The basking shark
The woodland in Wales
Back at school

Upper Natural History Galleries

Pages 21 - 29

Life in the sea
The humpback whale
The leatherback turtle
Back at school

Evolution of Wales Gallery

Pages 30 - 45

A journey through time
Stars, meteorites and Moon rock
Volcanoes and coral reefs
The coal forest
Dinosaurs
The Ice Age
Back at school

The Natural World Gallery

Pages 46 - 49

Diversity of life
Minerals

Answers to popular questions

Pages 50 - 51

KWL chart

Page 52

Worksheets

Pages 53 - 72

Copyright Ownership

We have tried to identify copyright ownership in all cases; any further information would be gratefully received by the Learning Department, National Museum Cardiff, CF10 3NP

natural history learning resource

This teacher-led resource for primary schools has been written to help teachers and other group leaders **plan a successful visit**.

These galleries are diverse, covering many different topics within the **science curriculum**, including habitats, animals, plants, dinosaurs, minerals and biodiversity.

The content is also relevant to the **National Numeracy and Literacy Framework**. You will find a spreadsheet showing you where the activities fit with the current framework to enable you to plan your visit into your schemes of work.

This pack provides you with further information about the displays to help answer any questions your group may have. It also contains activities to help explore the displays.



Booking a visit

Learning Office – for bookings and general enquiries

Tel: 029 2057 3240

Email: learning@museumwales.ac.uk

All groups must book in advance, whether visiting independently or on a museum-led visit.

The information in this pack enables you to run your own teacher-led session.

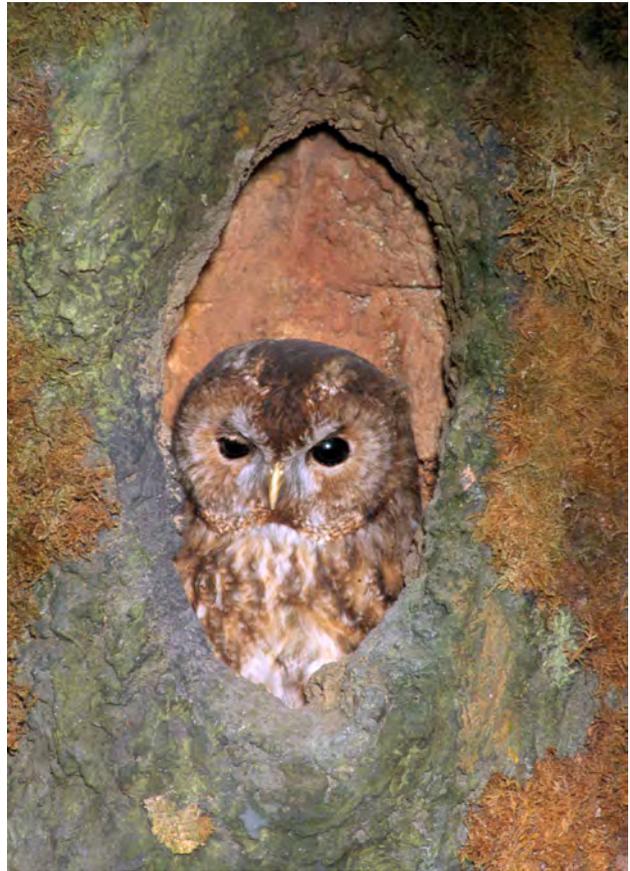
Gallery talks and workshops are available for all primary school learners. You may wish to book a museum-led session to complement your visit. See our website for more details.



Planning a visit

How to plan a successful visit to the Natural History Galleries

- Visit the galleries on your own before the visit.
- Decide whether you are planning a general visit to explore the galleries or want to focus on a specific gallery or topic.
- Divide your pupils into smaller groups.
- Provide opportunities for pupils to work on focused activities in front of specific displays.
- Ensure a good range of activities that involve looking, talking and doing.
- Read the 'Back at School' activities for ways to develop the visit back in the classroom and develop higher order reading.
- We offer a range of museum-led learning workshops to help support your visit.



You can speak to a Museum Learning Officer to discuss and plan your visit.





Suggestions on using the pack

It isn't possible to cover the entire content of this pack in one visit, but hopefully it will help you to feel more prepared.

Please feel free to copy, adapt and change to suit your needs.

You may want to use the KWL grid as a starting point for your exploration of the displays.

N.B. Some of the activities will require specific equipment that you will need to bring with you to the Museum, e.g. tape measures, post-its, maths paper, whiteboards.

Practical information about the galleries

Access

- The Natural History Galleries are located on the ground floor. There is lift access to the upper Natural History Gallery.
- The galleries are wheelchair accessible but the route is narrow in places.
- The lighting can be low in certain areas.

Sound

- There are sound effects throughout the galleries.
- The dinosaurs are loud and can be heard throughout the Evolution of Wales Gallery.
- We can make special arrangements if you wish to see something in particular without sound. This may not be possible all the time.

Time-out zone

- We have a room available should you require a quiet space. Please book in advance.

Activity sheets

- You can print them from our website www.museumwales.ac.uk/learning

Touching objects

The specimens on display in the galleries cannot be touched. Touching causes some surfaces to wear away. However, there are special touchable objects including touch panels containing fur samples and seashore creatures.

Clore Discovery Centre

This is a special gallery containing lots of museum objects that can be touched. There are over 50 handling drawers within this gallery containing a range of objects from seashore shells and animal bones, to teapots and minerals. There is also a member of staff to help you with any questions or special requests.

A visit to this gallery is recommended. **Pre-booking is essential.**



Curriculum links

Skills framework

The ideas within this pack will help develop enquiry, communication, and thinking skills. Please see the separate **Skills Summary** section for reference to the **National Numeracy and Literacy Framework**.

The Curriculum Cymraeg

The galleries provide lots of opportunities to explore the landscape and history of Wales.

Early Years

The galleries can be used to support a number of areas of the early years curriculum, in particular:

Personal and social development, well-being and cultural diversity – Foster curiosity and develop positive attitudes to new experiences and learning.

Language, literacy and communication – Listen to and carry out instructions, extend vocabulary and write independently and collaboratively.

Welsh language development – View and listen to a variety of visual and audio stimuli in the galleries.

Knowledge and understanding of the world – Explore, observe and investigate different environments. Recognise how people's actions can improve or damage the environment.

A visit also provides an opportunity to sequence events e.g. 'a journey to the Museum'.

Ages 7-11

Science – The Natural History Galleries can help to develop skills and range in science.

Interdependence of Organisms – Explore environments and local plants and animals. Understand the interdependence of organisms in habitats. Consider how humans affect the local environment.

The Sustainable Earth – Revise the solar system. Explore natural and man-made materials.

Geography – Explore our changing environment, from the past to the present. Pupils can follow directions and maps, and identify and describe natural features.

ESDGC – The galleries can provide stimuli for exploring the local and global implications of our actions on the natural environment and the choices and decisions we make in response.

Art & Design – Use the galleries to select and record from observations and experiences, and investigate the natural environment.

Skills Summary – Natural History Galleries

The table below identifies the key Literacy and Numeracy skill for each of the activity pages contained within the pack.

Topic	Numeracy		Literacy	
	Strands	Elements	Elements	Aspects
The Seashore	Using measuring skills	<ul style="list-style-type: none"> • Time • Length 	Oracy Developing and presenting information and ideas	<ul style="list-style-type: none"> • Listening
	Using number facts and relationships	<ul style="list-style-type: none"> • Compare and order numbers 	Oracy Developing and presenting information and ideas	<ul style="list-style-type: none"> • Speaking
	Develop numerical reasoning	<ul style="list-style-type: none"> • Identify processes and connections 		
The Basking Shark <i>(Will require metric tape measure)</i>	Using number skills	<ul style="list-style-type: none"> • Estimate and check 	Oracy Developing and presenting information and ideas	<ul style="list-style-type: none"> • Listening
	Using measuring skills	<ul style="list-style-type: none"> • Length 	Oracy Developing and presenting information and ideas	<ul style="list-style-type: none"> • Speaking
The Woodland	Using number skills	<ul style="list-style-type: none"> • Using number facts and relationships 	Oracy Developing and presenting information and ideas	<ul style="list-style-type: none"> • Speaking
			Writing Write accurately	<ul style="list-style-type: none"> • Language

Topic	Numeracy		Literacy	
	Strands	Elements	Elements	Aspects
Life in the Sea <i>(You may like to bring some graph or squared paper for presenting data skills)</i>	Using measuring skills	<ul style="list-style-type: none"> Length 	Writing Organising ideas and information	<ul style="list-style-type: none"> Meaning, purposes, readers
	Using number facts and relationships	<ul style="list-style-type: none"> Compare and order numbers 	Oracy Developing and presenting information and ideas	<ul style="list-style-type: none"> Speaking
	Using data skills	<ul style="list-style-type: none"> Present and analyse data 	Oracy Developing and presenting information and ideas	<ul style="list-style-type: none"> Listening
The Humpback Whale <i>(Some numeracy preparation in advance necessary)</i>	Using number skills	<ul style="list-style-type: none"> Using number facts and relationships 	Writing Organising ideas and information	<ul style="list-style-type: none"> Structure and organisation
	Develop numerical reasoning	<ul style="list-style-type: none"> Represent and communicate 	Oracy Developing and presenting information and ideas	<ul style="list-style-type: none"> Collaboration and discussion
	Using number skills	<ul style="list-style-type: none"> Fractions, decimals, percentages and ratios 		
The Leatherback Turtle	Using number skills	<ul style="list-style-type: none"> Using number facts and relationships 	Writing Write accurately	<ul style="list-style-type: none"> Language
	Using number skills	<ul style="list-style-type: none"> Calculate using mental and written methods 	Oracy Developing and presenting information and ideas	<ul style="list-style-type: none"> Collaboration and discussion
	Using data skills	<ul style="list-style-type: none"> Present and analyse data 	Oracy Developing and presenting information and ideas	<ul style="list-style-type: none"> Listening

Skills Summary – Evolution of Wales Gallery

Topic	Numeracy		Literacy	
	Strands	Elements	Elements	Aspects
Meteorites and Moon Rock	Developing numerical reasoning	<ul style="list-style-type: none"> Identify processes and connections 	Oracy Developing and presenting information and ideas	<ul style="list-style-type: none"> Collaboration and discussion
			Reading Responding to what has been read	<ul style="list-style-type: none"> Response and analysis
Volcanoes and Coral Reefs	Using number skills	<ul style="list-style-type: none"> Using number facts and relationships Estimate and check 	Writing Organising ideas and information	<ul style="list-style-type: none"> Structure and organisation
	Using data skills	<ul style="list-style-type: none"> Collect and record data Present and analyse data 	Oracy Developing and presenting information and ideas	<ul style="list-style-type: none"> Speaking
The Coal Forest	Using measuring skills	<ul style="list-style-type: none"> Weight 	Oracy Developing and presenting information and ideas	<ul style="list-style-type: none"> Listening Speaking
	Using number skills	<ul style="list-style-type: none"> Ratio 	Writing Organising ideas and information	<ul style="list-style-type: none"> Meaning, purposes, readers Structure and organisation
	Developing numerical reasoning	<ul style="list-style-type: none"> Represent and communicate 	Oracy Developing and presenting information and ideas	<ul style="list-style-type: none"> Collaboration and discussion

Topic	Numeracy		Literacy	
	Strands	Elements	Elements	Aspects
Dinosaurs	Develop numerical reasoning	<ul style="list-style-type: none"> Identify processes and connections 	Writing Organising ideas and information	<ul style="list-style-type: none"> Language
	Using measuring skills	<ul style="list-style-type: none"> Length 	Oracy Developing and presenting information and ideas	<ul style="list-style-type: none"> Speaking Listening
	Using number skills	<ul style="list-style-type: none"> Calculate using mental and written methods 		
The Ice Age	Using measuring skills	<ul style="list-style-type: none"> Temperature 	Writing Organising ideas and information	<ul style="list-style-type: none"> Structure and organisation
			Writing Writing accurately	<ul style="list-style-type: none"> Language Grammar, Punctuation, Spelling

Map of the Natural History Galleries



lower natural history galleries

the seashore

Explore together

- Sit down and explore the seashore together.
- Can you think of words to describe what you see?
- Describe the different parts of the seashore.
- Do you recognise any of the animals? What do you think they are doing?

Typical seashore animals can be found on the **cliff**, **rocks**, **sand** and in the **rock pools**. Displays around the edges of the gallery show sand dune formation and seashore plants.

Find the **puffin** sitting on top of the cliff. Puffins can sometimes hold their breath for 7 minutes whilst diving for fish. Other animals have different adaptations for life beside the sea. Notice how the birds above you have white bellies and darker backs. Consider how this camouflage might help them feed and avoid being eaten.



The red blobs you can see dotted over the rocks are models that show what **anemones** look like when out of the water. Find them in the rock pool on the other side of the rocks, with their sticky tentacles out ready to trap small fish and crustaceans.



Activity ideas

Animal Homes

Ask your group to choose an animal that lives on the seashore.

Once they have found their animal ask them to think about the appearance of their animal, where it lives, and what it eats. Discuss their answers. Do all the animals live in the same place? Do they eat the same things? Why not? Ask them to draw their animal in its home.

Animal Feeding

As a group look closely at the different birds on the seashore and describe their beak shapes. Do you think they all eat the same thing? What do they eat? (Curlew – curly beak – worms / Cormorant – hooked beak – fish / Oystercatcher – strong beak – shellfish)

Make a sketch of one of the birds, and draw what it eats.
Can you create a food chain for your bird?

Numeracy – Measuring time

(You will require a watch or stopwatch for this task)

The puffin can hold its breath underwater for as much as 7 minutes.
Can you estimate how long half a minute is? Raise your hand when you think half a minute has passed. Which member of the group estimated the most accurately? How many half minutes are there in 7 minutes?

Literacy – Listening game

(The children will need to listen attentively to what each member of the group says)

"I went to the seashore and saw a -----"

"I went to the seashore and saw a ----- and a -----." *(play cumulatively)*

Or adapt as a memory recall game: "Can you remember what Sally/Sam saw?"

Literacy – Effective language

An adult describes one of the birds on display in the gallery. The children to listen to the description and deduce which one.

Think of adjectives that suit the different animals you can see in the gallery.

Enhance sentences using similes – e.g. The curlew's beak is as curly as a -----

Activity ideas

Comparative Vocabulary – Length

What is the longest / shortest animal you can see?

I spy game – Find something longer / shorter than -----

Devise compound comparative sentences – “The puffin is longer than the ----- but shorter than the ----- ”

Order according to size – give each child in the group the name of a different bird. Ask the group to arrange themselves in order according to the size of the bird they represent. Review – How easy / difficult was this task? Why is that? What information would you need to make the task easier?



the basking shark

Explore together

- Sit down and explore the basking shark.
- What kind of animal do you think this is? A shark
- How do we know it's a shark? What features can we see?
 - A dorsal fin (on its back)
 - An upright tail, they move their body from side to side – ask your pupils to move their arms side to side
 - Gills
 - A big mouth!
 - Does it have any teeth? What can't it do? Chew or eat you!

The **basking shark**, *Cetorhinus maximus*, is the second largest shark in the world (the largest is the whale shark, *Rhincodon typus*), and the biggest off the coast of Wales.

Basking sharks can grow up to 10 metres long.

Despite their large mouth, basking sharks eat tiny, microscopic **plankton** at the water surface. They use their huge mouth like a giant net. Watch the video up on the balcony to see how.

Basking sharks are **cartilaginous fish** – their skeleton is made from cartilage, not bone. Cartilage is tough and flexible. You can feel it in your nose and ears – give them a wiggle!



Activity ideas

Numeracy – Measuring

(You will require some tape measures for this task)

Estimate how long the shark is – discuss as a group the figures and the units used. Reach a group consensus. Ask the children how we might measure it.

Using non-standard measures

Have a go at a range of ideas for measuring – using paces, hands, using objects, lying down end to end (be careful doing this – please ensure there is an adult beside the big doors at all times to warn any visitors).

Discuss why this is not a good way to measure accurately.



Measuring accurately

Use a tape measure to measure the shark accurately. Is it possible to get an accurate measurement?

How could we get the best accurate measurement?

Literacy – True or false

Use whiteboards or prepare sentences back at school giving true or false statements about the basking shark. Encourage your pupils to make up their own true and false statements in the gallery, and challenge the rest of the class to answer.

For younger children – an adult makes a statement and the children decide whether the statement is true or false. For example “I am a basking shark because -----”

Extend language understanding by including negative statements: “I am not a basking shark because -----”

Older children can read the information in the gallery independently and take it in turns to devise a true or false statement for each other.

the woodland

Explore together

- Sit down and explore the woodland together.
- Describe the different halves of the woodland. Why are they different?
- How might the seasons affect the woodland?
- Do you recognise any of the animals? What do you think they are doing?

An oak tree is home to many birds, small mammals, insects, mosses, lichens and fungi. Owls roost in trunks, birds build nests in branches, and the bark is home to small insects, which in turn attracts woodpeckers.

Acorns fall to the ground in autumn providing food for squirrels, mice and wood pigeons. These animals are then eaten by birds of prey, like buzzards, red kites and owls. Rotting leaves and wood provides food for hundreds of different fungi, woodlice and insects.

The oak's open canopy allows plenty of light to reach the ground, so that many other plants, including primroses, violets, bluebells and ferns, can grow here. In contrast, the pine forest looks very dark and flowerless due to the dense shade and uniform quality of conifer plantations.

Around the edges of the gallery are displays focussing on garden birds, pine forests, leaves, fungi, and invertebrates.



Activity ideas

Seasons

Explore both sides of the oak tree closely. What seasons do they represent?
How do the seasons affect the woodland animals?
How do the seasons affect you?

Discuss how the different animals in the display keep warm in winter. What happens to some animals during the winter?

What happens in autumn?

A Home

Discuss why a home is important is to us.
Find the owl's nest, the badger's sett and the buzzard's nest (look up in the branches).
Ask each child to choose an animal. Ask them to think about these questions:
Where is their animal's home? Why is the home important to their animal?
Discuss the answers as a group.

Food Chains

Choose one or two animals and say what they eat.

Look at the teeth on the touch panel beside the woodland. Can you work out what they might eat just by examining their teeth? Use appropriate words – herbivore and carnivore

Either as a class or in small groups, create a simple food chain using one or two of the animals and plants in the display. What factors could affect the food chain?

Literacy

Birds-eye view. Go up to the balcony to see the woodland from a bird's point of view.
Describe what it would be like to be a bird of prey, hunting for its food high in the tree. Write a short diary.

Comparing and Contrasting Habitats

Explore both the seashore and the woodland. Find three main differences and similarities between the habitats.

Are the animals different? Why is that? Consider where they make a home, what food they eat, whether they need freshwater etc.

Choose two birds from the displays. For example, a bird of prey from the woodland and a seashore bird.

Draw them and then note down their similarities and differences.

As an extension activity, pupils could suggest the reasons why.

Back at school ideas

Seashore

- Research one of the seashore animals and create a fact sheet describing its lifestyle.
- Use your words describing the seashore to create poetry.
- Create a seashore food chain. Can you extend it into a food web? What happens to the food chain/web when an environmental disaster occurs?
- Undertake your own seashore field trip. The Field Studies Council have some fantastic ID charts for identifying seashore animals. Collect broken shells on the beach and arrange to make large shell pictures in the sand.
- Take part in a beach clean at your local beach. See www.mcsuk.org/beachwatch/ for more details.
- Explore paintings inspired by the seashore. Create your own.
- Buy or make your own magic sand (hydrophobic sand). Explore the properties of hydrophobic sand. Compare it to normal sand.



Woodland

- Create your own bird feeders for the school grounds, log pile homes for minibeasts, or bee hotels.
- Set up your own nature table in your classroom – how does this change with the seasons?
- Go on an 'urban safari', for schools in built-up areas. Challenge your pupils to find nature on their doorstep. Why not record your findings in a display – take photos, make pictures, count how many birds/insects you see.
- In the autumn collect fallen leaves and make your own leaf pictures, or leaf crowns by gluing leaves to rings of card.
- Make sculptures using stones or sticks.
- To find out more about woodlands and for lots of ideas and resources visit the Woodland Trust's website www.naturedetectives.org.uk/
- Visit the Museum's nature website www.museumwales.ac.uk/woodlands



upper natural history galleries

life in the sea

Explore together

- Wander around the gallery and explore the different creatures found in the sea.
- Marine organisms come in many different shapes and forms.
- Describe a few together. How do their features help them survive?
- Think about colour, shape, how they feed and how they protect themselves.

This gallery features a breathtaking array of marine wildlife from sea urchins and stone crabs to dolphins and swordfish. These exhibits represent the marine collection that we hold in the Museum and also illustrate the huge diversity of organisms living in our seas and oceans.



Adapting to life underwater

Marine organisms come in many different shapes and forms. They have developed incredible adaptations that help them to survive better in their environment.

Many have specially adapted structures to help with feeding, moving or staying put. Getting oxygen involves other useful adaptations, e.g. gills. And finally, protection requires structural, chemical and even behavioural adaptations; for example spines, poisons and burrowing into rocks.



Activity ideas

Adaptations

Find the sea slugs. How many different colours can you see?

Why do you think they are so brightly coloured?

- For camouflage?
- Being scary?
- Being attractive?

Look for other colourful organisms in the gallery. What do you think their colour does for them?

Sorting and Classifying

As a group look closely at the labels beside each organism. They are different colours depending on the group the organism belongs to. Each group shares similar features.

Split the class into 4-6 groups. Task each group with finding all the organisms in a particular group, e.g. Mollusca, Crustacea, Echinodermata, Annelida, Chordata, Arthropoda. Use the labels to find the group name.

Next, ask each group to note down the features that the organisms in their group share.

As an extension activity, the groups could swap their notes and challenge the other groups to work out which group they were looking for.

Recording Data

Draw a table in which you can record the common features you have gathered during the classification activity.

Work collaboratively in order to share the information you have gathered with the other groups.

Literacy – What rhymes with...?

Think of words that rhyme with some of the exhibits.

Try writing a short rhyming couplet; they need not make sense – in fact the funnier the better.

(You can even try to rap your efforts.)

Here are some examples:

Look at the crab – watch out he will grab!

I ate the shell and didn't feel well.

Review each other's rhymes. Which one did you find the funniest?

Comparative Vocabulary – length

What is the longest / shortest animal you can see?

I spy game – Find something longer / shorter than...

the humpback whale

Explore together

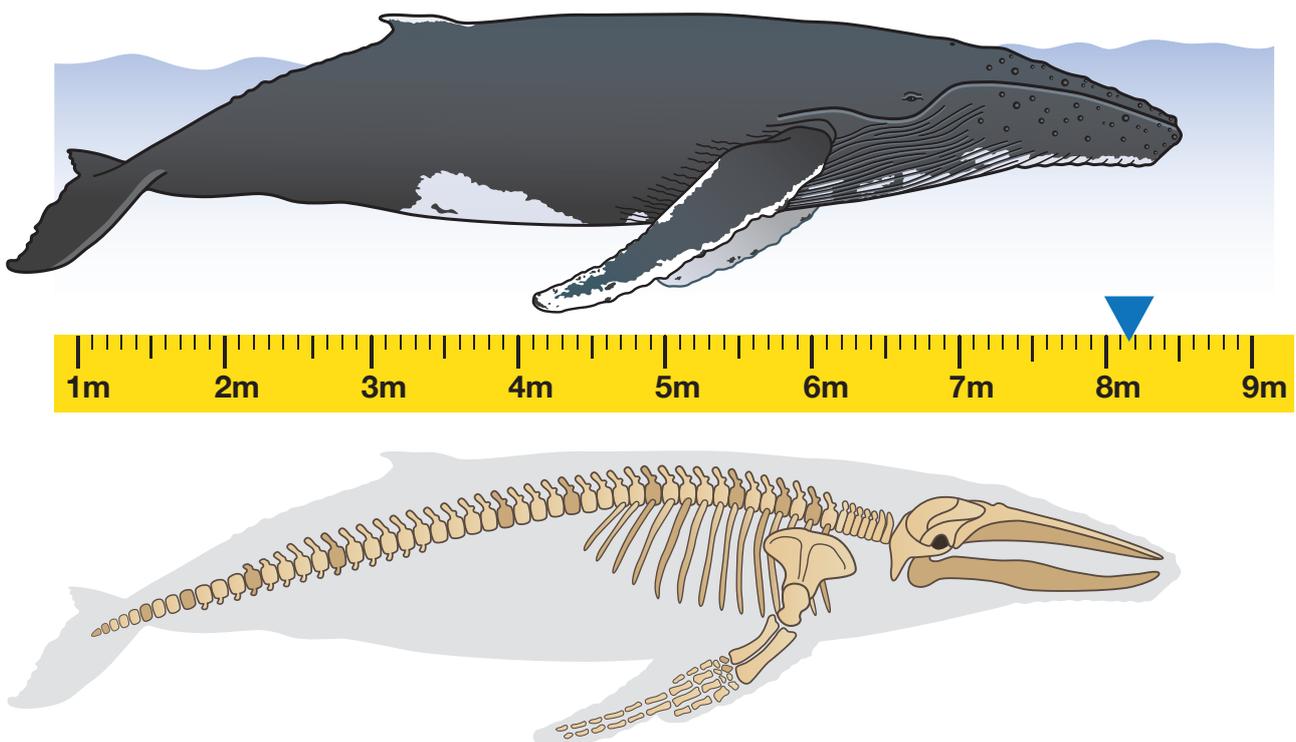
- Describe the humpback whale skeleton.
- How do you think it moved?
- How is it different to you?

This humpback whale washed ashore on the South Wales coast in 1982, at Gileston, near Cardiff. It is from a young whale and measures about 29ft long. As an adult it could reach 58ft long!

Humpback whales are migratory, travelling up to 5,000 miles each year from the North or South Pole in winter to warmer seas around the equator. As mammals, humpbacks must come to the surface to breathe. Typically, humpbacks dive for 5-10 minutes although they can hold their breath for much longer if necessary.

Look at the whale's jaw. It has no teeth; instead it uses baleen (they look like big combs) to capture krill and small fish in the water. You can see specimens of krill in a wall display at the front of the upper natural history galleries.

Humpback whales are known for their songs. Each song can last from a few minutes to half an hour. The song could be for communication or even echolocation (using sound to find food).



Activity ideas

Our Body

Use the **Human Skeleton** resource to prompt your group on naming the parts of a human skeleton. Can you match the bones in the whale to our bones? Can you use the scientific names?

As an extension activity, discuss how your skeleton helps you move and explain how the whale's skeleton is adapted to life in the sea.

Take a picture of the whale and compare it to the basking shark by the Seashore display downstairs. Follow this up by researching the difference between whales and sharks back in the classroom.

Literacy – Listening

Listen to the commentary. It is in English and Welsh. You will hear the song of a humpback whale.

Can you sing like a humpback whale? Discuss why the humpback whale sings a song.

Imagine you are a humpback whale. What would your song be about?

Numeracy – Comparing numbers

Count the number of bones (vertebrae) in the spine of the whale.

A human backbone contains 24 vertebrae. Does it have more, less or the same number as you?

Numeracy – Estimating length

(You may like to bring a measuring reel along with you to verify the measurements)

The humpback whale on display in the gallery is a young whale. A fully grown adult whale will measure approximately twice as long. Walk to where you think the adult tail would be.

What system did you apply to making your estimation?

Use non-standard measures to measure the whale. Why is this not a good way to measure the whale?

Use the tape measure to measure accurately.

PSE / Literacy – Expressing an opinion

How do you feel about hunting whales? We hunt other animals for sport and food, so is this any different?

Make a list of pros and cons. Discuss your feelings with the group.

Write your conclusion summing up your feelings on this topic.

It is illegal to hunt whales in the UK. Some countries hunt whales for scientific research purposes and want to resume whaling for food. What is your opinion?

the leatherback turtle

Explore together

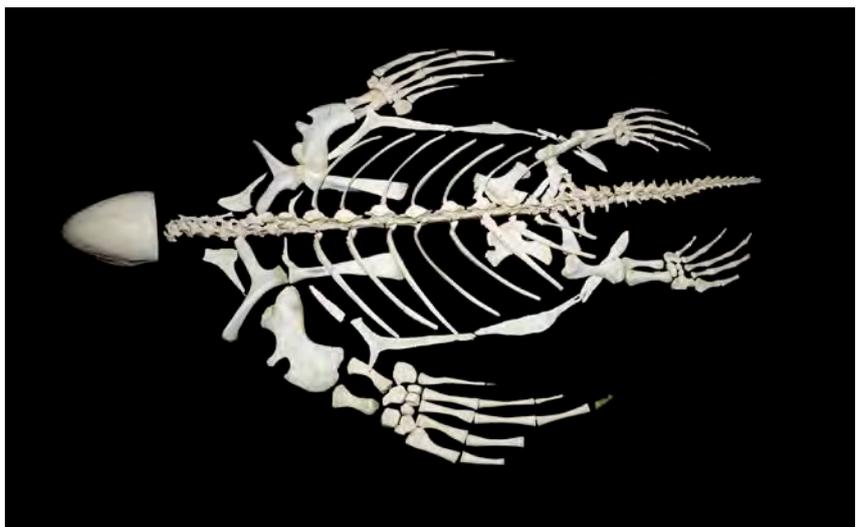
- Why do you think it is called a leatherback turtle?
- Can you find the hook on its chin and spikes on its tongue? Perfect for eating jellyfish.
- The leathery skin protects it from the sting!

This leatherback turtle is the largest turtle ever found. It was 2.8m long and weighed 914kg (about the weight of 11 average sized people). It washed up onto Harlech beach in North Wales in 1988. It was about 100 years old.

A female leatherback turtle will lay her eggs every 2-3 years. During a nesting period she comes ashore up to 9 times, laying up to 80 eggs each time. The eggs take about 65 days to hatch. The 'hatchlings' (baby turtles) dig their way out of the sand and scramble to sea, but only a few of the turtles make it to water.



This turtle drowned tangled up in a fishing rope, and was found with 9 plastic bags in its stomach. Leatherback turtles mistake plastic bags for jellyfish and eat them. Fishing, pollution and loss of nesting sites are key problems facing their survival today.



Scientists find out important information from studying an animal's skeleton. The leatherback turtle's 'hand-like' flippers reveals how closely related we are. Study the skeleton closely to discover other ideas.

Activity ideas

Our Body

Use the **Human Skeleton** resource to prompt your group on naming the parts of a human skeleton. Can you match the bones in the turtle to our bones? Can you use the scientific names?

As an extension activity, discuss how your skeleton helps you move, and explain how the turtle's skeleton is adapted to life in the sea.

PSE

What can you do to help the leatherback turtle? Brainstorm ideas.

Suggest recycling plastic bags, taking part in beach cleans, adopting a class turtle, making posters to put up in school.

Make a poster highlighting what we can do to help the leatherback turtle. Use information from the displays beside the turtle to help you.

Numeracy – Mental strategies

During a nesting period the leatherback turtle comes ashore up to 9 times, laying up to 80 eggs each time.

Calculate how many eggs this is in total per nesting season?

Discuss what mental strategies you can use to calculate the answer. Calculate your answer, then cross check your answer with a member of your group who selected a different strategy.

Literacy – Collective nouns

A group of turtles is called a *bale* of turtles. The leatherback lays a *clutch* of eggs.

Can you think of other collective nouns that may apply to other animals?

Match the animal and the collective noun. (Swarm – insects, Flock – birds / sheep, Herd – cattle / deer, Colony – birds / bats, Litter – cubs / kittens, Shoal – fish, Pack – wolves / dogs)

Can you think of any more? Can you create your own collective nouns for..... rabbits, sharks, seals.

Literacy – Presenting information

Compare and contrast the skeleton of the leatherback turtle with the whale / human skeleton.

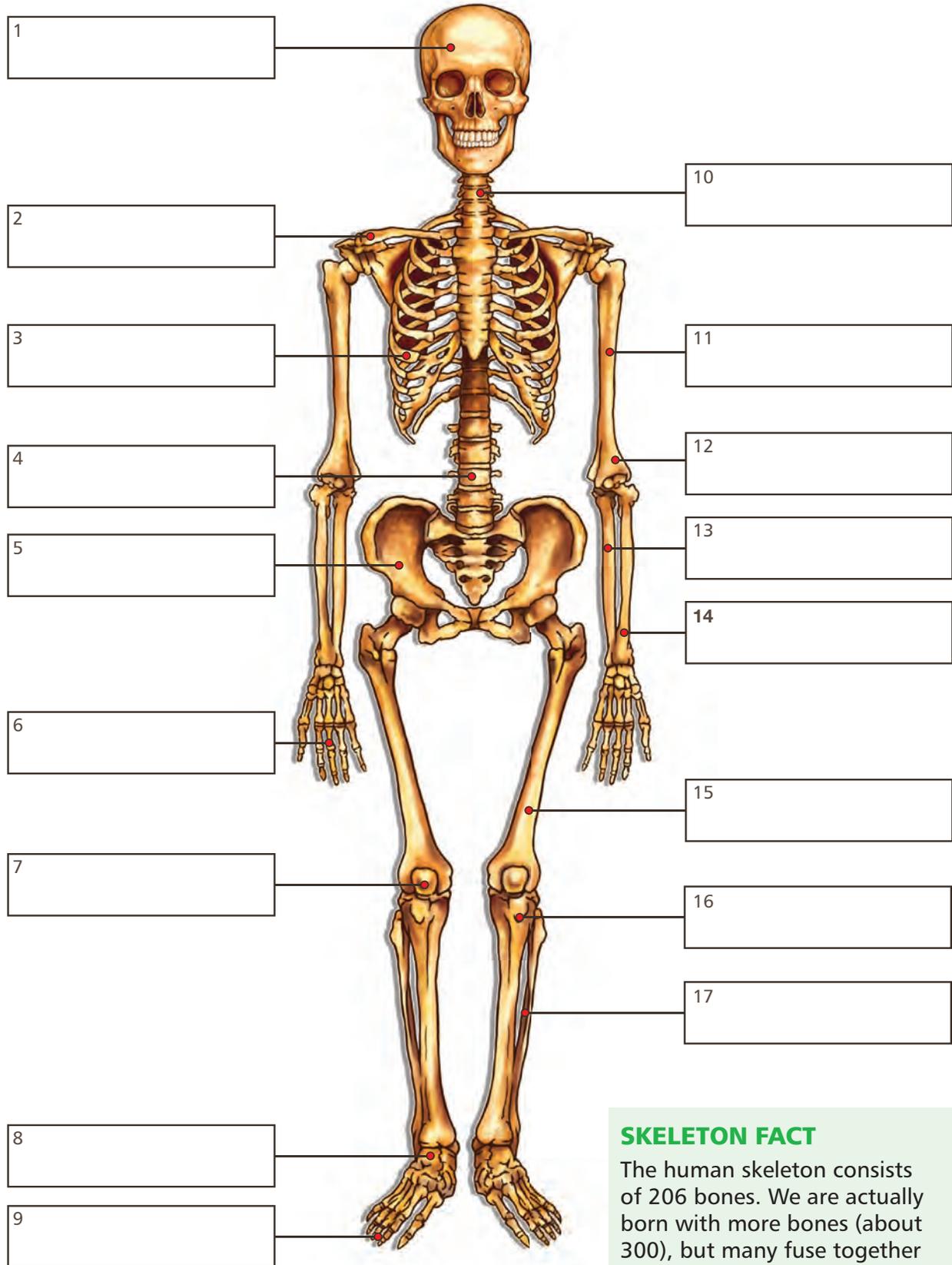
Think of some things that could be done to avoid marine creatures' suffering.

Map showing where the humpback whale and leatherback turtle were found



The Human Skeleton

Can you label the skeleton?



SKELETON FACT
 The human skeleton consists of 206 bones. We are actually born with more bones (about 300), but many fuse together as a child grows up.

Back at school ideas

Life in the Sea

- Read stories and poems about different countries and the animals that live there.
- Use drawings of the creatures done on your visit to create an under-water class display.
- The Museum's Marine Biodiversity department have undertaken surveys of what lives around our coast. There are some activities to help you explore this on our learning website www.museumwales.ac.uk/learning
- Research one animal in more detail, and create a food chain showing its feeding relationships in the sea. Why not make the food chain into a hanging mobile for the classroom?
- Create your own key based on the creatures in the gallery. Use the information from the labels to help you. For example, create a simple key to identify a Mollusc (shell) and an Annelid (worm). What key features do they have? What questions would you need to ask to identify them?



Whale and Turtle

- Explore the feeding relationship between turtles and jellyfish, and create paper plate and tissue paper turtles and jellyfish. Hang them up in the classroom.
- Read stories and non-fiction books about whales. Write about a day in the life of a humpback whale.
- Research different whale species. Record the different sizes and create your own graph of size. Order them by size. What do the biggest whales eat?
- Follow the journey of a leatherback turtle – there are a few online projects which track the journeys of sea turtles. Why not follow one as a class?
- Research threatened and endangered species. The IUCN red data list can be found at www.iucnredlist.org/
- The themes from your visit can be extended into the classroom by undertaking further research into how animals and plants are being protected today. Create a poster showing how we can help sea turtles and/or whales.
- Perhaps your class could adopt an endangered species for a year.



a journey through time

the evolution of wales gallery

Suggestions for exploring this gallery

- There are several ways to explore this gallery. There are many things to see and do and a visit beforehand is recommended to help you plan.
- Walk through the gallery. Point out the way markers in the gallery and discuss what time period you are in.
- Split your class into 4-5 groups and rotate around the displays on pages 31-43. Make sure an adult is with each group.
- Alternatively, focus on one activity from pages 31-43 and explore it in more detail.

This gallery takes you on a journey through time from the 'Big Bang' to the first farmers. Along the 4,600 million year tour you can see meteorites, Moon rock, fossils, dinosaurs and mammoths.

Your visit starts at the beginning of time and passes through many different prehistoric environments. Your progress through the gallery is marked by 'way markers', tall information points with numbers indicating the geological age in 'millions of years ago'.

There are displays of reconstructed environments and cases containing fossils, as well as mounted skeletons and models of ancient creatures.

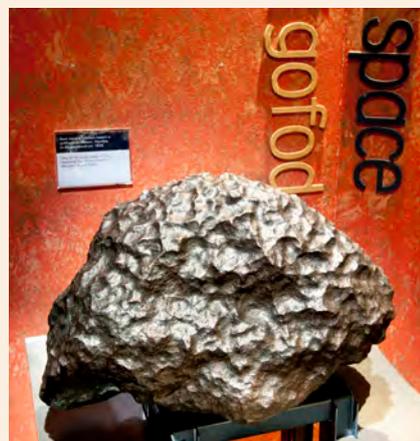
Display panels give further information and video and sounds bring these ancient worlds to life.



stars, meteorites and moon rock

Explore together

- Sit down in the 'star' room and watch the video of the Big Bang. The video loops in Welsh and English.
- Do you know the names of any of the planets? Can you remember the sequence?
- The events that take place on the video began 15 billion years ago. The Big Bang marks the beginning of time and is the moment when our Universe came into existence. What is the oldest thing that you can think of?



This display starts at the beginning of time with a video of the Big Bang and formation of the early Earth.

An iron meteorite is located just beside the Big Bang video. It can be touched. It is the oldest thing you will ever touch. It fell to Earth in Namibia, Africa many thousands of years ago, but the meteorite is actually around 4.6 billion years old!

The meteorite once formed part of the core of a small planet or asteroid that was smashed to pieces during a collision when the early Solar System was formed. It was then in the asteroid belt between Mars and Jupiter. At some point, the meteorite was knocked out of the asteroid belt and sent on its collision-course to Earth. The iron meteorite also contains the metal nickel, both metals make the meteorite very heavy.

Many meteors burn up in the atmosphere before they hit the ground. Small meteorites probably fall on Wales every year but go unnoticed. Most meteorites are found where they both stand out from their surroundings and are not vulnerable to rust, for example in deserts or in Antarctica.

The Moon rock is the most valuable item in the entire museum. Its value is based on the cost of going to the Moon to get another piece. It came from the Apollo 12 mission and is on loan from NASA.

This precious rock is kept in a special airtight container filled with nitrogen to protect it from contamination. At 3.3 billion years old it is older than the most ancient Welsh rock, which is displayed alongside it – at a mere 702 million years old.

www.museumwales.ac.uk/en/Rhagor/article/moonrock/

Activity ideas

The Meteorite

Describe the large meteorite using one word each. Write all these words down. Can you create a group story about the meteorite using all your words?

Do you think the meteorite is heavy or light? How many bags of sugar/ children/ elephants does it weigh? (N.B. You can feel the weight of a meteorite in the Clore Discovery Centre)

The Moon rock

Discuss how the Moon rock got to the Museum? Think about sequences – what happened first? What happened next?...

How might you get to the Moon? Write down your journey.

Literacy – Explain information and ideas

The Goodwill Moon rocks

Towards the end of the Apollo 17 mission on 13 December 1972, Eugene Cernan and Harrison Schmitt – the last men to have set foot on the Moon – picked up a rock.

Cernan announced: "We'd like to share a piece of this rock with so many of the countries throughout the world."

His wish was fulfilled.

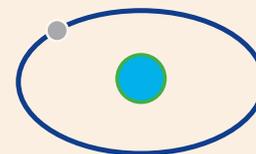
What would you wish to share with the countries throughout the world? Discuss your ideas.

The Moon rocks are very precious and valuable. What is the most valuable or precious thing belonging to you? How do you look after it or keep it safe?

Numeracy – Mathematical language and shape

The Moon's path around the earth is in the shape of an ellipse.

Talk about how an ellipse is different in shape to a circle. Draw an ellipse shape in the air. Is it different to an oval shape?



The distance of the Moon from Earth will vary. This means it is not the same at all times. Use your understanding of the term ellipse to think of a reason why the Moon is closer to, or further from the Earth at different times of the month.

The average distance between the Moon and the Earth is 384,403 kilometres (238,857 miles).

What is meant by average distance? How would you go about calculating the average distance?

volcanoes and coral reefs

Explore together

- Watch the video of the volcanic eruptions. Notice how there are different types of eruptions. Explore the volcanic rocks in the display cases.
- Look closely at the coral reef scene. There is a video of a present day reef projected on the wall behind the display. Use your imagination to bring the model reef to life.
- Compare the models to the fossils in the display cases – can you match the model to the fossil?

The volcano video and the reef scene show how conditions would have been 470 - 425 million years ago, when Wales was under the sea. Underwater eruptions of lava cooled to solid rock, which gradually built up to break the sea surface and form volcanic islands. These rocks can now be seen in Snowdonia.



Volcano

The video shows eruptions in Iceland and Hawaii. It also shows Mount St. Helens in America exploding. The rocks on the left and in the middle are a selection of lava and volcanic bombs, the ones on the right are pumice (frothed rock, with lots of gas bubbles) and obsidian (volcanic glass). Pumice is often so light it can float on water!

Coral reef

This reconstruction is based on fossils found around Wales. Fossils are formed when an animal or plant is buried in sediment, and the soft tissues rot away leaving only the bone or shell, or an impression. Fossils are only found in sedimentary rocks, for example limestone and shale.

These animals lived in different communities depending on their depth, so they were arranged on underwater slopes in successively deeper parts. The water was mainly shallow and tropical with an environment similar to that of the Caribbean or the Red Sea today.

Further around the corner you can see more undersea animals from an ancient reef. The rocks of Ogmore-by-Sea are made of the bodies of ancient coral-reef creatures like these.



Activity ideas

Explosive Volcanoes

Try to imagine how hot the lava in a volcano would be. Heat from deep within the Earth is hot enough to melt rocks! Can you describe the molten rock in the volcano video? Why is the rock red? Compare a river of water to a river of lava.

Literacy – An erupting volcano

Draw a diagram of an erupting volcano. Label the diagram explaining what is occurring during the eruption.

Presenting News

Imagine you have witnessed the eruption of a volcano. Think of some sentences you might tell the reporter who was interviewing you. Try to include adjectives and wow words which convey the amazement of the event.

Changes in State

What happens as the lava reaches the sea? Why? Which things are boiling (turning from a liquid into a gas) and which are freezing (turning from a liquid into a solid)?

Have a look at the heated rocks in the video. When they have cooled they have changed. Do you think this is a reversible change?

Find some differences between rocks made in volcanoes and rocks made under the sea. Would you find fossils in lava? Why not?

Fossil Corals

What animals can you see in the coral reef? Do any of them look like animals that are alive today? Compare the animals in the coral reef to the fossils that we have found (in the case next to the display).

Which parts of the animals have been fossilised? Why do you think this is?

Numeracy – Data handling *(requires squared paper and ruler)*

Many of the coral reef creatures have naturally occurring patterns.

Count how many different creatures you can see in the coral reef display. Draw a table recording the number of various creatures to be seen.

Try presenting the information you have collected in different ways – for example bar charts, pictograms.

Numeracy – Repeat addition and multiplication

Take a look at the crinoids. How many tentacles does each crinoid have?

How would you go about calculating the total number of tentacles you can see in the display case? Can you think of different strategies? Check the accuracy of your answer by using a different strategy.

the coal forest

Explore together

- There are 2 parts to this display – the reconstruction of the coal forest, and the display cases of fossils and coal.
- The reconstruction area is great for exploring what the forest looked like and the fossils give you the evidence.

The coal forest shows what south Wales would have looked like 300 million years ago. At this time Wales lay close to the equator, like tropical rainforests today. Giant plants that were related to modern mosses and horsetails grew in enormous swamps, criss-crossed by river channels. Ferns and conifers formed forests on the banks of the rivers.

In the display there are giant cockroaches, a giant spider, a small amphibian and a giant dragonfly.



These ancient dragonflies and cockroaches were much larger than insects today, partly because they had no predators, but mainly because oxygen levels in the atmosphere were much higher. Smaller insects also existed at this time, but most of the well-known modern insects such as butterflies, bees and flies did not evolve until the time of the dinosaurs.

As the plants living in and around these ancient swamps died and fell into the ooze, they slowly built up into a thick deposit of peat. This was buried by sand and mud carried by the rivers, which regularly flooded. Eventually the alternating layers of peat, sand and mud were transformed into the famous coal-bearing rocks of Wales. As the peat was buried deep within the Earth it was heated, squashed and transformed into coal.

The floods also swept up plant debris, which was preserved in the mud, forming fossils. There are examples of some fossils from south Wales in the gallery and a large lump of coal which can be handled.

These luxuriant tropical swamp forests eventually disappeared, due to a number of reasons including the movement of the continents and global cooling and warming.

Activity ideas

The Reconstructed Coal Forest

Which of these animals are insects? How can you tell?

Has an insect ever landed on your hand? How did it feel? Can you imagine having insects this size land on your hand? How would you feel walking around in a forest like this?

Literacy – Watching and listening

Watch and listen to the video of the life cycle of the plants in the forest. Make some notes as you are watching and listening.

Sequencing

Find the displays which show how coal was formed. Discuss the sequence of events which led to the forest being turned into coal. Draw a series of diagrams which include explanatory notes detailing how coal is formed.

Victorian Coal Mines

What do you think life was like for a Victorian child-miner working in a coal mine? Imagine you were working in the mine and you found the fossil of a giant spider. What would you think?

Sharing Ideas and Information

Coal is a finite resource. This means more coal is used up than can be made to replace it, as coal takes millions of years to form. Can you think of some other resources which are finite?

What kind of problems occur as a result of burning finite fossil fuels such as coal?

Numeracy – Creature counting

Look at the giant sized creatures. Count how many different kinds of creatures you can see.

Activity ideas

Ratios

It can take a layer up to 10 metres of swamp material, peat, to make a layer of 1 metre of coal. This is known as a ratio.

Suppose it took 5 metres of swamp material to make one metre of coal. How much swamp material would it take to make 2 metres of coal? What about 3 or 4 or 5 metres of coal?

Change the ratio to 7:1. What effect does this have on the amount of coal produced?

Presenting Data *(requires squared paper and a ruler to draw a graph)*

Draw a table to record your calculations assuming a ratio of 5:1. Show your results in a line graph.

Change the ratio of swamp material to coal. What happens to your calculations when you change the ratio? What effect does it have on your line graph when you plot the new ratio?



dinosaurs

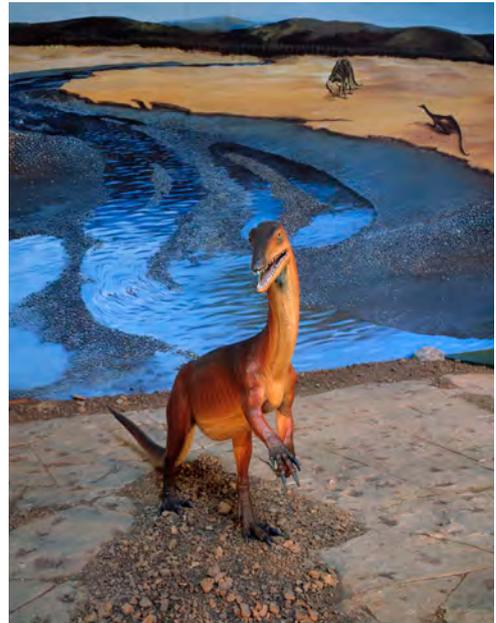
Explore together

- It is best to work in small groups in this space.
- There are not many places to sit and the sound is loud.
- Start with finding the dinosaur names to allow the children to explore on their own. The names can be found on the display panels.
- Next, complete 1 or 2 of the activities.

On the right hand side of the gallery is a display of desert dinosaurs from 205 million years ago. The skeleton furthest to the right as you look at the display is *Plateosaurus*, a herbivore. The left one is *Megalosaurus*, a carnivore.

The small dinosaurs have been reconstructed from skeletons of *Coelophysis*, a small meat-eating dinosaur that weighed about the same as an eight year old child. It probably ate lizards and small mammals.

Fossils, such as dinosaur bones are formed when an animal dies and is buried in sediment. Its soft tissues rot away and only the bone remains. Over time the sediment solidifies into rock and the bones become fossilised. Many of the skeletons and bones that you can see are casts or models but there are genuine fossils on display as well.



The dinosaurs on the left hand side are from the later part of the dinosaurs' existence, 135-65 million years ago. The large dinosaur skeleton in the forest is made of the actual fossil bones of an *Edmontosaurus*, a herbivore. The large leg bone is also a real fossil from another herbivore called *Apatosaurus*, and the small skeleton is from a small carnivore called *Hypsilophodon*.

A model *Tyrannosaurus rex* skull can be found displayed high up on the wall just beyond *Edmontosaurus*.

Explore the displays to discover more dinosaur evidence. Find the feathered dinosaur/bird

Archaeopteryx, and even examples of dinosaur poo!

Activity ideas

Dinosaur Bingo

Photocopy the dinosaur wordsearch resource before your visit. Pupils work in pairs to find as many of the dinosaurs as they can. It is very tricky as the names are in the display panels in front of the dinosaurs.

Dinosaur Descriptions

Ask each member in the group to think of three sentences to describe their favourite dinosaur in the gallery. Can the other group members work out the name of the dinosaur based on the description?

Dinosaur Adaptations

Look at the dinosaurs in the desert. What colours do you think these dinosaurs would be? Why? (think about camouflage). Do you think it is easy to live in a desert? Why?

Compare these dinosaurs to *Hypsilophodon* (the small dinosaur in the forest) and *Edmontosaurus* (the large dinosaur in the forest). What colour do you think these dinosaurs would have been?

Teeth and Feeding

Look at your friend's teeth – what kind of teeth do they have? What are they good for eating?

Look at the dinosaur teeth. What food do you think the different dinosaurs ate? Sharp and pointy teeth are used to eat meat! Look at their claws for clues too – sharp claws generally mean a meat eater.

Literacy – Herbivore or carnivore?

Discuss the meanings of the word herbivore and carnivore. Give two *post-it* notes to each child in the group. Ask them to write one food item eaten by an herbivore and one food item eaten by a carnivore.

Collect the *post-its* from the group. Sort them into food for the herbivore and food for the carnivore.

Would the dinosaurs be able to eat all of the food you have listed? Think of something the herbivore and carnivore dinosaurs may have eaten.

Numeracy – Estimation

Estimate the size of the *Apatosaurus* dinosaur leg bone on display and then try to imagine the size of the dinosaur to which it belonged. Measure the leg bone and your height. Is it bigger or smaller than you?

Activity ideas

Numeracy – Follow the rules! *(A measuring tape is required for this task)*

One method for estimating the size of a dinosaur is to use the rule ***hip height equals four times the length of the hind footprint***.

Measure your foot. What is the best unit of measurement to use? Double it, and double it again. This would be your hip height if you were a dinosaur.

Measure your true hip height. How close is your true hip height to your dinosaur height?



the ice age

Explore together

- It is easy to miss some of the displays in this section as children are so excited by finding the woolly mammoths.
- Don't miss the laughing hyena in the cave, the wolves above you as you leave the cave, and the hippo jaw.

The display starts with a dark cave, which can frighten some children. By this time Wales was in its present position on the globe.

From 1.6 million years ago until the present day, Wales has been in an ice age. An ice age is defined by the presence of polar ice caps. During this time cold phases called *glacials* have alternated with warmer phases called *interglacials*. The sea levels fluctuated dramatically, because so much water was locked up in these vast glaciers.



In the cave a full size mammoth and her baby can be seen and a hyena lurks in an alcove. Outside on the cliff face are wolves and a wildcat. There are full skeletons of a mammoth and a giant deer, and reconstructions of a bison and a woolly rhinoceros.

The male giant deer had the largest antlers of any deer ever, supported by huge neck muscles. They were used to intimidate rivals and to impress potential mates.

As well as finding the bones of these huge mammals, scientists have also discovered whole frozen bodies, which has helped us to learn a lot more about them.

The immense erosive power of the glaciers, and the melt water which they produced was important in shaping the Welsh landscape.

Activity ideas

Keeping Warm

Think about how cold the Ice Age would have been. How do you keep warm in cold weather?

How do you think the ice age animals kept warm? Make drawings and take photographs to help record your visit.

Adaptations to Cold

Find the woolly mammoth and the woolly rhino. Draw one of them. Look at the different adaptations that these animals have for cold climates. Label your drawing with the features that help them survive e.g. woolly fur, small ears, tusks, large feet.

Which animals alive today would survive an ice age? Do you think you would?

Literacy – Night in the Museum

Write a story in which, one night, all the animals in the Ice Age gallery come to life. What happens next?

Literacy – Leaving a record

Stand in the cave and imagine you lived here during the Ice Age. What would you be wearing? What food would you have to eat? How would you cook it?

People who lived in the Ice Age left drawings on cave walls which help us to know about the Ice Age period.

Pretend you are a cave dweller from the Ice Age. Use the display in the gallery to help you draw a picture of one of the animals which you would have seen at the time. List the features the animal had to help it live in such a cold environment.

We are able to record our world as it is today using many different forms of media. Think of some different ways we could record information for people in the future to learn about our life today.

Make an Ice Age Menu

What would you have eaten in the Ice Age?

Time Box

Choose some items you would include in a time box which would help people understand how we live today. Justify your choice.

Activity ideas

Numeracy – Counting and comparing creatures

There are many animals hiding in this gallery. How many can you spot? Some of the animals are quite small, and others are large.

Which animal do you think is the largest / smallest? Which ones are larger or smaller than you?



Back at school ideas

Stars, Meteorites and Moon Rock

- Find out more about our solar system. Why is Earth the only planet to have life?
- Discuss or write a story about the journey the meteorite has had from space, through the atmosphere, landing on Earth and ending up in the Museum. Compare it to how the Moon rock ended up in the Museum



www.museumwales.ac.uk/en/Rhagor/article/moonrock/

- Research the story of the 'Goodwill Moon rocks' further

www.collectspace.com/resources/moonrocks_goodwill.html

Volcanoes and Coral Reefs

- Make your own volcanic eruption by mixing vinegar and bicarbonate of soda. Surround your 'volcano' with a cone of card, and build the flow of the lava on the cone after the eruption in plasticine. You can extend this activity by exploring the reaction of a base and acid.
- Explore materials which change from a solid to a liquid (wax) and a liquid to a gas (water) on heating.
- Find out where coral reefs are found around the world today.
- Make your own fossils using plasticine, plaster of Paris and shells.

Coal Forests

- Make impressions of leaves and ferns in clay to remind you of the fossils you have seen, or press leaves and flowers inside a book.
- The coal forests were an ancient tropical rainforest. Find out where rainforests are in the world today and what threats they face.
- Find out about the life of a Victorian child-miner working in a coal mine. Imagine you were working in the mine and you found the fossil of a giant spider. What would you think?

Back at school ideas

Dinosaurs

- The small dinosaurs left footprints near Barry. Write a story about going on a trip to the seaside and meeting a small dinosaur like this one.
- Make your own 'Ichthyosaur poo' by breaking up bits of shell (to simulate a marine reptile chewing them) and mixing them with air-dry clay.
- Create a cartoon strip showing how fossils are formed.
- Explore different dinosaur footprint images in books and online. What stories can footprints tell? Can they tell you more about the kind of dinosaur it is? How can footprints tell us how fast an animal moved?



Ice Age

- Use your drawings of the Ice Age animals in the gallery to help explore animal adaptations to life in the cold. What animals are alive today that can survive the extreme cold? What features help them survive?
- What were humans like during the Ice Age? What adaptations did those early humans have to help them live in an ice age?
- Discuss or write a story in which, one night, all the animals in the Ice Age galleries came alive. What would happen?
- At the end of the Ice Age many animals became extinct. Find out about animals that are threatened or on the brink of extinction today. Why are they endangered? What can we do to help?



the natural world gallery

Explore together

- The gallery is split into 2 displays.
- One display shows you our planet's biodiversity. Explore the different groups. Which group do we belong to? Use the pie-chart on the floor to help you.
- The other display features a spectacular range of minerals from around the world.

BIODIVERSITY means 'diversity of life' and is a term used to describe all of the Earth's living things. The displays in this area feature the major groups of animals, plants and fungi. They are grouped together (**classified**) according to similarities.

The mineral gallery shows you the range and form of minerals found on our planet. There are a range of different coloured minerals in this gallery.

Minerals are the ingredients that make up rocks. Crystals are minerals.

Minerals occur naturally, which means man-made substances, such as steel aren't minerals. Minerals are Inorganic, which means they are not made by a living organism. They have a regular crystal structure and a definite chemical formula. Minerals are commonly identified by the physical properties they possess – hardness, colour, crystal shape, specific gravity (a measure of density), and streak (the colour of the mineral in the powdered form).



Activity ideas

Adaptations and Sorting

Explore the different features of the animal and plant groups in this gallery. Why have we grouped certain animals together? What features do they share?

Look closely at the snow leopard, chipmunk and vervet monkey. What features do they share?

Find the carnivorous (meat-eating) plants. Can you work out how they might catch their food?

Animal Senses

Choose your favourite animal. Why did you choose it? Think about how it uses its senses to help find food and communicate.



Number and Shape

Play counting games – how many animals with 2 legs can you find? 4 legs? 6? 8? 10? More?

Shape and Colour

Minerals grow naturally in many different shapes and sizes. How many shapes can you spot?

There are many colours in this gallery. Play games looking for different colours. How many can you find?

Literacy

Feel the quartz crystal and amethyst crystal. What do they feel like? Choose some descriptive words. Do they feel different to each other? How?

Time Box

Choose some items you would include in a time box which would help people understand how we live today. Justify your choice.

specimen information

Here is some information about a selection of the animals, plants and minerals on display in this gallery. Why not do your own research on the specimens that you find most interesting.

Diversity of Life

Pufferfish *Tetradontidae*

Pufferfish are slow, clumsy swimmers which makes them vulnerable to predators. However they can quickly ingest huge amounts of water to puff themselves up into a virtually inedible spiky ball. Despite being super poisonous, certain parts of the pufferfish are a delicacy in Japan. Only a trained, licensed chef is allowed to prepare them for eating, as one false move could mean death.



Coco de mer

Look for the huge seed with 2 halves. They come from a palm tree in the Seychelles and are washed up on beaches around the Indian Ocean. They are the largest seeds in the plant kingdom and can weigh 30kg (about 4½ stone). They are threatened from over-collection, fire and invasive plants.

Pitcher Plant

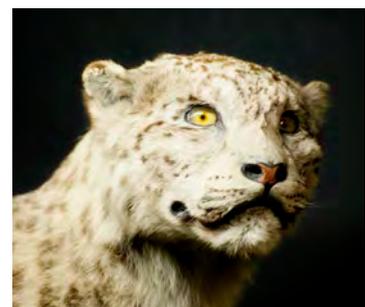
Pitcher plants are carnivorous (meat-eating). They have a deep pitcher (like a cup) called a pitfall trap. Flies are attracted to the plant by its colour or by the promise of nectar, but once inside insects have difficulty getting out. Pools of liquid inside drown the insects and break them down into food for the plant.

Buzzard *Buteo buteo*

The buzzard is the UK's commonest bird of prey. It is large with broad, rounded wings and a short neck and tail. It uses three main hunting techniques—locate prey from a perch and fly direct to it; hover above the prey before dropping onto it; or forage for small insects on the ground. Look how sharp its beak and claws are!

Snow Leopard *Panthera uncia*

Snow leopards are well adapted for living on mountains. Their long fur is essential for surviving the harsh cold weather. They use their short forelimbs and large paws for walking on snow, their long hind-limbs for leaping and their long flexible tail for balancing. Researchers estimate that there are only between 3,500 and 7,000 snow leopards left in the wild because of hunting, habitat loss and poaching.



Minerals

Calcite

A very large cream and brown coloured mineral in a separate case, by the entrance to the minerals display. Calcite is made of calcium carbonate, the same substance that limestone and chalk are made of.

Quartz

The large spiky, clear-coloured crystal in the middle of this room is quartz. Quartz is found in many different types of rocks and can be many colours. These transparent quartz crystals are a variety known as rock crystal – clear quartz crystals are what most people think of when they think of a crystal. Quartz is used to make glass: most glass is made by melting sand containing lots of tiny bits of quartz. Other types of quartz, include amethyst (purple), rose quartz (pink), and citrine (orange).



Malachite

The distinctive light and dark green bands make malachite a famous and very popular semi-precious stone. It is named from the Greek word for “mallow,” a green herb. Its banded light and dark green designs are one-of-a-kind.

Pyrite

The brassy metallic look of pyrite has caused people to mistake it for gold, which has earned it the nickname ‘fool’s gold’. Pyrite is much harder than gold and cannot be scratched with a fingernail. Gold is malleable, meaning that it can be shaped by hammering, but pyrite is brittle and crumbles if hammered. Pyrite is a very common mineral, which comes in many crystal shapes from cubes to dodecahedrons. It can sometimes decay in warm moist air, giving off a rotten egg smell caused by a slow release of sulphur dioxide.

answers to popular questions

1. Can we touch them?
2. Are they real?
3. Are they alive?
4. Did we kill them for display?
5. What happens behind the scenes of the museum?

1. Can we touch them?

Unfortunately you can't touch the majority of displays and specimens in the galleries. This is because touching wears away the surface of an object over time and we would like the displays and the specimens to look great for future visits. In particular, please don't touch the 'snow' in the woodland, as there won't be any left! There are some touchable objects – touch panels, and clearly marked objects.

If your group want to touch more objects, you can book a visit to the Clore Discovery Centre, where over 50 handling drawers enable the pupil's greater exploration of our Museums treasures.

2. 'Are they real?'

Lots of children will ask 'are the animals real?'

Most are, but some are not. Generally, the mammals (fox, badger, squirrel etc...) are stuffed animals. A person called a Taxidermist prepares the animals before they are given to the Museum. The insects and other invertebrates (crabs, shells, spiders etc) cannot be stuffed, but are dried to preserve them.

Some things cannot be preserved easily – the basking shark at the front of the gallery is not real. Some of the plants are not real; they have been made either with resin or wax. This is because when you dry plants you lose some of their colour and they become brittle.

As you walk around the galleries try and spot the animals that are real and those that aren't.

3. 'Are they alive?'

The displays are full of things that were once alive, but some e.g. rocks, sand, soil, were never alive. Perhaps as you walk around you could spot things that were once alive and those that have never been.

4. Did we kill them for display?

We don't kill animals for displaying in the galleries. However, some of the old Victorian collections were collected in this way. Victorian explorers and scientists would travel the world and bring back collections of animals for display. You could ask your group to think about why it might have been acceptable in Victorian times to do this and why it is not today.

5. What happens behind the scenes of the Museum?

Behind the scenes of the Museum people carry out work and research on the collections.

A collection is a group of objects that have one thing in common that have been brought together for a given purpose. Museums all over the world have collections. The National Museum Wales has many collections including archaeological, geological, art, industrial and biological collections.

Why do we have collections?

- To protect them for the future
- For comparison of species and habitats
- Identification
- Education
- Research

kwl chart

You may like to prepare the children for their visit to the museum by completing a KWL chart.

Discuss with the children what they already know and what they want to know before the visit. After the visit, the column *What have I learned?* may be completed.

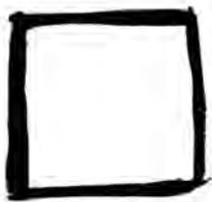
The chart may be prepared by each individual child, a group of children or just one KWL chart for the whole class.

What do I k now?	What do I w ant to know?	What have I L earned?

Let's go on a shape hunt

The animals and plants in the Natural History Gallery are made up of lots of shapes and patterns.

How many of these can you spot on your visit?





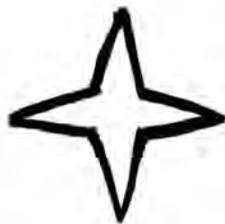


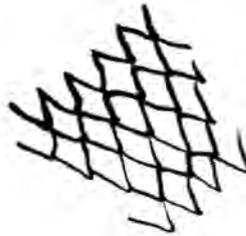






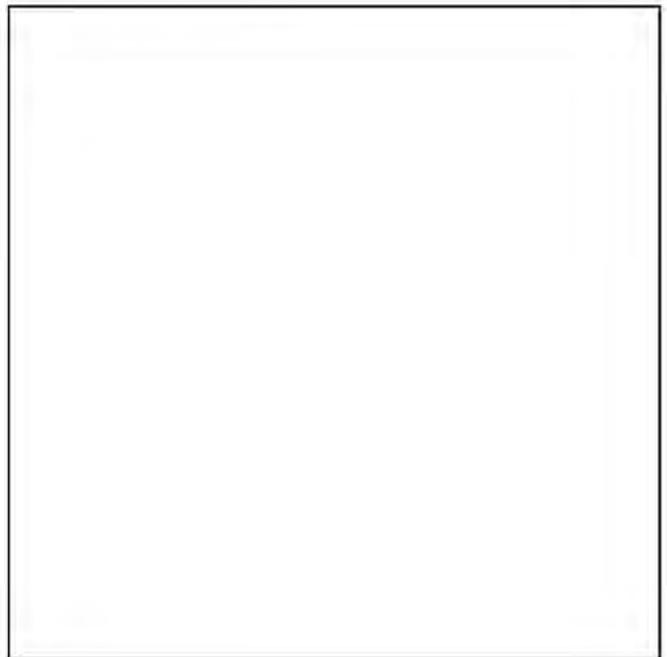
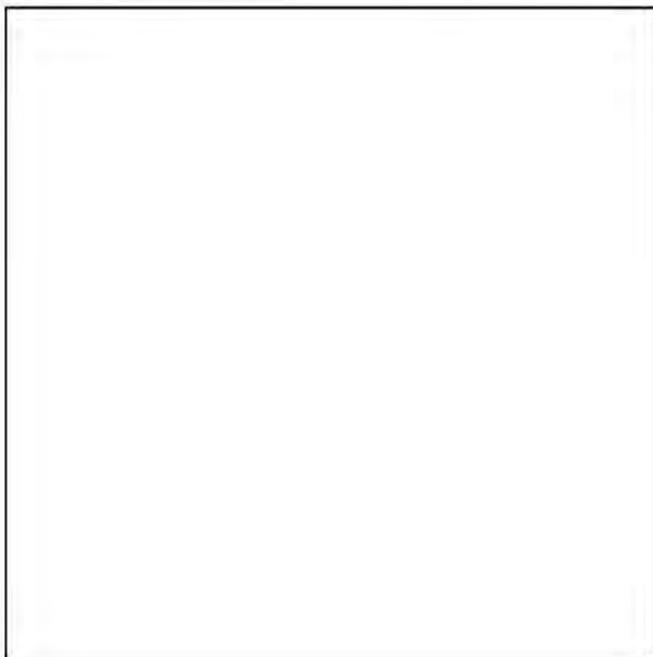






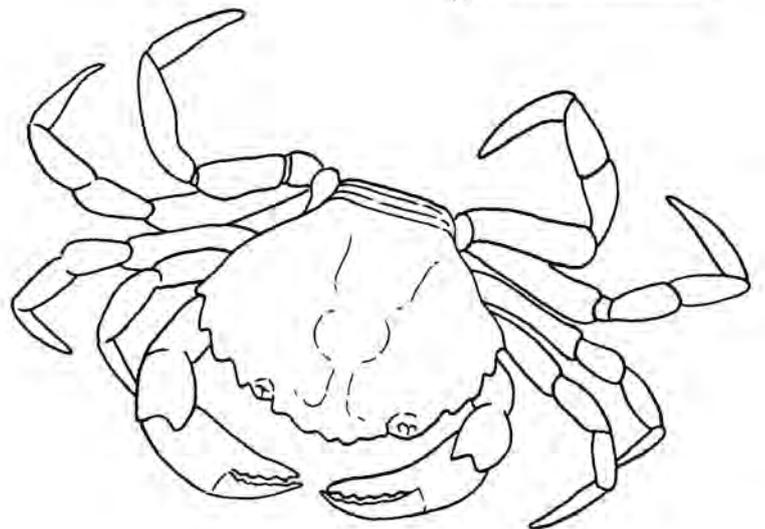
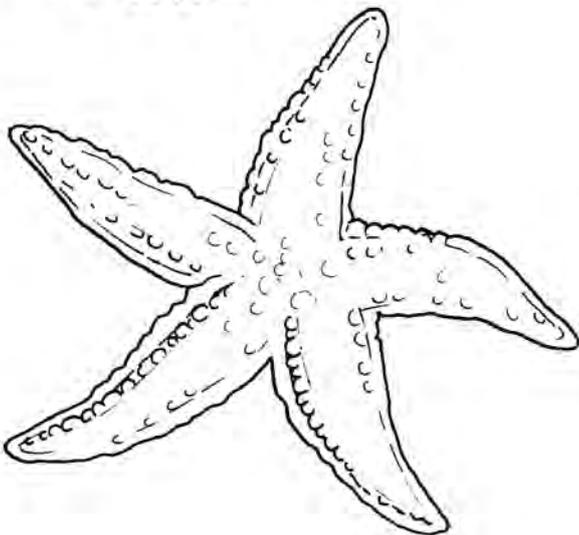
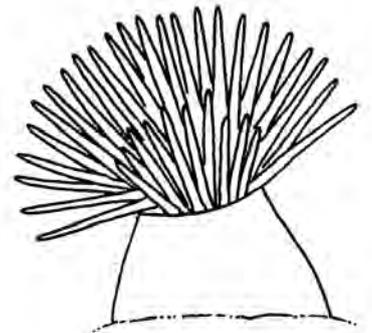
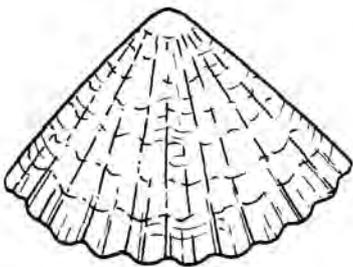
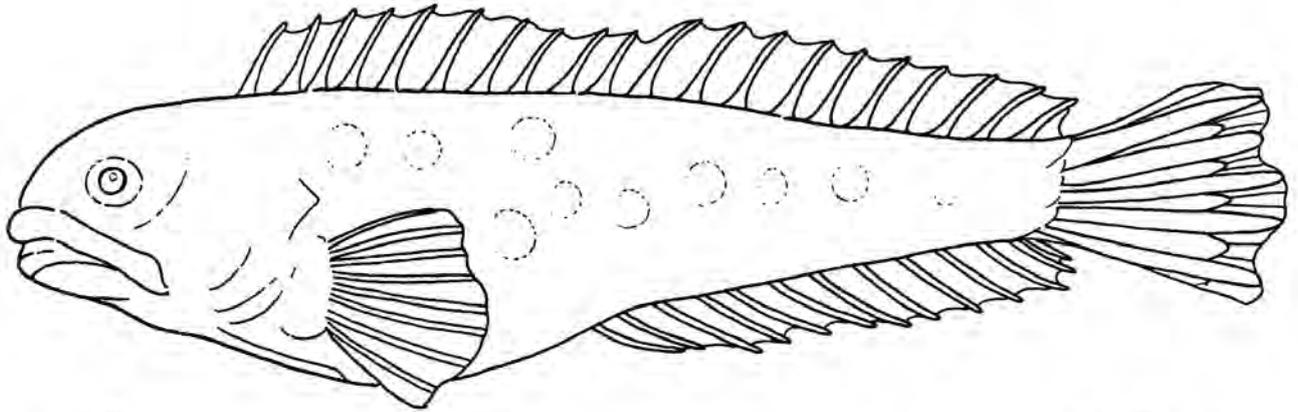


Can you find any other shapes and patterns? Draw them here.



THE ROCKPOOL

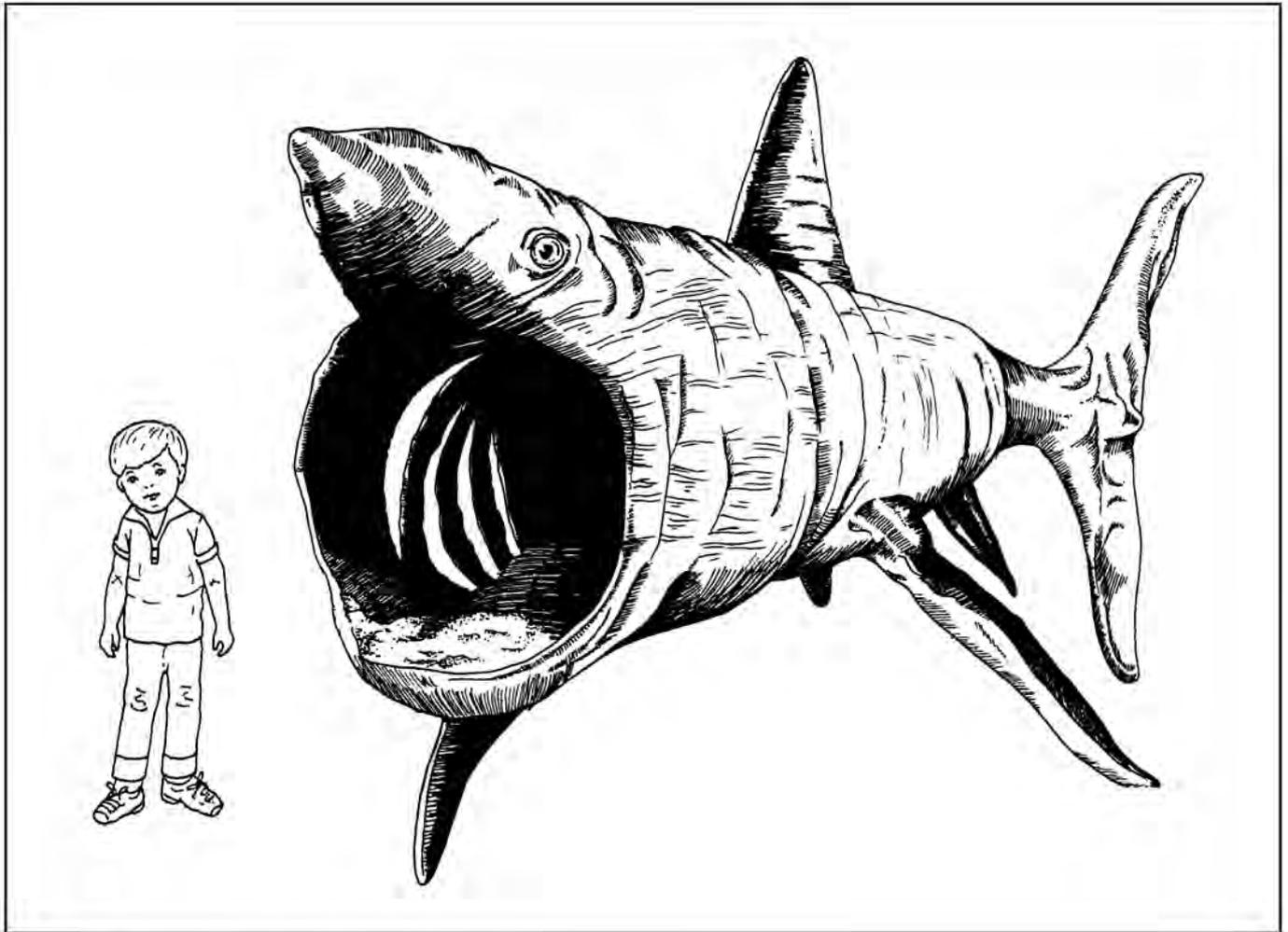
Look in the rockpool.
Can you see these animals?



Colour them using the correct colour.

THE BASKING SHARK

The average basking shark is about 9 metres long (the same as a double decker bus).



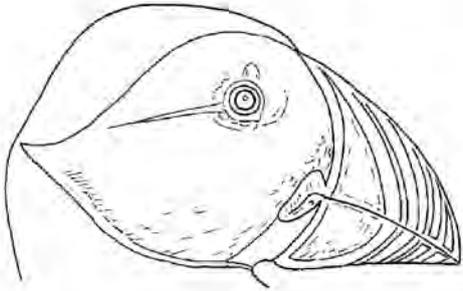
Watch the video beside the shark.
(You may have to wait for the video to start).

What does the basking shark eat?

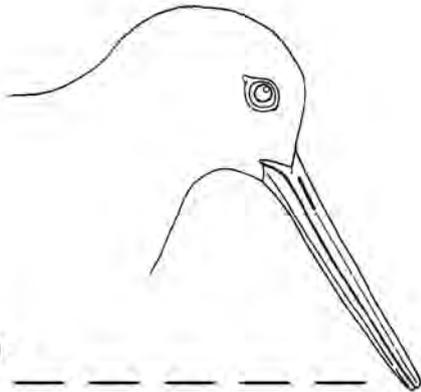
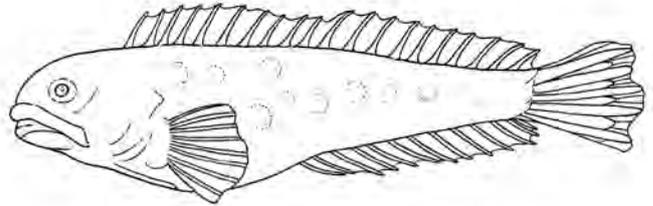
How do they collect their food?

SEASIDE BIRDS

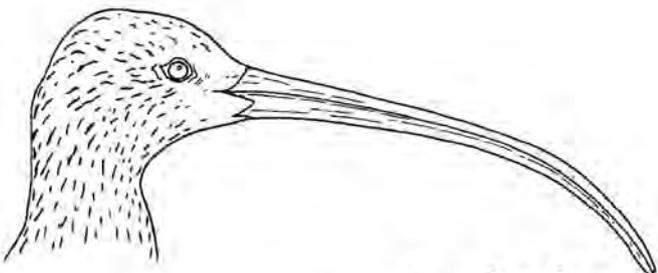
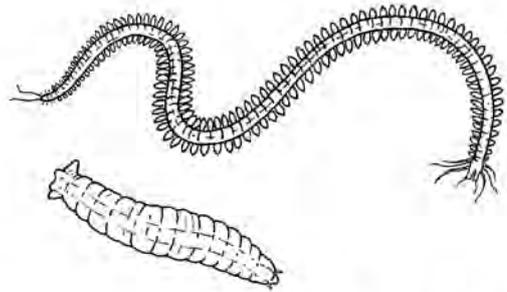
Match the bird to its food.



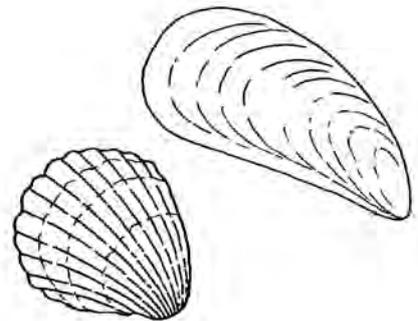
p _____ s tear fish



o _____ c _____ s crack shells



c _____ s dig for worms



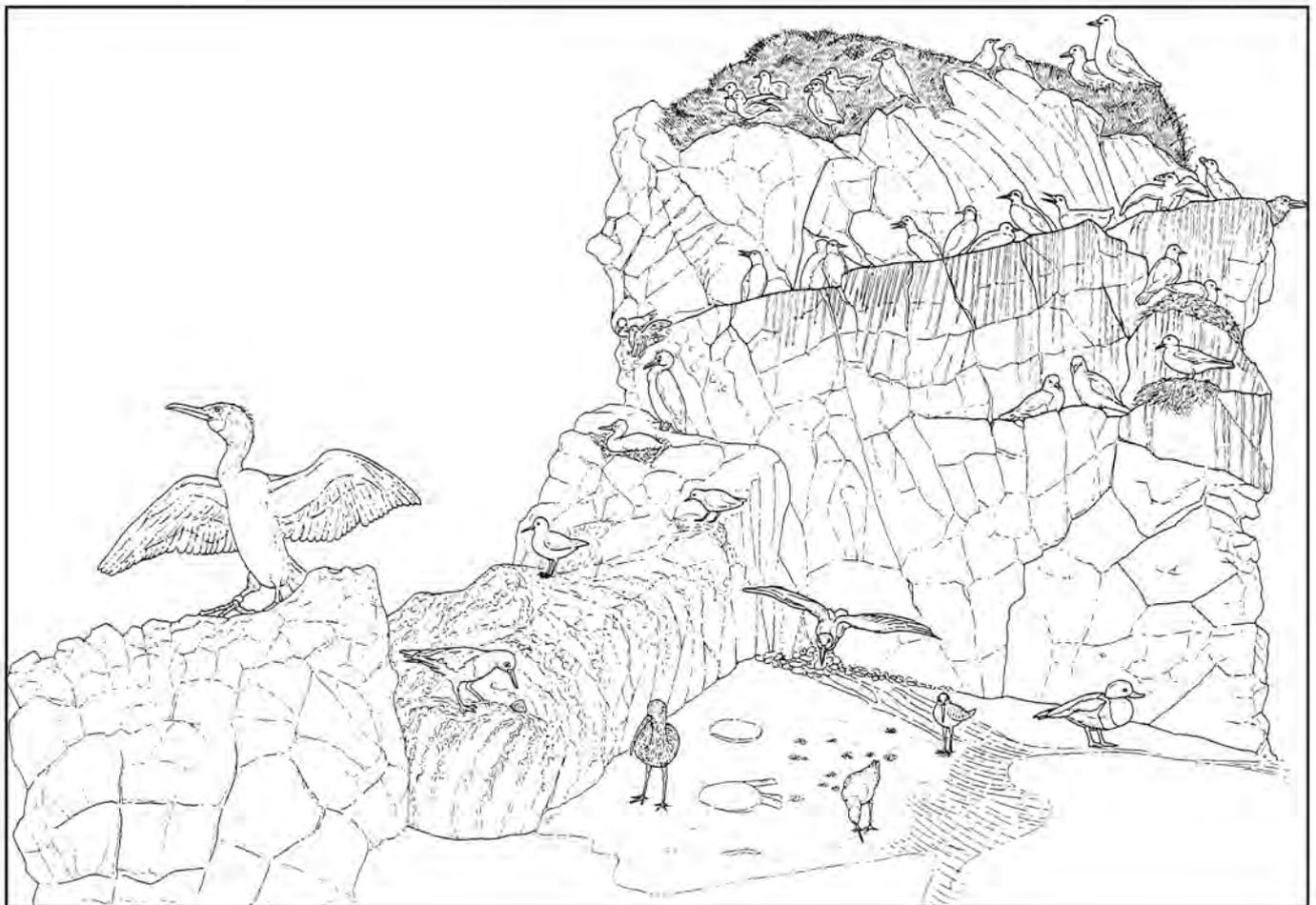
Explore the other birds in the display. What do you think they eat?

THE SEASHORE

This is a model of a sea cliff from Skomer island which is off the coast of South West Wales.

There are many animals and plants on the seashore. See how many you can find and label them. Now colour it in.

puffin				
--------	--	--	--	--

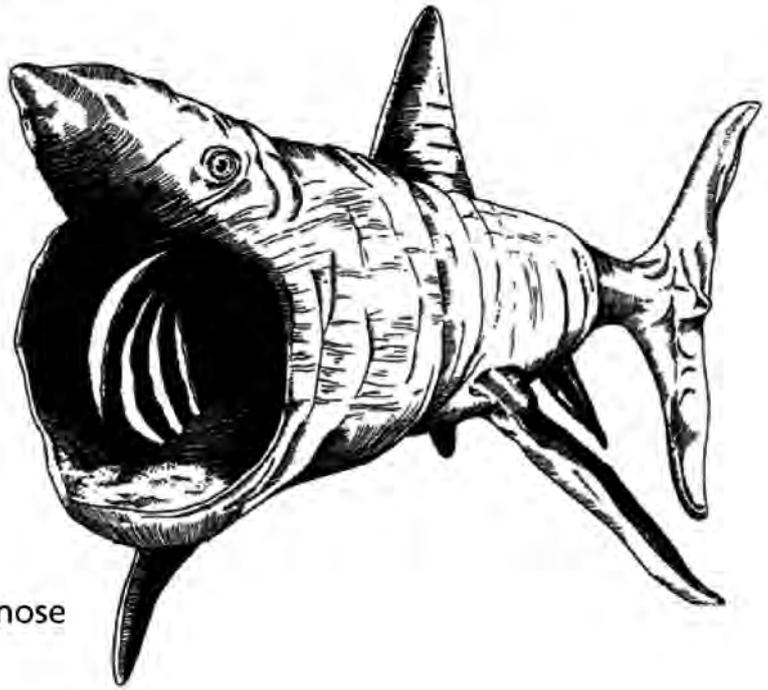


--	--	--	--	--

The Basking Shark

The Seashore

Look closely at the Basking Shark.
Circle all its key features.

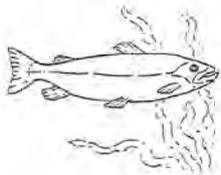


- gills
- scales
- big mouth
- feathers
- tough skin
- fur
- wings
- caudal fin (tail)
- teeth
- dorsal fin (back)
- big nose

Do you think all sharks share these features?

Does the Basking Shark have any teeth?

Watch the video. What food does the basking shark eat?



Big fish



Small fish



Plankton
(tiny plants and animals)

Draw the shape of the shark's tail and consider how they move their body.



Sharks are cartilaginous fish, which means their skeletons are made of cartilage. The same material found in your nose and ears.

Seashore Postcard

Imagine you are one of the birds at the seashore on Skomer Island. Write a postcard to an animal in the woodland telling them what you have done today.

Dear

To: _____
The Woodland
National Museum
Cardiff

From

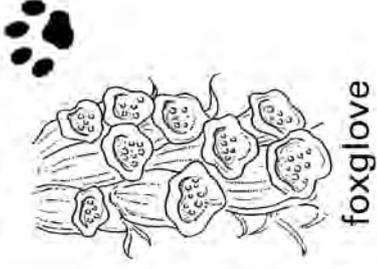
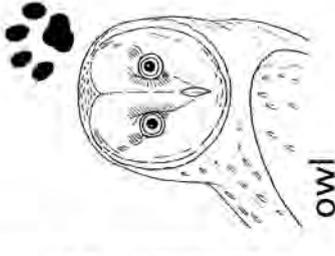
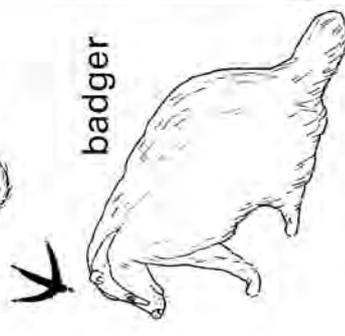
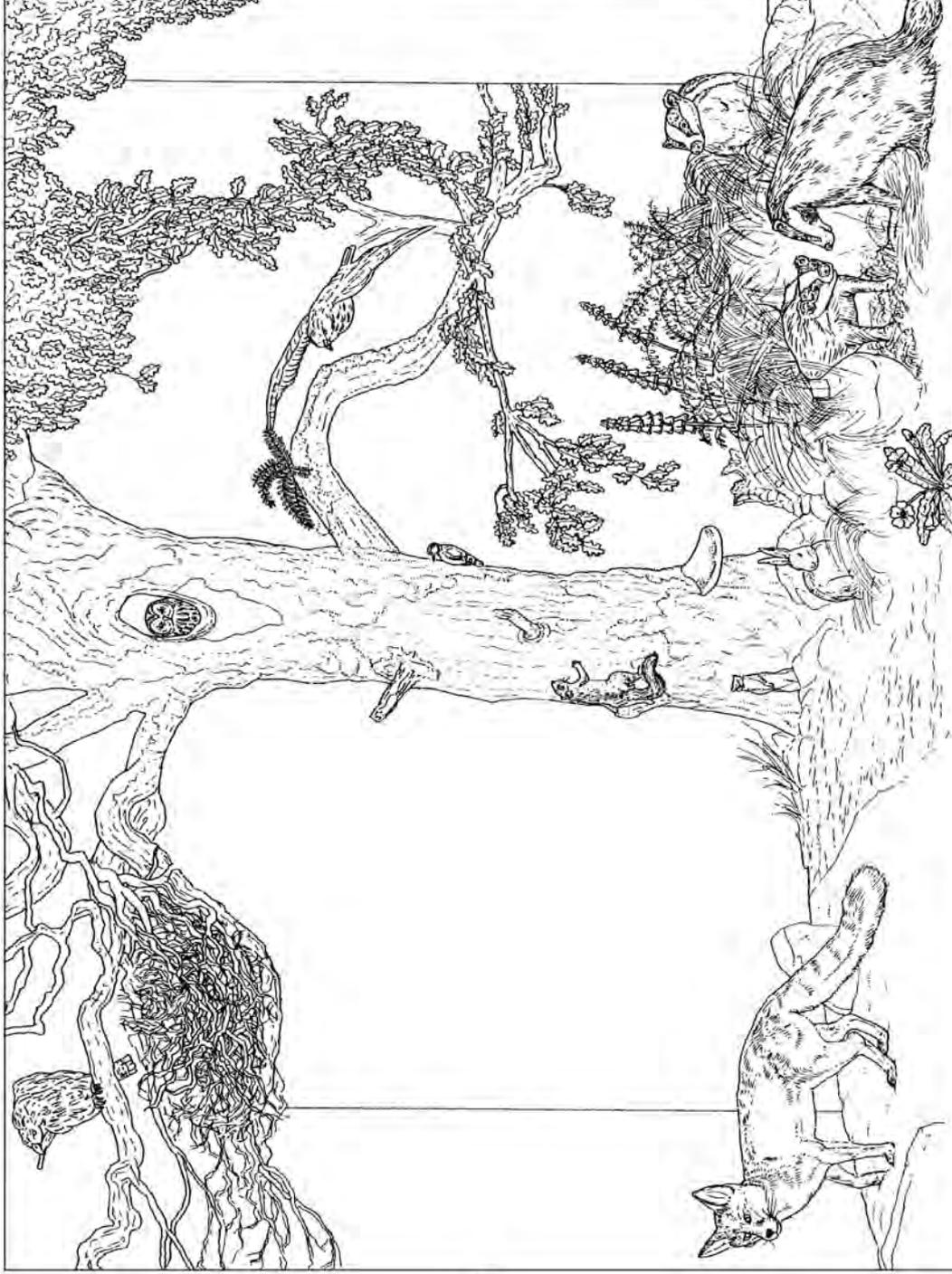


Think about...

Where have you been? What have you eaten? What sights have you seen?
Was it exciting? Scary? Fun? Who did you meet?

THE WOODS

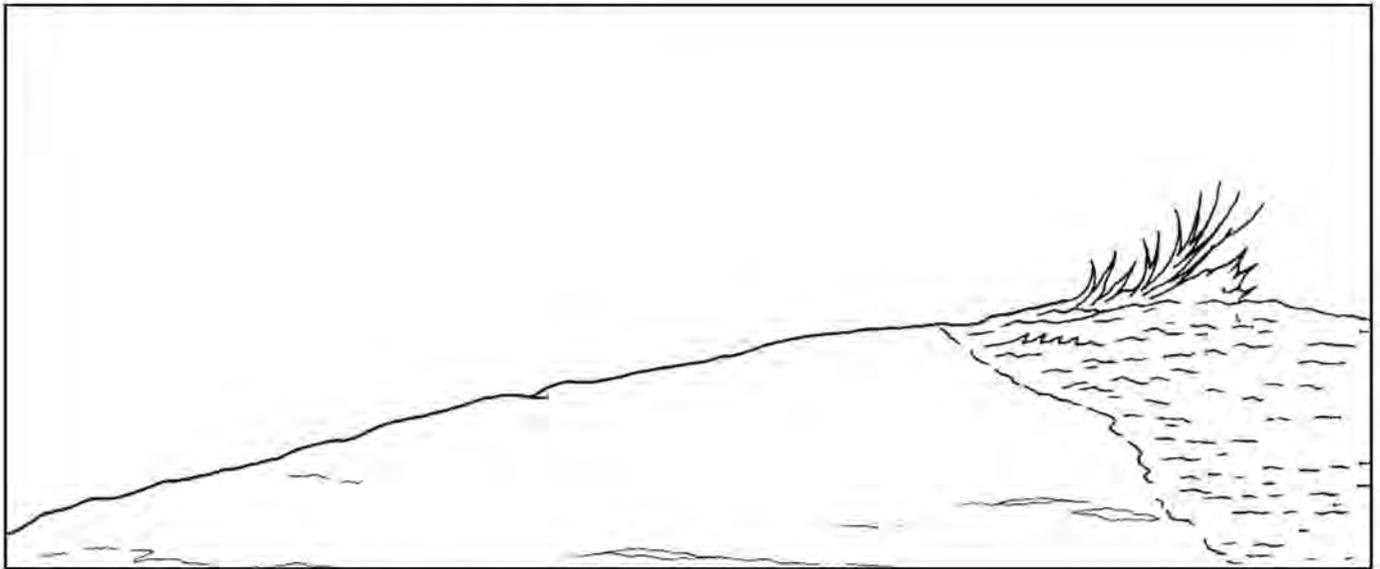
Match the plants and animals.



Winter Woodland Natural History Galleries

Find the woodland display in the Natural History Galleries.

Draw the fox on this woodland floor.



The fox is standing on snow. It is winter.

Draw what you and the fox will need to keep warm in winter.

How I keep warm

How the fox keeps warm

The fox has a home like a badger – its called a den.

Circle the words which describe how your home makes you feel?

safe

scared

happy

sad

warm

cold

Well done!

ANIMAL HOMES

Draw the animals

in or near their homes.



The owl in a hole in the tree.

The buzzard in its nest.

The badger near its sett.

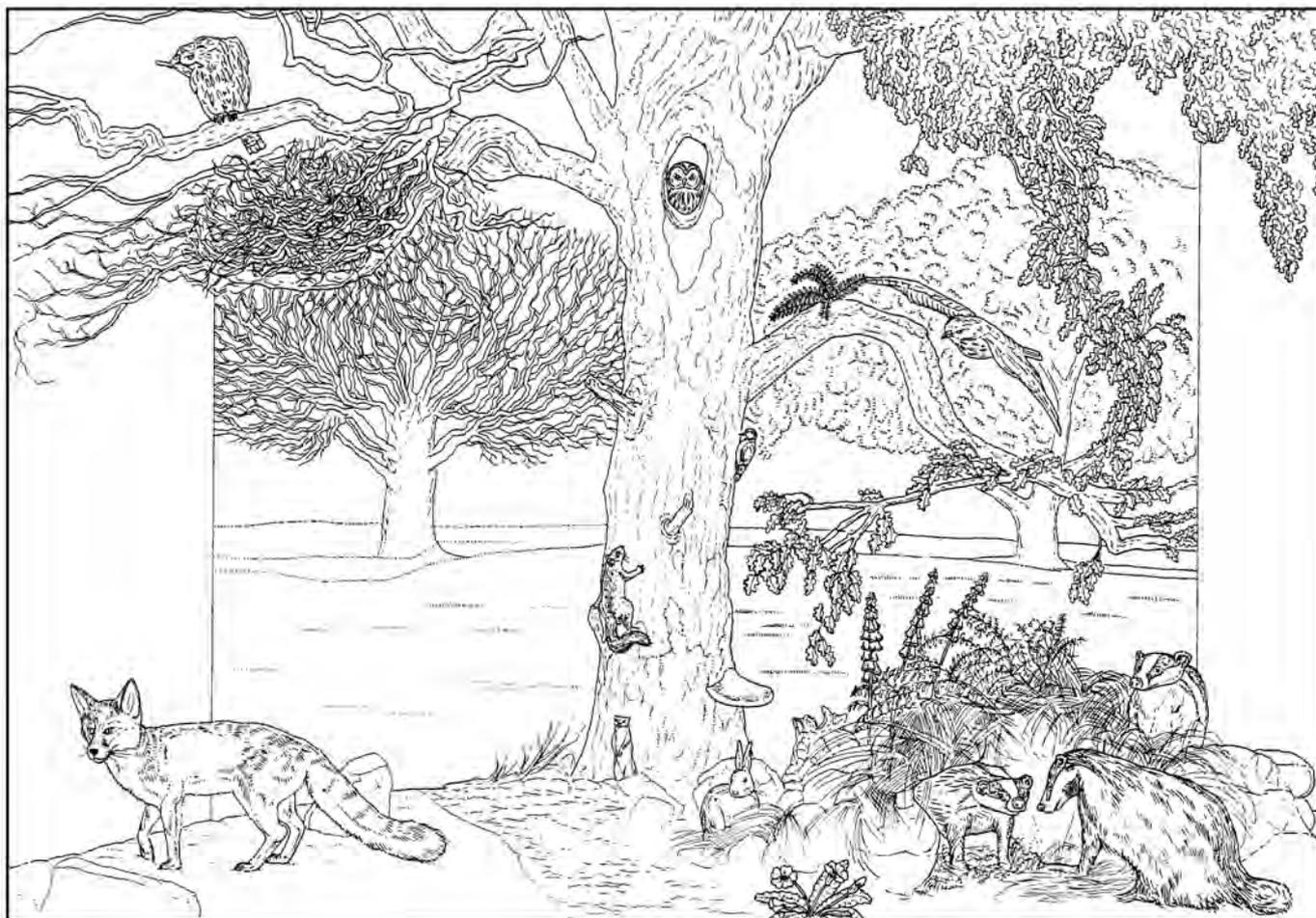
You outside your home.

Worksheet

THE OAK WOODLAND

The oak woodland shows an oak tree in a woodland in summer and in winter. At first, sit in a space where you can see the woodland. There are many animals and plants in, around and above the tree. Write the names of as many as you can see. You will need to move around to find all the information.

1. buzzard	2.	3.	4.	5.
------------	----	----	----	----



6.	7.	8.	9.	10.
----	----	----	----	-----

Close your eyes and listen very carefully. What can you hear?

Amazing Skeletons

Humpback Whale and Leatherback Turtle

Skeletons do an important job. They provide the body with support. Imagine what you would be like without a skeleton!

The Humpback Whale and Leatherback Turtle are Vertebrates. This means they have a backbone made up of vertebrae, like this:



You are a vertebrate too. Can you feel your vertebrae?

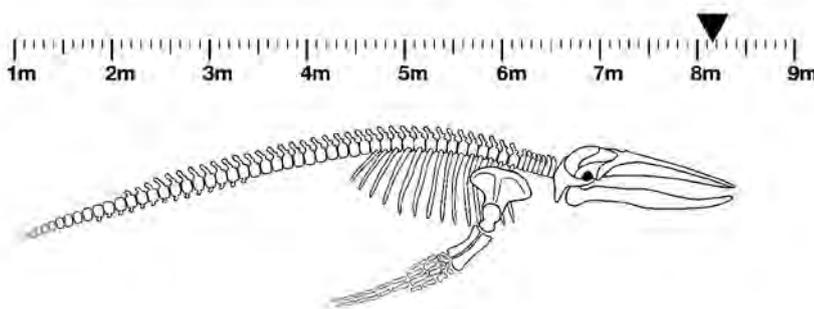
Count the number of vertebrae in the whale's spine. A human has 24. Does the whale have more, less or the same as you? circle

MORE

LESS

THE SAME

Imagine you are swimming alongside the Humpback Whale.



Draw yourself next to the skeleton. Are you bigger than the skull?

A fully grown Humpback can reach 19metres long – that is about the length of two buses!

Compare your hand to the Leatherback Turtle 'hand'.

Draw your hand here.

Draw the turtle's 'hand' here.

How is it the same?

How is it different?

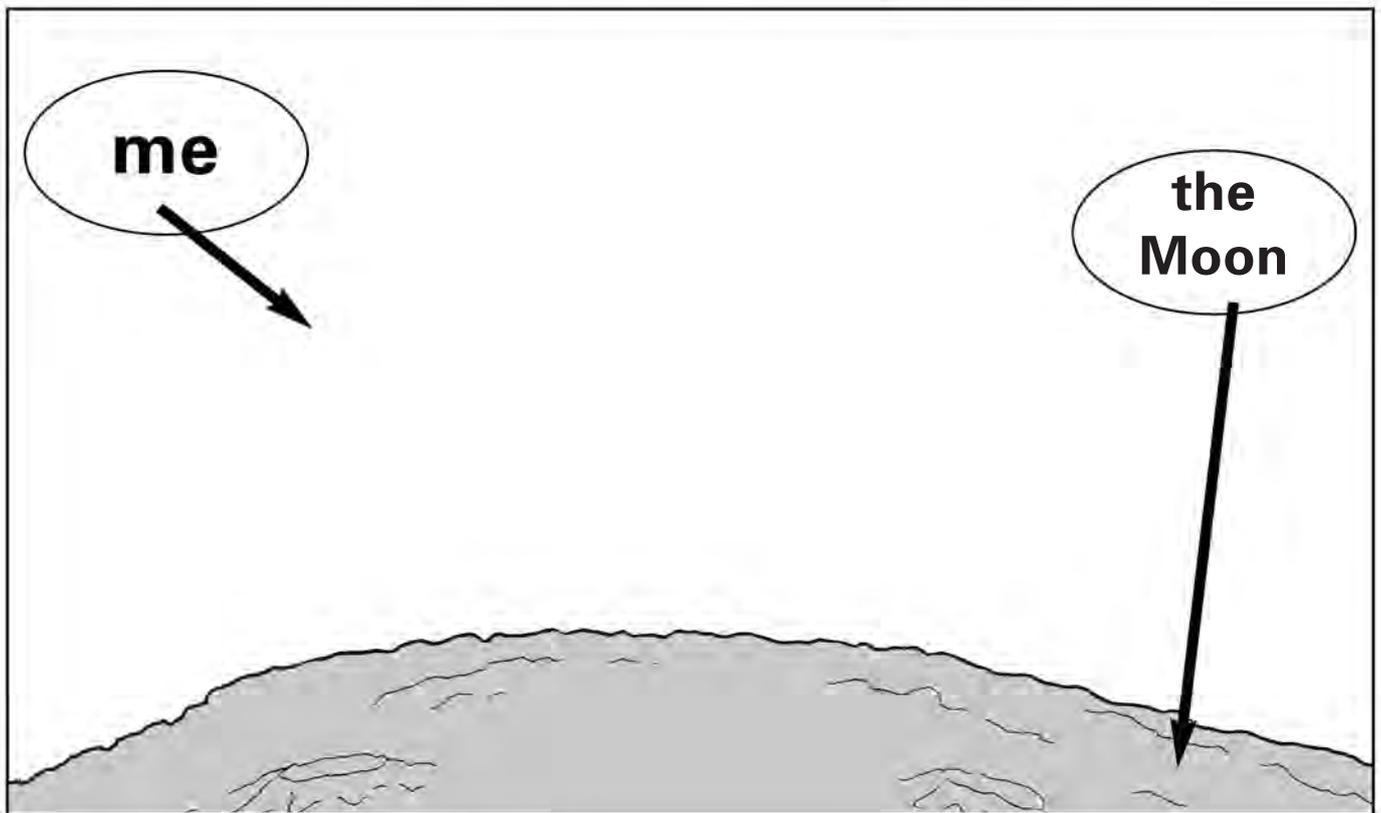
Fly me to the Moon!

Evolution of Wales Gallery

*Find the Moon rock as you walk out of the star video room.
It is very small.*

This rock was carried to Earth on a spaceship.

Draw a picture of yourself on the Moon collecting this rock.



Imagine you are the Moon rock.

How would you feel if someone picked you up?

Circle the words that describe how you would feel:

Scared

Excited

Afraid

Surprised

Angry

Upset

Happy

Bored

How would you feel if someone took you to a different planet?

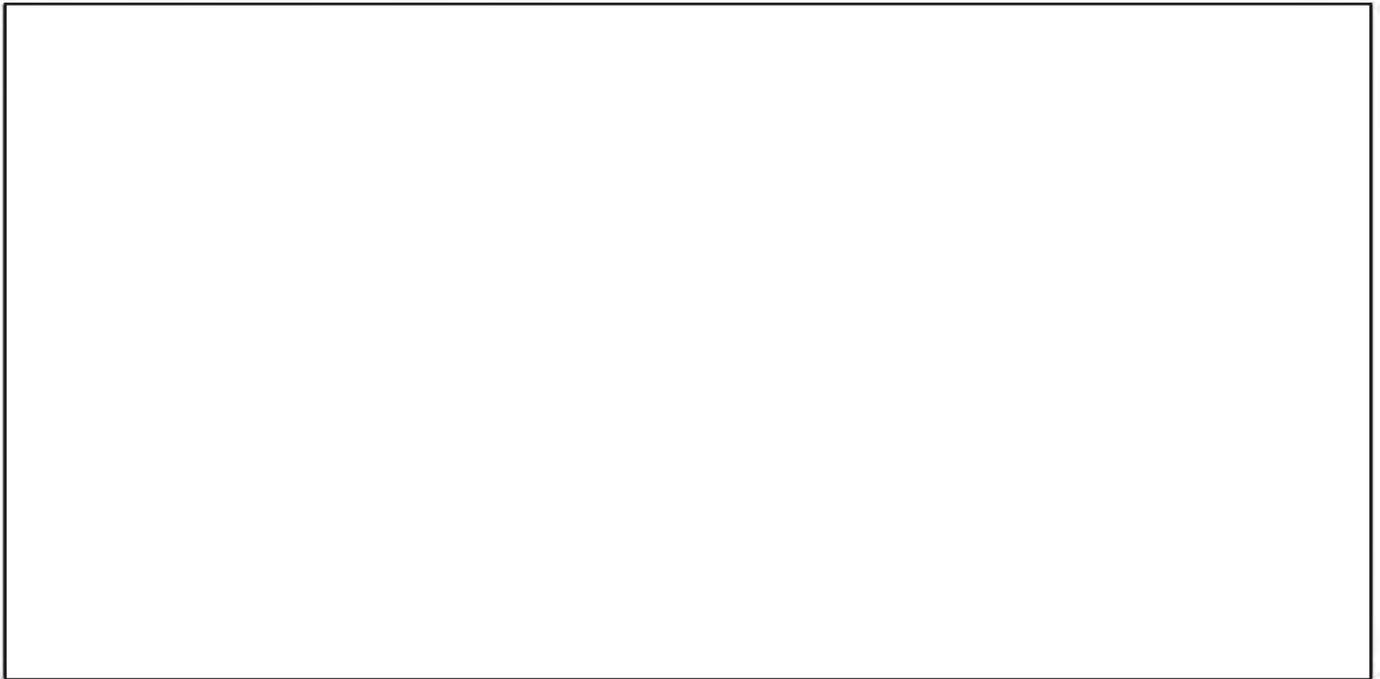
Good work!

Meteorites

Evolution of Wales Gallery

Find the meteorite as you walk out of the star video room.

Draw the meteorite in this box.



Touch it.

What does it feel like? Circle the words.

Cold

Warm

Smooth

Fluffy

Hard

Bumpy

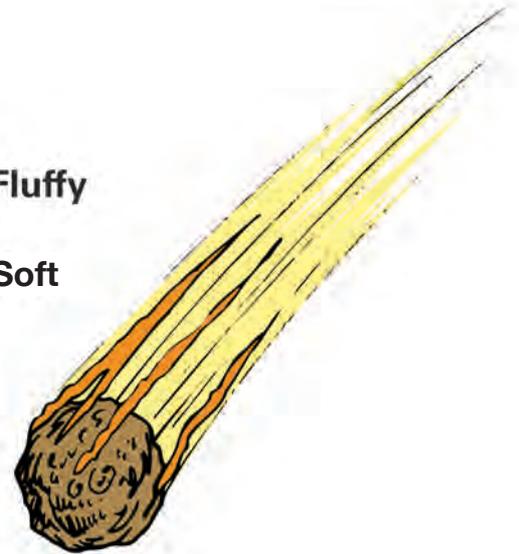
Rough

Soft

This rock came from Space!

It is the oldest thing you will ever touch.

Where was it found?



Good work!

Dinosaur Picnic

Evolution of Wales Gallery

Walk through the gallery until you reach the dinosaurs.

Draw the head of your favourite dinosaur here.

Don't forget to draw the teeth!



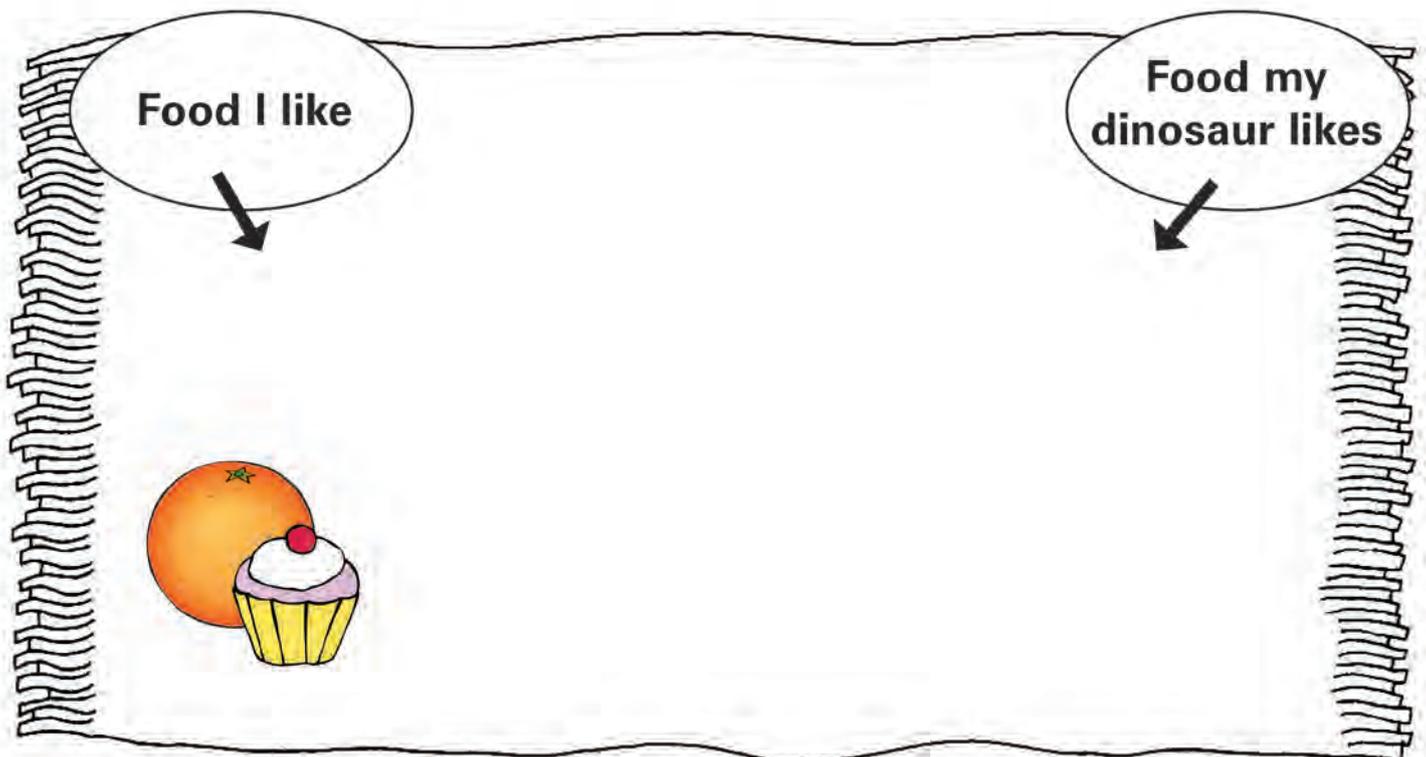
What type of food does your dinosaur like to eat?

meat

plants

(circle one)

If you were to have a picnic with your dinosaur, what would be on your blanket?



Volcanoes

Evolution of Wales Gallery

Walk through the gallery until you find the volcano.

Watch the video.

Circle the words you would use to describe the volcanoes.

Hot

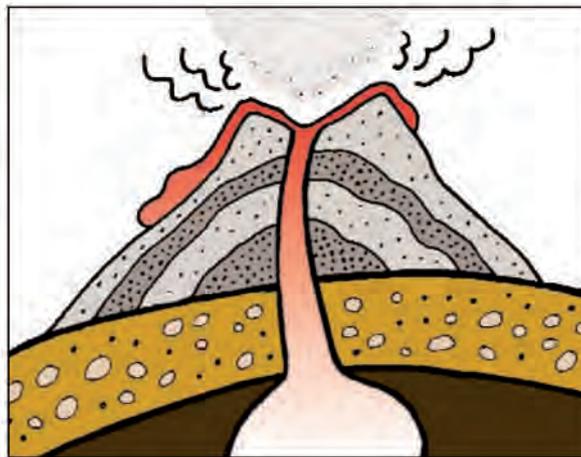
Explosive

Dangerous

Quiet

Violent

Label this diagram
of a volcano.



Hot lava

Lava rock

Steam

Have you ever heard of a volcano erupting in Wales?

YES

NO

Did we have volcanoes in Wales once?

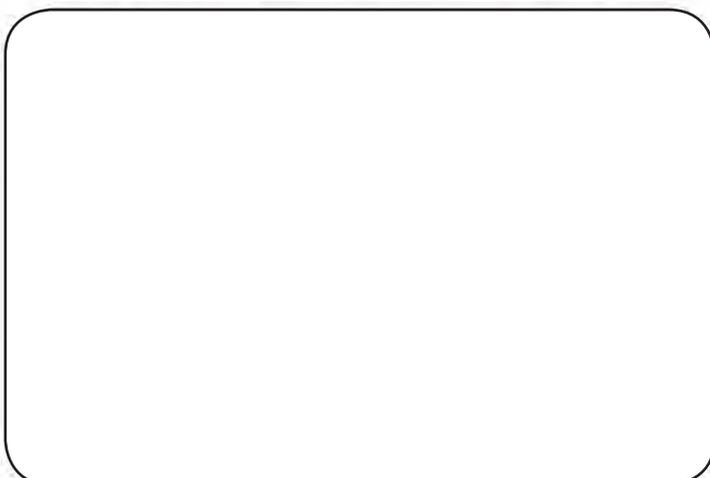
YES

NO

Underwater volcanoes grow under the sea to make islands. When the lava has cooled, the slopes of these volcanoes made a good **habitat** for corals.

Find the ancient coral reef.

Draw your favourite animal from the reef in this box.



Does this animal look like any
creature that is alive today?
Which one?

Dinosaurs

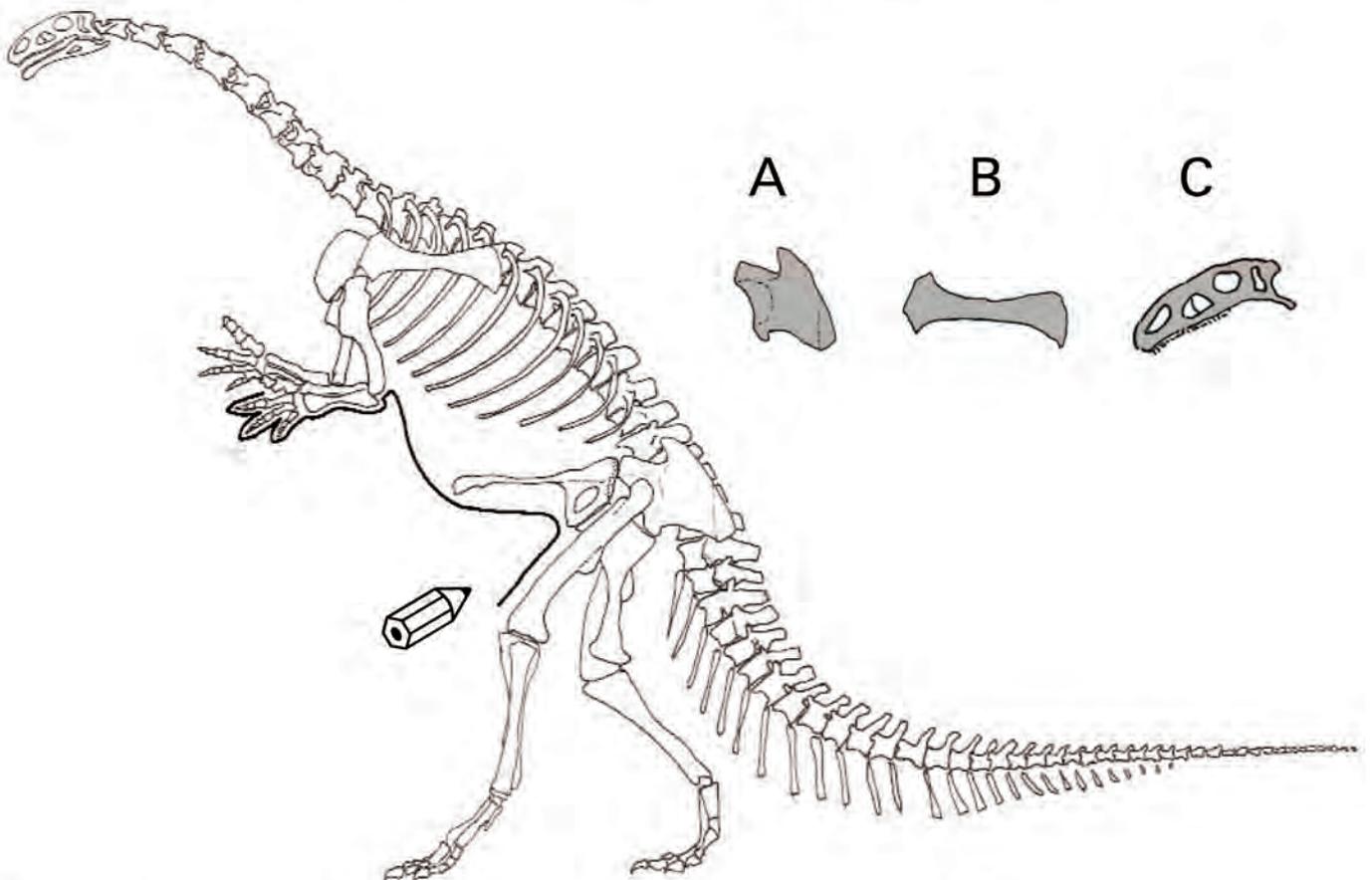
Evolution of Wales Gallery

Walk through the gallery until you find the dinosaurs.

Find the bones of a dinosaur called *Plateosaurus*.

Can you help our geologist? He needs to know where these bones belong on the dinosaur.

Match the bones he has found to where they go on the skeleton.



Our geologist would like to know what this dinosaur looked like, but he has only found its bones. Help him to find out by drawing the skin round the bones of this skeleton, and then colouring its body in.

This dinosaur lived in the desert. It needed to hide from predators.

What colour do you think it might have been?

Evolution of Wales – A journey through time

As you walk through the gallery complete the sentences below.

First I saw _____



Then I saw _____



After that I saw _____



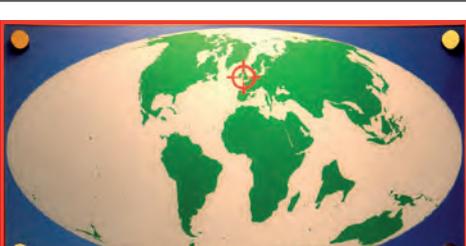
Finally I saw _____



Evolution of Wales – A journey through time



Located throughout the gallery are various 'Way Markers'. The red circles on the maps below show you the location of Wales on the Earth's surface at a given point in time. Correspond the map to the correct Way Marker, and complete the information in the table below.

Map	Number of million years ago	Climate	Information
			
			
			
			
			

Dinosaurs in Wales

220-65 million
years ago

Follow the sounds of the dinosaurs. Here you can see skeletons, models and footprints of dinosaurs found in Wales.

► Can you find all these dinosaurs in the gallery and in this wordsearch?



Dinosaurs:

Plateosaur

Megalosaur

Coelophysis

Apatosaur

Edmontosaur

T rex