

© UKRIGS Education Project: Earth Science On-Site

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PUPIL WORKSHEET 1

Hypothesis 1: Did the type of stone being used to make monuments in this churchyard vary over time? (put a tick in the right box for each gravestone you investigate, then total them at the bottom).

	Sedimentary	Igneous	Metamorphic	Ceramic & Brick	Mixed (more than 1 material)
Before 1860					
1860 to 1910					
1911 to 1930					
1931 to 1950					
1951 to 1970					
1971 to 1990					
1991 to present day					
TOTALS					

Summary. According to your results:

Which rock type is most common overall? _____

During which period were sedimentary rocks more common?

During which time period were igneous rocks more common?

During which period were metamorphic rocks more common?

Can you suggest reasons why the type of stone in use might change?

PUPIL WORKSHEET 2

Hypothesis 2: Does amount of weathering that has occurred vary with the type of stone used?

Oldest / youngest rock type you can find	Earliest Date on the stone	Aspect (which way the stone is facing, i.e. N,E,S or W)	Extent of weathering: 0: smooth original surface. 1: pitted original surface. 2: lettering showing signs of being weathered. 3: lettering very hard to read. 4: Original surface completely destroyed.	Other variables: e.g. under trees, in shade of buildings or walls, amount of lichen on stone, porosity/permeability of the stone, etc.
Oldest sedimentary rock			Number	Notes
Youngest sedimentary rock			Number	Notes
Oldest Igneous Rock			Number	Notes
Youngest igneous Rock			Number	Notes
Oldest metamorphic rock			Number	Notes
Youngest metamorphic rock			Number	Notes
Oldest ceramic or brick			Number	Notes
Youngest ceramic or brick			Number	Notes

Summary. According to your results:

Which rock type shows most weathering? _____

Does the aspect (direction) seem to affect the amount of weathering? _____

Can you suggest an explanation of your results?

PUPIL WORKSHEET 3

Hypothesis 3: Does the rate of weathering of marble vary with the direction the marble surface is facing?

Find several monuments made from marble (ask your teacher to help do this) and use a tyre depth gauge to measure the amount of weathering between the front edge of the letters and the face of the marble stone. Do this for stones facing in different directions and record your results below. Then work out the rate of weathering in mm per year for stones facing in each direction.

Direction the stone faces.	Earliest date on stone.	Age of stone in years.	Depth of weathering in mm (using tyre gauge).	Calculation of the rate of weathering mm/year. [Depth in mm divided by age in years]
Facing north				
Facing east				
Facing south				
Facing west				

Task 2: Describing Rock Types:

**Find a stone made from a metamorphic rock and describe it below. Make sure you explain why you think it is a metamorphic rock.
THE NAME ON THE GRAVESTONE IS:**

ROCK DESCRIPTION:

IT IS A METAMORPHIC ROCK BECAUSE ...

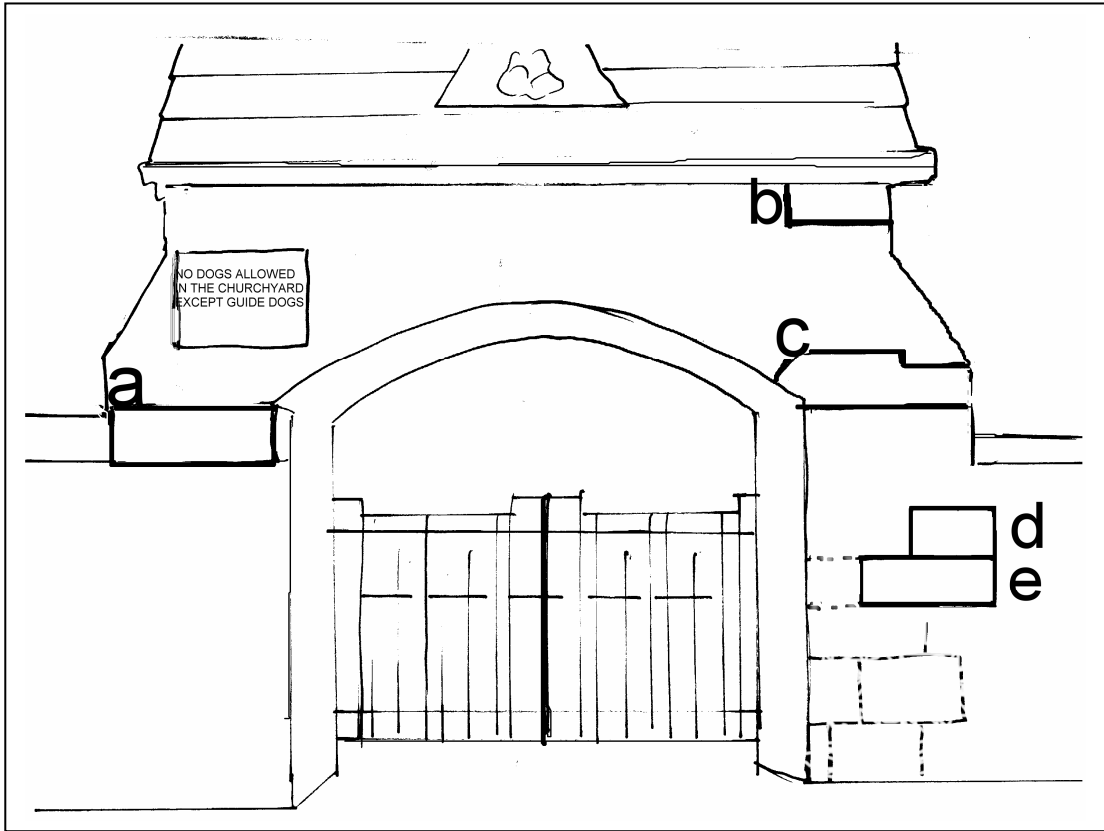
**Find a stone made from an igneous rock and describe it below. Make sure you explain why you think it is an igneous rock
THE NAME ON THE GRAVESTONE IS:**

ROCK DESCRIPTION:

IT IS AN IGNEOUS ROCK BECAUSE ...

PUPIL WORKSHEET 4

Task 3: A study of St Mark's Church Gate



1. Describe the rock used to build the gate house:

Grain / crystal size:

How the grains/crystals are held together:

Joints or bedding:

Rock Type:

Fossils:

2. Sketch in the bedding in blocks a, b, c, d and e

3. The blocks with bedding best described as flat bedding are:

a, b, c, d, e (circle the answers)

4. The blocks with bedding best described as cross bedding are:

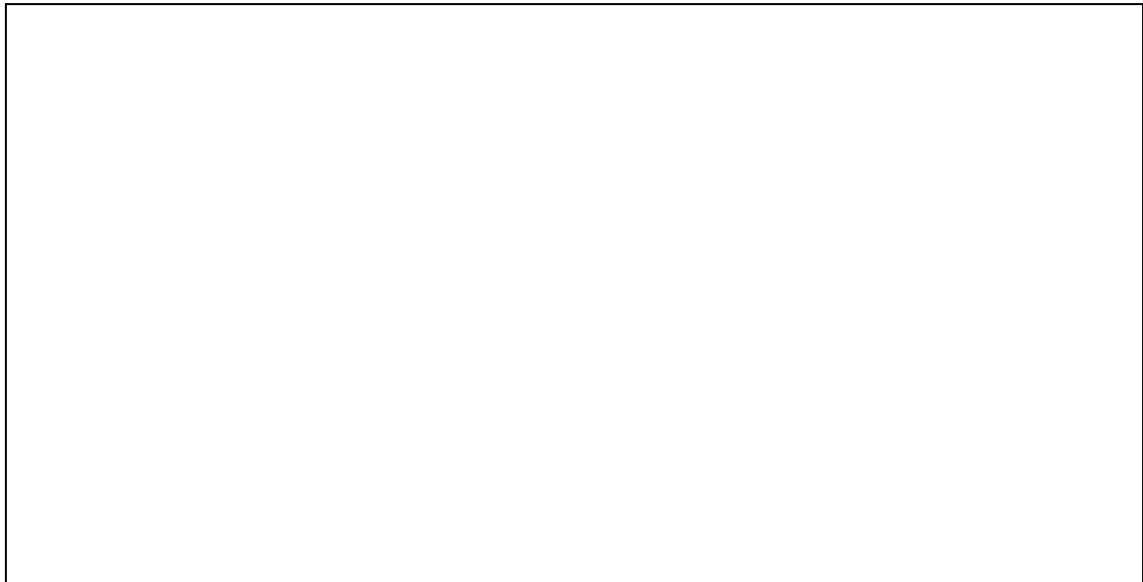
a, b, c, d, e (circle the answers)

Is block "a" upside down? Yes / No (circle the answer). Now give reasons for your answer

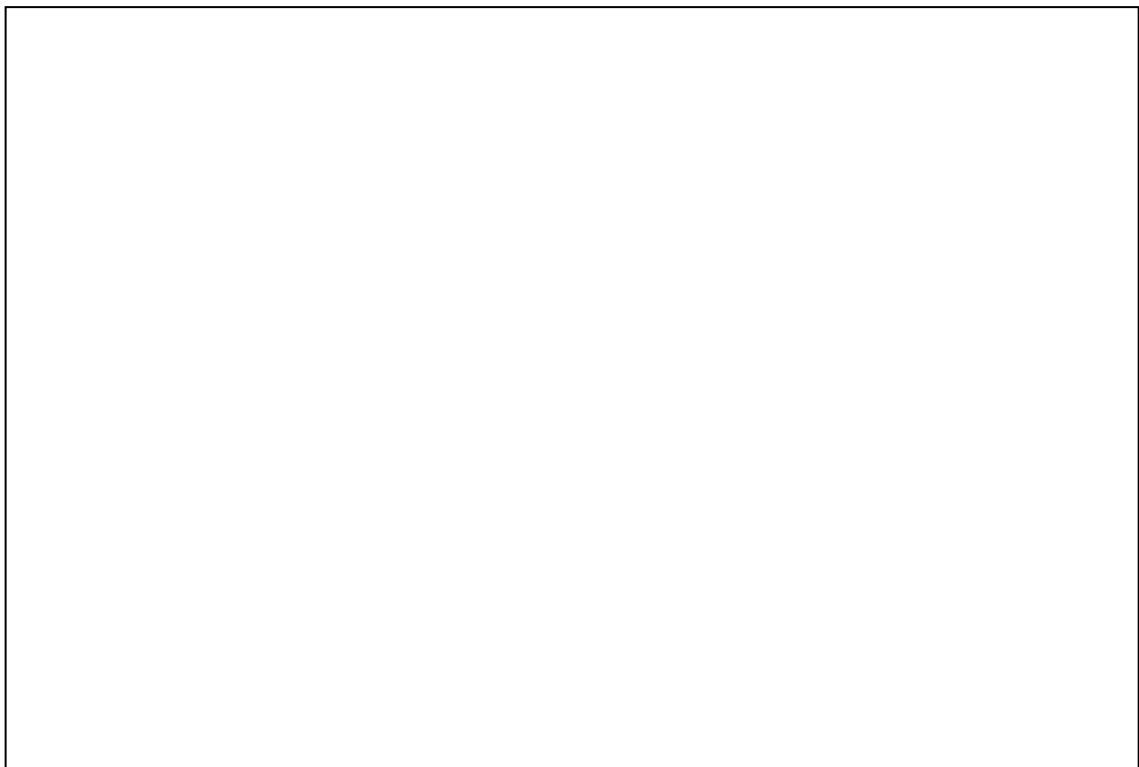
PUPIL WORKSHEET 5

Task 4: A Study of the weathering on St Mark's Church.

Sketch and label the main features of any evidence for weathering that you see on the front of the church. Would you say it is the same stone as used in the gate you have just studied Y / N ? (Circle your answer)



Study the square area just outside the entrance to the church. What is this area made of and why do you think this material has been used here?



PUPIL WORKSHEET 6

Task 5: A study of the vicarage wall.

Describe the northern part of the wall mentioning the kinds of material used, and the differences from the same wall further south.

Task 6: Investigating the rock in Barrow Hill Quarry.

What is the evidence that this rock is Igneous? (Use the headings to help)

Bedding:

Jointing:

Crystal size in mm:

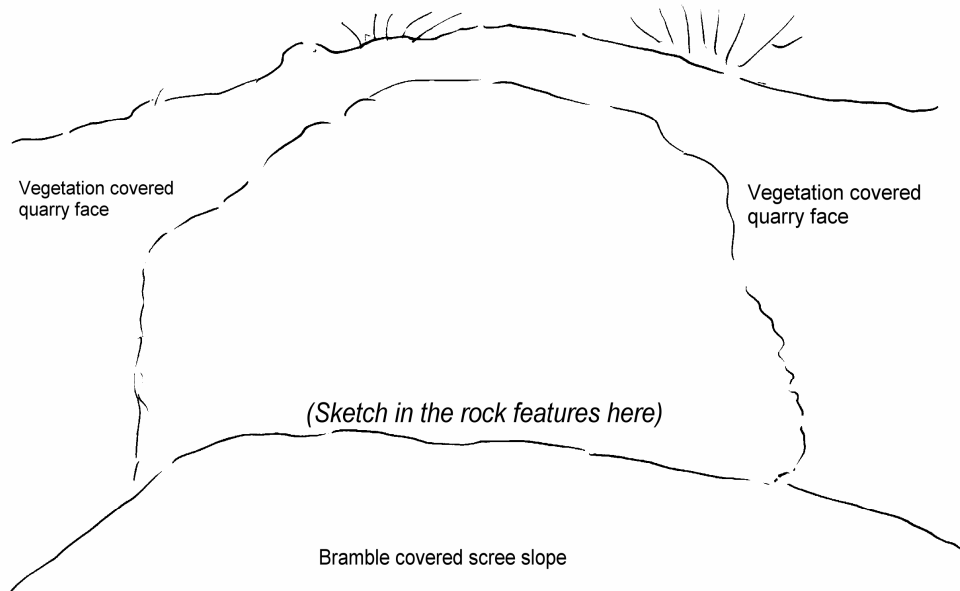
Porosity:

Metamorphism of other rocks:

What was the rock from this quarry used for?

PUPIL WORKSHEET 7

Task 7: A sketch of the west face of the quarry



What does the crystal size tell you about the speed of the cooling of the magma?

What do the hexagonal joints tell you about the cooling of the magma?

