

2.3 Geology and the Landscape

KS2 only



Learning Outcomes

After this activity programme pupils will understand how rock is formed, some of the processes involved and how these processes have helped form our landscape.

1. Make the rock sandwich of all time

Make a multi-layered sandwich to demonstrate the layers of rock that lie beneath our feet on the Heritage Coast. An example is shown below:

Start with bread and then a layer of salad leaves to represent the swampy forest vegetation that would become coal;

Another layer of bread to represent a change in time, then a layer of peanut butter because it's a bit like the colour of sand in the desert;

Another layer of bread covered in shrimp paste to represent the magnesian limestone in the Zechstein Sea;

Another layer of bread covered with chocolate spread with nut chips in to represent the boulder clay. Finish off with a layer of bread. Delicious!

Tell the story of the rocks, how and when they were made and make the sandwich as the story unfolds. Underline the fact that the oldest is at the bottom.

2. A demonstration of erosion and deposition

Fill an oblong washing up bowl with damp sand. Out of doors, turn it out upside down to form a sand castle type block. Using a hose pipe and working slowly from the outside edge to the middle allow the water to

erode the sand. You should end up with an eroded gully and an area of deposited sand downstream.

Build a model of your own imaginary dene.

3. Landscape detectives

Finding evidence of the rocks and process involved in the creation of the landscape.

Look at an Ordnance survey map of East Durham.

Identify the location of the denes

The extent of cliffs along the coast

The location of the round hills and raised land that made up the high points of the barrier reef

Visit Castle Eden Dene or Hawthorn Dene

(It is important you contact the site manager to book and discuss your visit. See contacts in the introduction.)

Look for the following plants that indicate the presence of a lime rich woodland soil so indicating the presence of magnesian limestone;

Ash

Yew

Dog's mercury

If you can get there look for the following plants in the grassland at Denemouth or in Hawthorn Meadow;

Common (Black) knapweed

Bird's foot trefoil

Find evidence of a gorge cut into the limestone by the enormous flow of water as the glaciers melted.

Collect a piece of limestone to look at it in class.

Is the stream bed dry? This often happens during dry spells as the magnesian limestone is porous and soaks up water.

Investigate the cliffs on the coast and find evidence of erosion by the sea and the presence of boulder clay. Look for pebbles on the beach that are not sedimentary. Could these be glacial erratics? Look for pebbles made up of a crystalline structure. These are igneous or metamorphic and so have been brought here by ice. Collect sea coal and sandstone pebbles to look at in class.

4. The Journey of a Speck

Children who drink the hard water from local sources, for example artesian wells, are themselves a direct link all the way back to the Zechstein Sea. The minerals such as calcium and fluoride being laid down in their teeth and bones started off in the magnesian limestone that was laid down in that sea over 250 million years ago. They are without knowing it a very real link to the rock they are standing on. The molecules ("specks" is a good way of describing these) now in their teeth and bones started on their most recent journey floating in the Zechstein Sea often as part of the organisms living in the plankton.

Write a story about the journey of one of the specks that make up your teeth. Where has it been and where is it going next?

5. A Frame in Time

Paint a series of time frame pictures for the class wall titled, "The changing view from Beacon Hill".

Time frame 1

When the hill was part of the barrier reef (Find out what animals lived in the Zechstein Sea)

Time frame 2

When the dinosaurs roamed past Beacon Hill

Time frame 3

When the ice ages came

Time frame 4

Just after the ice went - tundra, woolly mammoths, sabre-toothed tigers and Stone Age man

Time frame 5

The view east across the plains before the sea came

Time frame 6

The view east now

Time frame 7

A view of the hill now

Time frame - the future?