



**PUPIL ACTIVITY SHEET 1**

Pupil Name .....

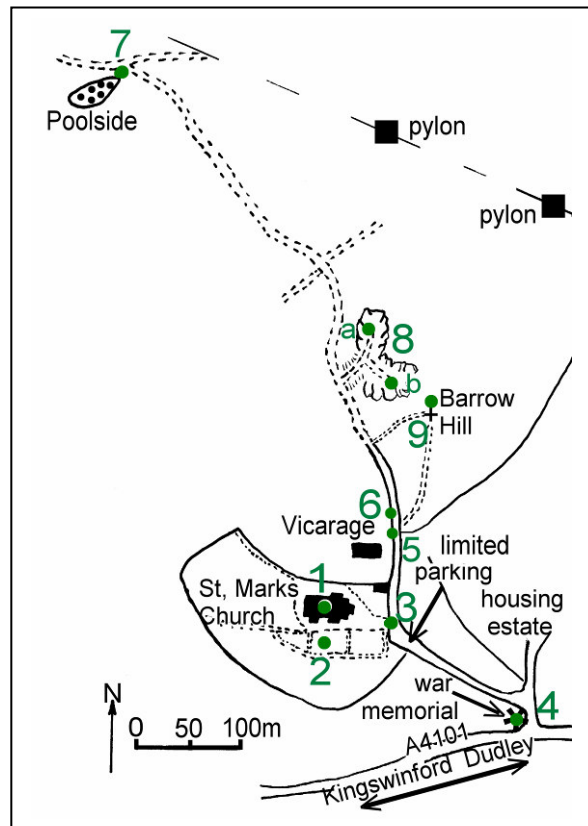
1. Use a compass to find North.
2. Mark North [or N] on the compass arrow in the bottom left corner of the map.
3. Find St Mark's Church. In which direction is the long side of the church?  
North to South, **or** East to West?

**EAST TO WEST**

4. What is the church path made from?

**TARMAC (BITUMEN AND STONE PIECES)**

At each later stop you will need to check and mark your map.



**Site 1a. A Study Of The Church.**

	THE CHURCH WALL	THE LOWER CHURCH ROOF	THE UPPER CHURCH ROOF
What is it made of?	<b>SANDSTONE</b>	<b>SLATE</b>	<b>TILES</b>
Is it porous?	<b>YES</b>	<b>NO</b>	<b>NO</b>
Does it have layers of grains cemented together?	<b>YES</b>	<b>NO</b>	<b>NO</b>
Does it split into thin sheets?	<b>NO</b>	<b>YES</b>	<b>NO</b>
Is it an igneous, sedimentary, metamorphic rock or man made?	<b>SEDIMENTARY</b>	<b>METAMORPHIC</b>	<b>MAN MADE</b>



PUPIL ACTIVITY SHEET 3

Pupil Name .....

**Rock Reference Sheet [alternative version]**

<b>Rock description</b>	<b>Type</b>	<b>Group</b>
Sand grains, grey/cream/red colour, layers.	Sandstone	Sedimentary
Large pinkish & white crystals.	Granite	Igneous
White sugary crystals, fizz with acid.	Marble	Metamorphic
Bands of crystals, different colours.	Gneiss [say it as "nice"]	Metamorphic
Small crystals mostly dark green/black.	Dolerite	Igneous
Large crystals, mostly dark green/black.	Gabbro	Igneous
Creamy/white lime mud & shells, layered.	Limestone	Sedimentary
Splits into layers, dark grey/purple/green.	Slate	Metamorphic
May be hard, rough, smooth or shaped.	Brick, tile, concrete	Man made!!

PUPIL ACTIVITY SHEET 4

Pupil Name .....

**Site 2: Churchyard Recording Sheet (1)**

<b>Head Stone</b>	<b>Earliest Date</b>	<b>Rock Name and Rock Group</b>	<b>Evidence Of Weathering</b>
<b>1</b>		<b>Rock name:</b> (Circle the answer)  <b>Igneous,</b>  <b>Metamorphic,</b>  <b>Sedimentary.</b>	<b>Caused by weather:</b>   <b>Caused by plants:</b>
<b>2</b>		<b>Rock name:</b> (Circle the answer)  <b>Igneous,</b>  <b>Metamorphic,</b>  <b>Sedimentary.</b>	<b>Caused by weather:</b>   <b>Caused by plants:</b>
<b>3</b>		<b>Rock name:</b> (Circle the answer)  <b>Igneous,</b>  <b>Metamorphic,</b>  <b>Sedimentary.</b>	<b>Caused by weather:</b>   <b>Caused by plants:</b>
<b>4</b>		<b>Rock name:</b> (Circle the answer)  <b>Igneous,</b>  <b>Metamorphic,</b>  <b>Sedimentary.</b>	<b>Caused by weather:</b>   <b>Caused by plants:</b>
<b>5</b>		<b>Rock name:</b> (Circle the answer)  <b>Igneous,</b>  <b>Metamorphic,</b>  <b>Sedimentary.</b>	<b>Caused by weather:</b>   <b>Caused by plants:</b>

PUPIL ACTIVITY SHEET 5

Pupil Name .....

**Site 2: Churchyard Recording Sheet (2)**

<b>Head Stone</b>	<b>Earliest Date</b>	<b>Rock Name and Rock Group</b>	<b>Evidence Of Weathering</b>
<b>6</b>		<b>Rock name:</b> (Circle the answer)  <b>Igneous,</b>  <b>Metamorphic,</b>  <b>Sedimentary.</b>	<b>Caused by weather:</b>   <b>Caused by plants:</b>
<b>7</b>		<b>Rock name:</b> (Circle the answer)  <b>Igneous,</b>  <b>Metamorphic,</b>  <b>Sedimentary.</b>	<b>Caused by weather:</b>   <b>Caused by plants:</b>
<b>8</b>		<b>Rock name:</b> (Circle the answer)  <b>Igneous,</b>  <b>Metamorphic,</b>  <b>Sedimentary.</b>	<b>Caused by weather:</b>   <b>Caused by plants:</b>
<b>9</b>		<b>Rock name:</b> (Circle the answer)  <b>Igneous,</b>  <b>Metamorphic,</b>  <b>Sedimentary.</b>	<b>Caused by weather:</b>   <b>Caused by plants:</b>
<b>10</b>		<b>Rock name:</b> (Circle the answer)  <b>Igneous,</b>  <b>Metamorphic,</b>  <b>Sedimentary.</b>	<b>Caused by weather:</b>   <b>Caused by plants:</b>

PUPIL ACTIVITY SHEET 6

Pupil Name .....

**Site 2. What will make my gravestone last longer?**

Over-hanging trees cause gravestones to weather because

**THEY KEEP THE STONE WET BY DRIPPING WATER AND SHADING FROM THE DRYING EFFECT OF THE SUN.**

Limestone or Marble gravestones don't last long because

**THEY REACT WITH ACID RAIN AND DISSOLVE AWAY.**



Porous sandstones don't last long because

**THEY LET THE WATER INSIDE AND ATTACK THE ROCK.**

Old gravestones are weathered most because

**THEY HAVE BEEN UNDER ATTACK BY THE WEATHER FOR LONGER.**

Igneous grave stones last longer than sedimentary ones because

**THEY ARE MADE OF INTERLOCKING CRYSTALS AND ARE NOT POROUS. THE MINERALS ARE MORE RESISTANT TO WEATHERING**

Polished igneous gravestones last longer than rough ones because

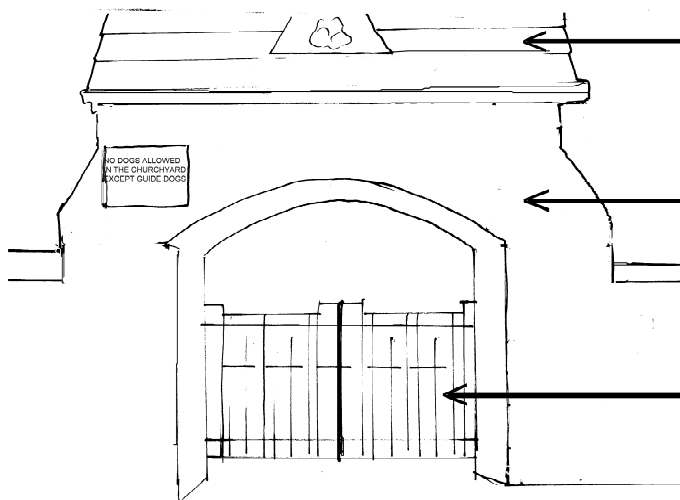
**THE POLISHED SURFACE ALLOWS THE WATER TO DRAIN OFF MORE QUICKLY.**

PUPIL ACTIVITY SHEET 7

Pupil Name .....

**Site 3. St Mark's Church Gate**

Look closely at the materials used to build the church gate and wall



The roof is made of  
**FLAT** shaped stones.

The wall is made of  
**BLOCK** shaped stones.

The gate has been painted to protect it from  
**WEATHERING**.

Write one of the following words in the spaces to the right of the sketch describing the gate:

**FLAT**

**BLOCK**

**WEATHERING.**

	<b>Church Gate</b>	<b>War Memorial</b>
<b>What colour is the stone?</b>	<b>grey</b>	<b>grey</b>
<b>How big are the grains in the stone?</b>	<b>1mm</b>	<b>1mm to 2mm</b>
<b>Does the rock contain fossils?</b>	<b>No</b>	<b>Yes</b>
<b>What is the name of this rock?</b>	<b>Sandstone</b>	<b>Limestone</b>
<b>Is the stone igneous, metamorphic or sedimentary?</b>	<b>Sedimentary</b>	<b>Sedimentary</b>
<b>What signs of weathering of the stone can you see?</b>	<b>Grains loosened by the weather rub off from the stones.</b>	<b>Grains rub off. The fossils stand up because the rest of the rock has been weathered away.</b>

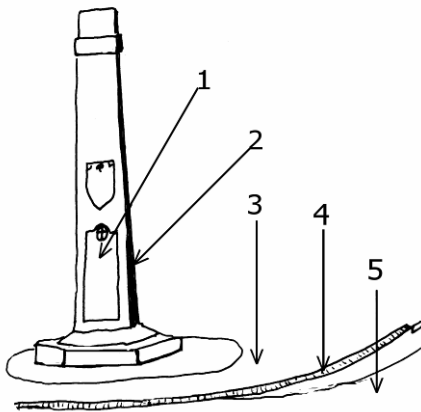


**PUPIL ACTIVITY SHEET 8**

Pupil Name .....

**Site 4. The War Memorial.**

Study the rock that the memorial (rock 2 in the sketch) is made from and describe it in the table below.



Is it made up of grains cemented together?	<b>YES</b>
Does it have fossils in it?	<b>YES</b>
Does it react with dilute acid (ask your teacher to do the test)	<b>YES</b>
What kind of rock is this?	<b>LIMESTONE (SEDIMENTARY)</b>

Look carefully at the 5 numbered parts of the memorial site. In the table below write what they are made of in the first column. Use the words listed below

**bricks and cement      limestone      soil      tarmac      metal**

In the last column write down where each of these materials comes from.

<b>Number</b>	<b>... is made of ...</b>	<b>... which comes from ...</b>
<b>1</b>	<b>METAL</b>	<b>Ores dug from the ground.</b>
<b>2</b>	<b>LIMESTONE</b>	<b>Quarries in the ground.</b>
<b>3</b>	<b>SOIL</b>	<b>Weathered from rocks in the ground.</b>
<b>4</b>	<b>BRICKS &amp; CEMENT</b>	<b>Bricks from fired clay. Cement is made from limestone and clay, quarried from the ground.</b>
<b>5</b>	<b>TARMAC</b>	<b>Bitumen coating from oil wells in the ground, and rock chippings.</b>

**PUPIL ACTIVITY SHEET 9**

Pupil Name .....

**Site 5. The Vicarage Wall**

Look closely at the materials used to build the vicarage wall.

<b>Questions</b>	<b>Answers</b>
Describe the shape and size of most of the materials used to build the wall here.	<b>Irregular, 10 – 20 cm, uneven, rough, need plenty of mortar.</b>
Find a rock made of grains of sand. What is its colour and rock type?	<b>Creamy. Sandstone.</b>
Find a hard rock made of small crystals. You may see smaller bits all over the place. What is its colour and rock type?	<b>Dark/black. Dolerite.</b>
Find a hard glassy material that is not a natural rock. It is waste slag from an iron furnace. What else can you see in it?	<b>Full of holes/bubbles.</b>
Why do you think these materials were used in the wall here, away from the church?	<b>Using waste or recycled materials reduces the cost of building. There was no need to use expensive dressed stone beyond the church.</b>

**Site 6. The Upper Wall, [beyond the stile]**

Find the wall! What is it covered with?	<b>Overgrown by trees, roots growing through it. Moss and other plants. Soil.</b>
Describe the materials used to build this wall.	<b>Irregular shapes, 10-20 cm, glassy with holes/bubbles. No clear sign of mortar holding it together [chunks have fallen out].</b>
This hard glassy material is not a natural rock. It is waste from an iron furnace. What is it called?	<b>slag</b>
Which wall is older – this one, or the one by the church? Why do think this?	<b>This upper one. Tumbled down, more overgrown. This was probably a pre-turnpike coaching road, built before the church &amp; this is the original wall.</b>
Why do you think these materials were used for this wall?	<b>Locally available from iron furnaces – recycling waste!</b>
Keep a look out for other materials in the wall. Write down any that you find.	<b>Pieces of brick, ironstone &amp; limestone [used in iron furnaces]. The whole hill has been used as a dumping ground for centuries.</b>

PUPIL ACTIVITY SHEET 10

Pupil Name .....

**Site 7 Poolside**

Look at the soil along the path and around the poolside.

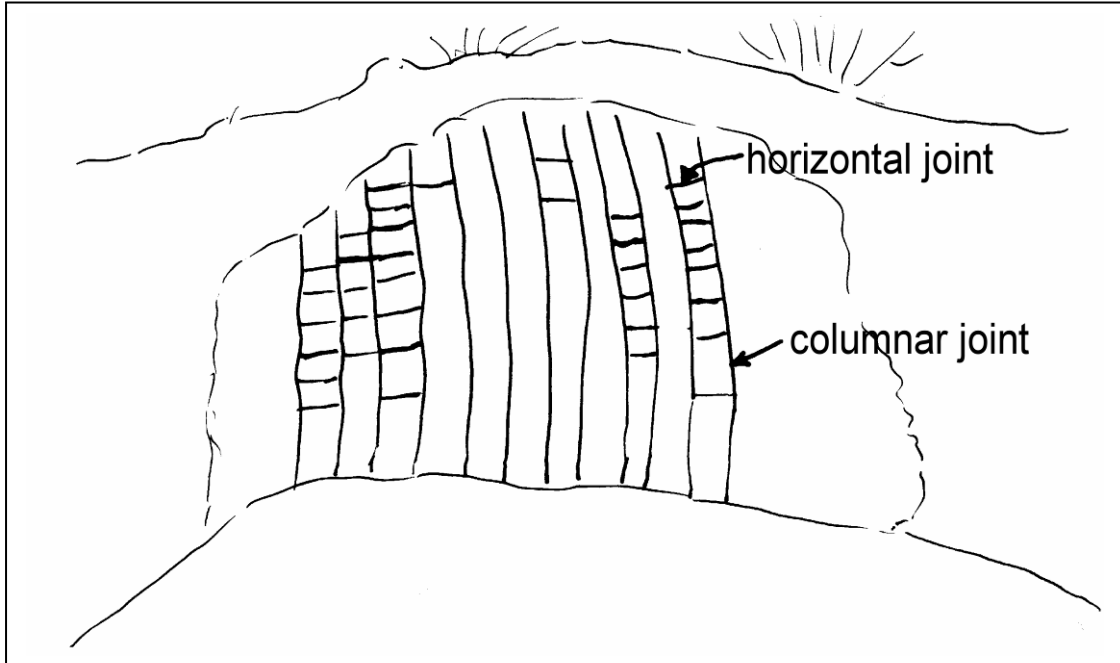
Describe the soil found here. (for example what is the colour, grain size, hardness / softness, fossils, bedding etc.)	<b>Red, fine grained clay, no bedding or fossils are visible. It is red because it is weathered from red marl below.</b>
Try to explain why the soil here is wet. You might have looked at soils in school.	<b>It has been rained on! Clay holds moisture – dry clay is porous, it absorbs water and swells to fill the pores, so wet clay is not porous.</b>
Why is there a pool of water here on this rock?	<b>Water does not soak away through clay &amp; this is a low point in the field.</b>
There were several clay pits in the area, like Tansey Green, to the west. This clayey sedimentary rock is known as Etruria Marl. What was this clay used to make?	<b>Bricks &amp; tiles [some seen around the churchyard &amp; in local area]. Research topic- see follow-up notes.</b>
What plants can you identify here, most of which thrive in wet conditions?	<b>Moss, rushes, buttercups etc.</b>

PUPIL ACTIVITY SHEET 11

Pupil Name .....

**Site 8a. Barrow Hill Quarries North.**

On the sketch below draw in the joints you can see in the rock face.



Look at any small piece of the rock lying on the scree slope and answer the questions below.

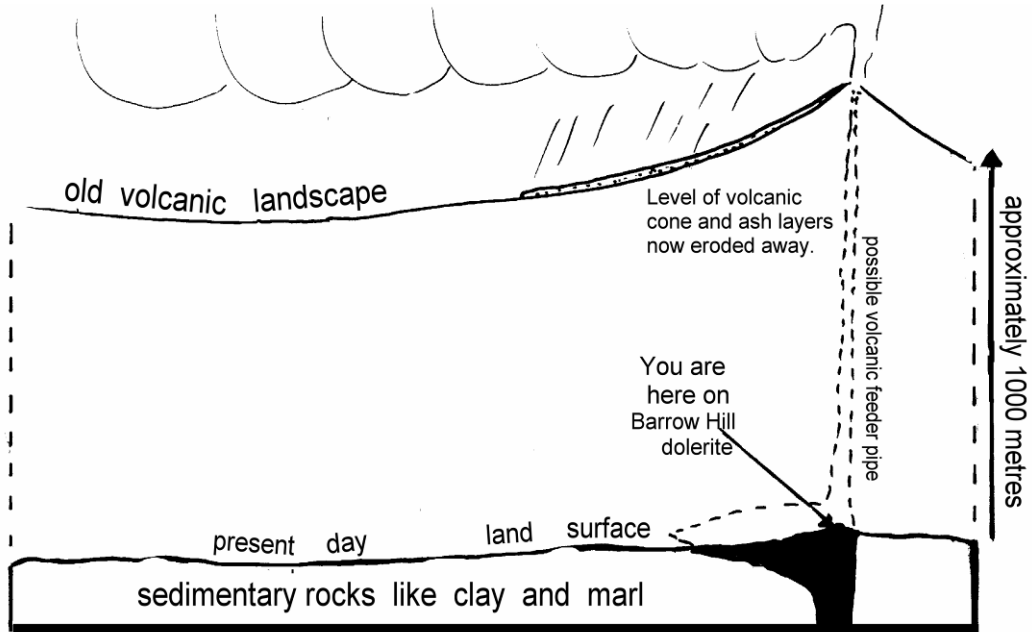
Is the rock dark or pale in colour?	<b>DARK</b>
Is the rock layered?	<b>NO</b>
Is it porous? Does it react with acid?	<b>NO NO</b>
Is it made of interlocking crystals?	<b>YES</b>
About how big are the crystals?	<b>ABOUT 1mm</b>
Look at the Rock Reference Sheet and write down the rock type.	<b>DOLERITE</b>
Can you see any evidence that this rock is being weathered?	<b>LUMPS OF FALLEN ROCK. BROWN STAINS (RUSTY) OF WEATHERED IRON.</b>

PUPIL ACTIVITY SHEET 12

Pupil Name .....

**Site 9. Barrow Hill Summit Viewpoint.**

This is a sketch section through the ground at Barrow Hill. It is not to scale.



**SW**

**NE**

Explain why you can no longer see the volcano.	<b>IT HAS BEEN WEATHERED AND ERODED AWAY.</b>
Explain why the igneous rock dolerite forms Barrow Hill today, whilst the marl forms lower ground.	<b>THE DOLERITE IS HARDER TO WEATHER AND ERODE AWAY THAN THE SOFTER MARL.</b>
Make a list of the things made from the marl and clay in this area that you have seen today.	<b>BRICKS, TILES, ROOF DECORATIONS, MOULDED GRAVESIDE TRIMS ETC.</b>
Make a list of the things you have seen (or heard about) that have been made from the dolerite.	<b>ROADSTONE, WALLS.</b>
What parts of the housing estate and hospital that you can see from Barrow Hill, have NOT come from the ground?	<b>NOTHING.</b>