

© UKRIGS Education Project: Earth Science On-Site

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PUPIL WORKSHEET 1

Pupil Name

BUS QUIZ: from Forest Glen to Presthoke.

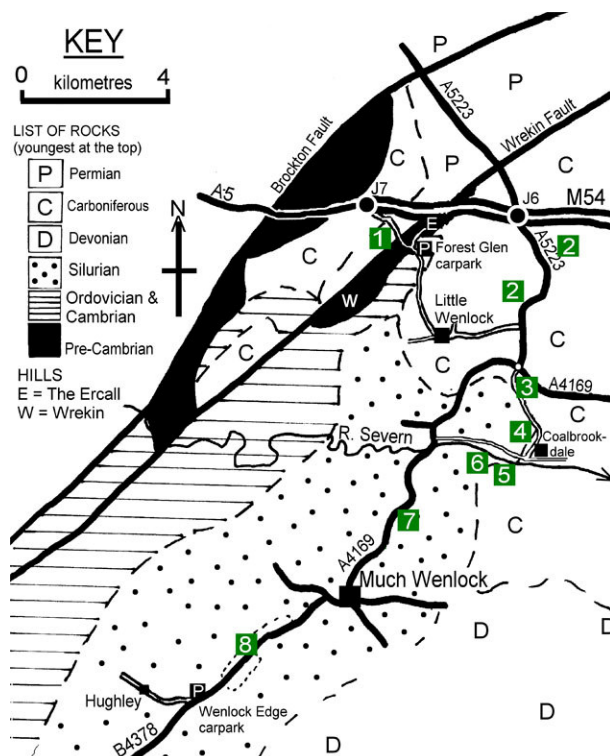
The answers are on the map, or outside of the bus window at the sites, numbered to match the question.

Q1: What is the name of the rounded hill behind and to the left, and what age rock underlies it?

A: The hill is _____ and the rock is _____ in age.

Q2: Areas here have been open-cast for which mineral? What sport is now played on them?

A: The mineral is _____ and the sport is _____



Q3: On the left the road is cut into sandstone. What age is it?

A: _____

Q4: From the places named outside of the window, what two minerals have been mined in this area?

A: _____ and _____

Q5: On the left is a power station. Why do you think it was built here?

A: _____

Q6: The steep valley was cut by glacial meltwater 10, 000 years ago. What river now flows through it?

A: _____

Q7: Circle the words below which best describe the rocks you can see in the road cutting on the left.

A: bedded / unbedded; horizontal / dipping; igneous; metamorphic; sedimentary.

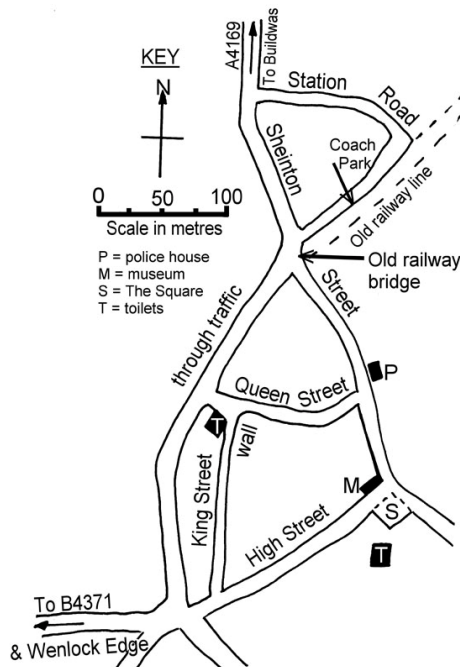
Q8: What kind of industry is to be found at this point?

A: _____

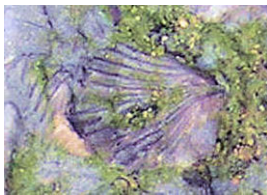
PUPIL WORKSHEET 2

Pupil Name

Much Wenlock Building Stones.



Colonial Coral



Brachiopod (shell fish)



Crinoid (broken pieces)

THE BRIDGE ABUTMENT.

Walk along Station Road and turn left into Sheinton Street. On the left is the bridge abutment.

1. In what year did the bridge building start ?

2. What stone was used to build the bridge?

3. What kind of weathering has affected the stone?

THE HOUSES ON SHIENTON STREET

(Circle your answers)

1. What has been used to make the roofs of these houses?

Tiles, slates

2. Circle the kinds of stones you can see in the walls of these houses.

Limestone, sandstone, gritstone.

3. Circle the stones used for the roof and walls of the **police station**.

Tiles, slates, Limestone, sandstone,

gritstone, blue bricks, red bricks.

STONE WALL, KING STREET

Use the photographs on the left to help you identify the fossils you can see in the **stone walls** (e.g. on King Street)

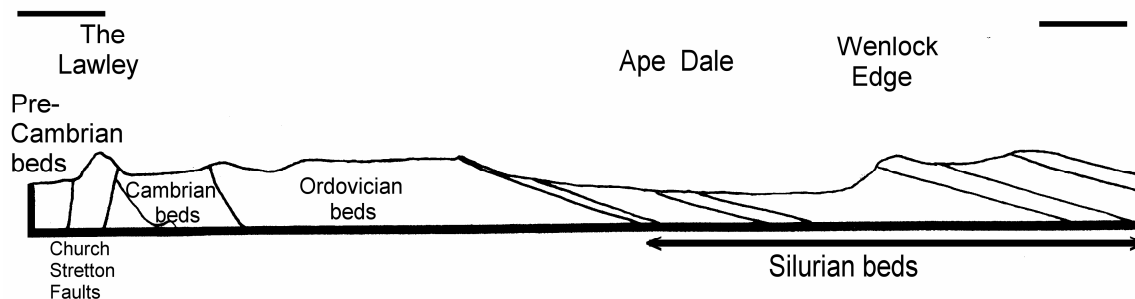
Tick off the ones you find

Colonial coral	
Crinoid pieces	
brachiopods	

PUPIL WORKSHEET 3

Pupil Name

Wenlock Edge: Landscape and Geology.



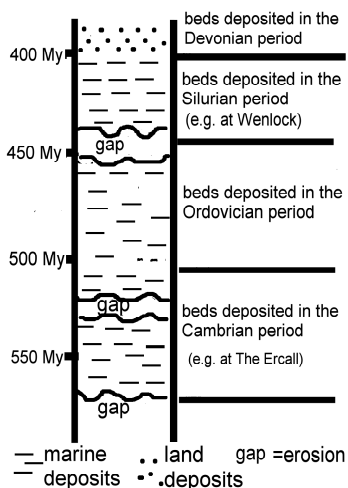
1. Draw an arrow above the section to show the direction in which the beds dip and mark with a vertical arrow, your position on the section.
2. Shade in the most resistant rocks on the section.
3. Mark on the section above the following features:

**West,
oldest bed,**

**East,
scarp slope**

**youngest bed,
dip slope**

4. Explain how the steep and gentle slopes of Wenlock Edge are caused by weathering and the dipping beds.



5. Using the geological column on the left to help you:

a) are the rocks at Wenlock older or younger than those at The Ercall?

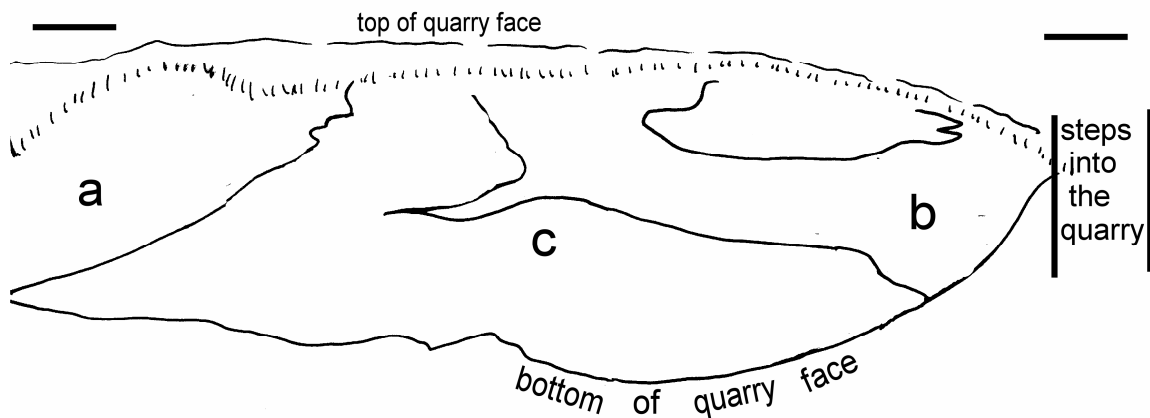
b) about how many millions of years is the time difference between them

c) what kind of deposits were laid down here in Shropshire during the 150 million years before the Devonian period?

PUPIL WORKSHEET 4

Pupil Name

Knowle Quarry (south).



1. Label the following features on the section.

West

East

Oldest reef

Youngest reef

2. Sketch in the bedding planes at points "a" and "b".
3. Describe the beds at points "a" and "b" in the table below.

At point "a"	Bed thickness:
	Horizontal / Dipping:
	Grain size:
	Fossil content:
At point "b"	Bed thickness:
	Horizontal / Dipping:
	Grain size:
	Fossil content:

4. On the sketch draw in the fault slickensides at point "c".
5. In what direction does the fault run?
6. Number these geological events in the order they occurred, number 1 first.
- Formation of calcite vein
 - Faulting
 - Deposition of limestone

PUPIL WORKSHEET 5

Pupil Name

Knowle Quarry (west).



1. On the sketch above, draw in the bedding planes and label the following features:

North

soil and vegetation

South

bedding planes

scree

joint plane

reef

Rock Cycle For Limestones.

2. Write the following letters on the diagram below to describe the rock cycle.
A, B and C are labels for the boxes. **D** and **E** are labels for the arrows.

A. Ions in solution

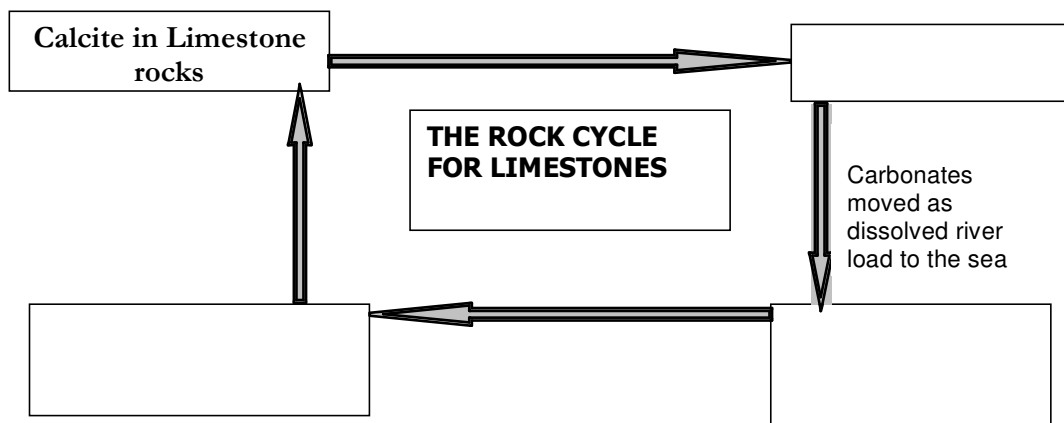
B. Calcite shells form new sedimentary rocks

C. CaCO_3 used in calcite shells of marine animals

D. Chemical weathering by acid rain

E. Animals dies leaving empty calcite shells.

F. Uplift of the crust exposes rocks to weathering.



PUPIL WORKSHEET 6

Pupil Name

Knowle Quarry Lime Kilns.



1. Complete the field sketch above by drawing in the missing kiln arches and buttress.
2. Draw in all of the areas which are made of red brick.
3. Explain why limestone blocks have not been used in these places.

4. On your sketch label the following 5 features

kiln arch
draw hole
buttress
areas of chemical weathering
areas of biological weathering

5. When in use the kiln was loaded with alternate layers of

_____ and _____

6. When limestone is "burnt" in a kiln it breaks down into a gas and a solid. Write the equation to show this.

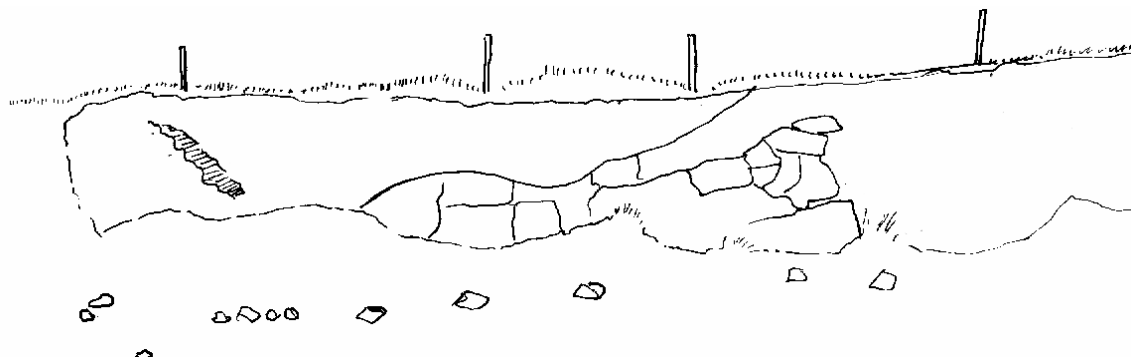


7. List as many uses of limestone as you can in the table below

PUPIL WORKSHEET 7

Pupil Name

Reefs On Jack Mytton Way



1. Draw in the bedding planes on the left hand side of the sketch and the joints on the right hand side.

2. Label on the sketch the following features:

**Bedded limestone & shale;
Scree slope;**

**"ballstone" reef;
Soil with grass and trees;**

**bedding;
joints.**

3. Comparing The Rocks At Wenlock With Those At the Ercall.

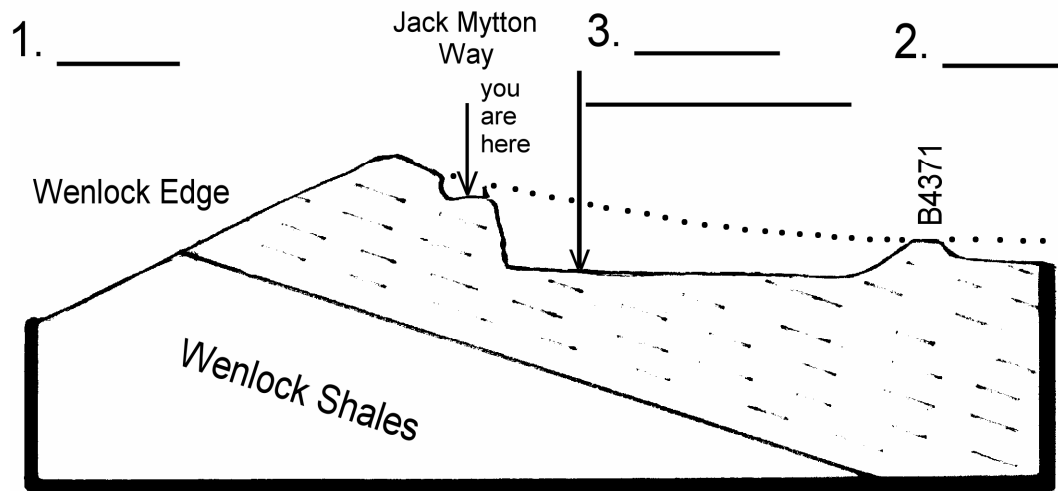
Fill in the table below with yes/ no answers.

	at Wenlock Edge	at The Ercall
An unconformity is present		
There are sandstones		
There are ripple marks		
There are shales		
There are limestones		
There are reefs		
There are very shallow water deposits		
There are slightly deeper water deposits		

PUPIL WORKSHEET 8

Pupil Name

Section Through Jack Mytton Way.

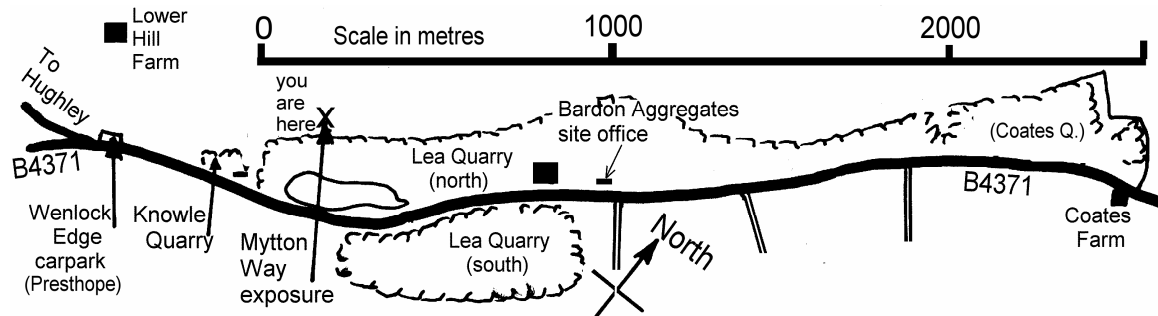


1. On the sketch section label the following features;
 - a) **Compass Directions** (at 1 & 2);
 - b) **the name of the Quarry** (at 3);
 - c) **the Wenlock Limestone;**
 - d) **and bedding planes.**
2. Shade in the area of limestone which has been quarried away.
3. Draw in an arrow on the section to show how the rainwater falling on the top of Wenlock Edge would drain away underground.
4. In places the quarry manager has placed a large amount of waste rock against the steep western wall of the quarry to protect the footpath. Can you explain why?

PUPIL WORKSHEET 9

Pupil Name

Lea Quarry (north).



1. Use the map to estimate the length and average width in metres, of the quarry from SE to NE (near Coates Farm).

LENGTH = _____ **AVE. WIDTH =** _____ **AVE. DEPTH = 10M**

2. Estimate the volume of rock removed from this one quarry.

L x W x D = _____ **cubic metres**

SOME OF THE HISTORY OF LEA QUARRY.

1841	Owned by a farmer who sometimes took stone from a small quarry hole.
1943	Owned by The Cross Company producing ground limestone for agriculture. Production: 200-300 tons per week. Employed 9 quarry workers.
1957	Owned by Ridge Limestone Company.
1961	Production was 1000 tons of lime and 3000 tons of stone per week. Employed 65 workers (but used little machinery).
1973 & 1974	Landslips occurred on the back wall of the quarry.
1988	Production was 700,000 tons per year [80% for aggregate; 10% crushed for concrete products; 8% agriculture; 2% fluxing stone for furnaces]. The quarry employed 20 quarrymen (and new machinery) with 100 lorries leaving the quarry every day. Quarry expansion obliterated the gatehouse and at least 1 cottage.
1992	Reduced demand for stone meant some quarrymen and senior staff were made redundant.
2000	Quarrying at Lea (north) had stopped.
2007	Quarrying at Lea (south) had stopped, leaving about 40 years reserves of limestone in the ground.

3. Using the information above on Lea Quarry make a list of the advantages and disadvantages of Lea Quarry to England and the people who live here.

Advantages	Disadvantages

4. What would affect your life most if we had to give up quarrying limestone?

Pupil Name

- A. Formation of volcanic rocks now exposed at The Ercall;
- B. Deposition of sandstones with ripple marks at The Ercall;
- C. Erosion of volcanic rocks now exposed at The Ercall;
- D. Period of uplift, and tilting 10^0 to the SE;
- E. Very long period of weathering when any younger rocks were eroded away;
- F. Present day weathering forming dip and scarp landscape;
- G. Quarrying of limestone begins more than 500 years ago;
- H. Deposition of reef limestones now exposed at Wenlock.