



Science Lesson Plan 4

SC4: Physical Processes

Focus:- (2) Forces and Motion

SC3: Materials and their Properties

Focus:- (2) Changing Materials & Investigating Colour

Aim: To see ochre in its natural surroundings and understand how this mixture of clay and minerals can be changed for industrial use.

Introduction:

- Explain the process of mining ochre and what it was used for.
- Using old photos from website, discuss how it was transported – along rails and by gravity.
- Effect on the landscape, wildlife and local people.

Resources:

- Virtual tour of the site.
- Photographic evidence of history of the site.
- History of local mining and quarrying activities and its effect on the local people.
- Geological maps and site maps.

What next?

- 1970 – work stopped and the works were demolished.
- What is derelict land and how can it be restored?
- Ochre was still being processed ‘within living memory’. By collecting memories and sayings from local people in the community and anecdotes from home we can begin to build a picture of the changes that have occurred.

Site Investigation Walking the Ochre Trail:

(**N.B.** Be aware that Red Ochre is a stain found on the site and is difficult to wash out of clothing)

- Look for changes in soil and rock colour and record anything special that you notice. Collect samples.
- Notice evidence of industrial activity and how it has affected the area you are in.
- Describe the site and its landscape.
- Look for evidence of how nature has reclaimed areas.
- Sketch the objects that have been placed at the site to help and inform visitors.
- Look for traces of Ochre around the trail, checking trees and plants and earth as you go.



Follow Up – In The Classroom

Gathering and presenting evidence:

- Produce a map of the Golden Valley Ochre Trail.
- Add sketches/photographs of the site now.
- Contrast with evidence of how it used to be using picture gallery references from the history collection.
- What kind of differences did you observe?

Analysing evidence and making decisions:

- Gather anecdotes from local families, home, newspapers, etc. to reinforce a view about how Golden Valley used to look.
- Talk to residents and Friends of Golden Valley to find out how much has changed since 1970.
- Think of other ways to increase the range of habitats available to plants and animals.
- Design your own poster/leaflet to encourage people from all mobility groups to follow and enjoy the Red Ochre Trail.

Investigating colour/colour change: *Changing materials (2 a,b,d,f,g)*

- e.g. using coloured chalks or powder paint in the red/orange/yellow/brown/white range.
- Mix and create earthy 'ochre' colours either by overlaying colour directly or grinding chalk and using water/P.V.A./oil to create a palette of shades when wet.

History:

- Research shades of paint made with Ochre such as 'Venetian Turkey' and 'Indian Reds' and attempt to replicate these tones. Be inventive!
- Keep records of your recipes to see if your friends can replicate your work.

Making work easier: (2) *Forces and Motion*

Ochre from the mines and trenches was hauled to the winding shed in drams along rails by ponies.

Challenge 1

- Using construction kits/junk materials construct an ochre transporter to transport 'n' gms of load up a fixed angle of slope?
- Find a way to measure the effort it takes.

Challenge 2

- The ochre was carried down to the ochre works by gravity.
- Construct a container to carry 'n' gms of ochre safely from the winding shed to the works one metre below in a steady descent.
- Can you identify the forces involved and measure them?