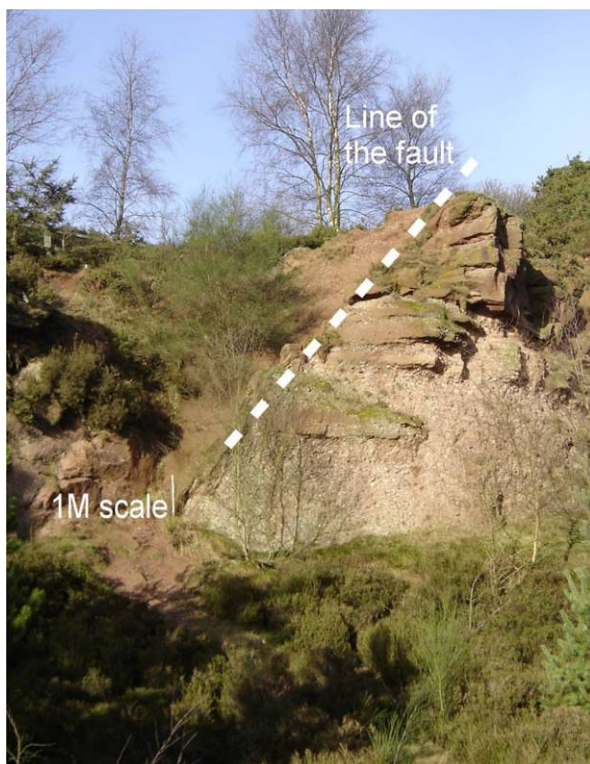


PARK HALL COUNTRY PARK: KS4 EARTH-SCIENCE ON-SITE EXERCISES

LOCALITY D: FOOTPATH ON THE WESTERN EDGE OF THE STONE CIRCLE

10 minutes


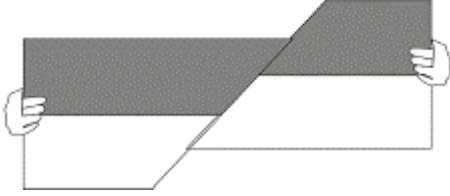


➡ Move the party to the edge of the stone circle, and stand on the track looking north towards the quarry face. **See Figure 1.** You may want to prepare a demonstration of faulting for use at this site.

Figure 1. The View North From Site D

Possible questions/tasks	Possible answers (words in brackets indicate need or opportunity for further teaching)
Q1 Observe the layering in the rocks in the quarry. How are the rocks similar to those seen at sites B & C?	Both sites show -Darker & lighter layers -Sandstone (darker) & conglomerate (lighter) layers -Layers tilted to the east
Q2 What is different about the beds at this location?	-The beds don't appear to be horizontal. (May need a prompt here - demonstrate again by holding up a tilted book & ask pupils to look at the appearance of the book from different directions) -Beds show different colours/are darker to the west/on the left hand side -Beds change appearance from left to right hand side of the face
Explain that the beds have been faulted. Point out the line of the fault.	The rocks have been faulted and sandstone layers to the left have been brought in contact with conglomerate & sandstone layers to the right.
Q3 Ask pupils to estimate the angle of tilt of the fault. N.B. The angle of tilt measured from the horizontal is usually called the angle of dip .	Fault tilted at 45°
Demo 1	Demonstrate faulting using a large piece of thin card with paper of two different colours stuck to its surface. (Darker colour represents a sandstone layer; lighter colour a conglomerate layer) Stand in front of quarry face & hold up the card to show the layering before faulting. Use a pair of scissors to cut the card at an angle of about 45 degrees.


PARK HALL COUNTRY PARK: KS4 EARTH-SCIENCE ON-SITE EXERCISES

	<p>Hold up the pieces of card side by side. Then slide the right hand card downwards to show how the layers moved when the rock was faulted. Point out how the conglomerate layer on one side no longer lines up with the other side.</p> <p style="text-align: center;">before the fault has formed</p>  <p style="text-align: center;">after the fault has formed</p> 
<p>Q4 Suggest what happened when the fault moved.</p>	<p>Land shook/earthquake took place</p>
<p>Explain that pupils are going to walk northwards to take a closer look at the face of the quarry. Point out that they will be looking for further evidence that a fault has cut through the sandstone and conglomerate layers.</p>	

PARK HALL COUNTRY PARK: KS4 EARTH-SCIENCE ON-SITE EXERCISES

LOCALITY E: QUARRY FACE, NORTH WEST MARGIN OF THE QUARRY

15 minutes

 Walk about 50 metres towards the fault in the quarry face. Stop on the track below the quarry face looking north.

Possible questions/tasks	Possible answers (words in brackets indicate need or opportunity for further teaching)
T1 Encourage pupils to find and put a hand on: the oldest bed, the fault plane, a bed that is tilted to the east.	(The beds are tilted at less than 10° to the east).
T2 Encourage students to identify which rocks were dropped down when the fault moved? (Evidence?) (May need a reminder and a run through of the faulting demonstration).	Block of rocks on the west were thrown down/dropped – based on evidence of rocks not matching up across the fault and the lack of thick pebble beds on the western side.
Q1 Can you suggest how this fault affected quarrying at Park Hall?	It dropped the pebble layers too far down to the west so it was difficult/too expensive to quarry to the west.
T3 Ask pupils to put hands on the rock in the quarry face on the left hand side of the fault. What do they notice about (a) the colour & feel of the rock (b) what the quarry face looks like?	(a) Darker red brown colour Feels slippery/damper/muddier/sticky (This damper material formed along the fault plane when the fault moved and ground up the rocks to form a rock flour/clay. This material is called a fault gouge). N.B. When the light is good more observant pupils may also mention scratch marks or grooves on the surfaces of sandstone blocks. These grooves were formed by the rocks grinding/scratching against each other as the fault moved. They are formed in the direction of relative movement along the fault. (b) Quarry face weathered more/worn back more. (The fault gouge is softer & is easily weathered).
Q2 Look at the pebbles in the lowest conglomerate bed. What is different about the pebbles in the lowest bed within 0.2m of the fault?	Pebbles parallel/line up with the direction of the fault
Q3 Can you suggest what has happened to these pebbles?	Pebbles dragged/moved in the same direction by the fault movements.
T4 Pupils asked to complete and label the field Sketch.	A completed worksheet for teacher reference is shown at the end of this document.