

Rock around your school

Investigating the building materials around your school and in your area

Use your own school and local area to introduce your pupils to the wide range of materials used to make buildings. First visit the sites and plan your trip.

Divide the pupils into groups and supply each group with table 1 and 2 (like those shown below), clipboard, paper and pencils.

Ask the pupils to fill in Table 1 with as many materials as they can see. The teacher will need to be on hand to answer queries.

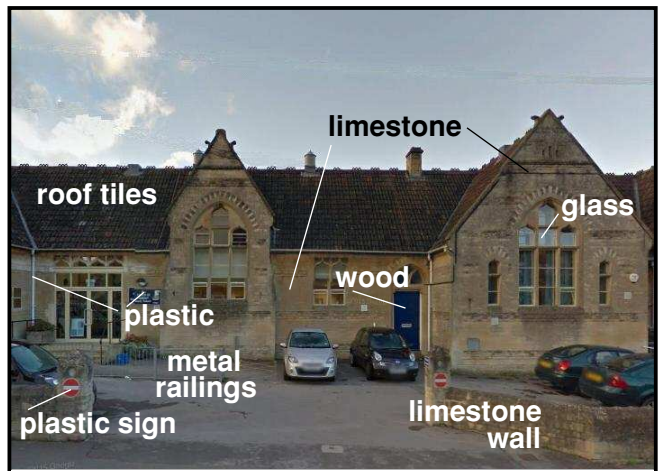
Provide the pupils with the key on page 3 and ask them to look at some of the natural materials more carefully. They should fill in Table 2. Even in a school where everything appears to be made of manufactured materials, it is often possible to find some examples of natural rocks.

Thirdly, ask the pupils to carry out a similar exercise on their way home from school. If they travel by car, ask them to do the exercise at home or with their parents or guardians.

Carry out the following:-

- Find eight different natural stones used for building, or for facing stones, or in pathways or rockeries, or for gravestones or fireplaces (not including those you have already seen in the school!).
- For each of these, fill in a second copy of Table 2

The teacher could try to discover the geology of the area surrounding the school. In the UK, this is fairly easy as geological maps of the whole of the UK are freely available online from the British Geological Survey's Opensegeoscience website <http://www.bgs.ac.uk/opensegeoscience/>. Also, pupils enjoy using the free apps for smart 'phones or tablets - iGeology and iGeology 3D. iGeology will tell them what the rock is beneath their feet and iGeology 3D will tell them the geology of nearby hills or mountains.



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(Elizabeth Devon)

TABLE 1: Materials used in the buildings and in their surroundings (natural and manufactured)

Type of material	Where I saw it being used	Natural or manufactured?	If manufactured, did the original material come from the ground?
e.g. glass	classroom windows	manufactured	yes

TABLE 2: Natural materials used in the buildings and their surroundings

Natural materials	Where I saw it being used	What it is used for	Type of rock	Clues to tell me rock type	Is it standing up to the weather well?	Is this a good use for this rock?	Do you like it?

The back up:

Title: Rock around your school

Subtitle: Investigating the building materials around the school and in the area

Topic: This activity can be used in science or geography lessons. It illustrates Earth science principles out of doors, often without a natural rock in sight, and engages pupils in discussions about Earth processes and products.

Age range of pupils: 8 - 18 years

Time needed to complete activity: 30 minutes around the school grounds

Pupil learning outcomes: Pupils can:

- distinguish between natural and manufactured materials;
- follow a branching key;
- use the criteria by which rocks are distinguished;
- identify a wide range of rock types;
- realise that all building materials whether natural or manufactured come from the ground;
- avoid the temptation to make a sample fit the key if it is inappropriate;

Context:

Pupils are encouraged to distinguish between manufactured and natural materials. They discuss the origins of all these materials.

Following up the activity:

Pupils could try some of the following Earthlearningideas <http://www.earthlearningidea.com>:

- Earth science out of doors: preserving the evidence
- Rocks from the big screen
- Building stones 1 - general resource
- Will my gravestone last?
- Building stones 2 - Igneous rocks
- Building stones 3 - Sedimentary rocks
- Building stones 4 - Metamorphic rocks
- What was it like to be there - in the rocky world?
- Fieldwork: Applying 'the present is the key to the past'.

Underlying principles:

- In simple terms, sedimentary rocks are mainly non-crystalline and consist of fragments or grains compressed and cemented together. Metamorphic and igneous rocks are largely formed of interlocking crystals and so are impermeable. In igneous rocks the crystals usually show random alignment, but in metamorphic rocks they are often aligned. Some metamorphic rocks which do not

show alignment e.g. marble, are usually made of one mineral but impurities sometimes show streaky patterns.

- Rocks containing carbonate minerals, i.e. marble and limestones, will react with dilute hydrochloric acid. (This should only be done with permission, although it leaves very little sign on the stone - and gravestones are sometimes cleaned using acid).
- Igneous and most metamorphic rocks are more impermeable than most sedimentary rocks. They resist weathering better and are more capable of taking a polish on the displayed surface.
- Igneous and metamorphic rocks are often attractive in themselves, owing to the range of colours of their constituent minerals.
- The overall colour of an igneous or metamorphic rock is often controlled by small amounts of trace elements in the minerals. In a sedimentary rock, the composition of the (natural) cement which binds the grains together usually influences the colour of the rock.

Thinking skill development:

By using a key, pupils are involved in thought processes of construction. The fact that rocks such as granite may occur in many different colours may involve cognitive conflict. Working out of doors provides a good opportunity to make a bridge with normal classroom studies.

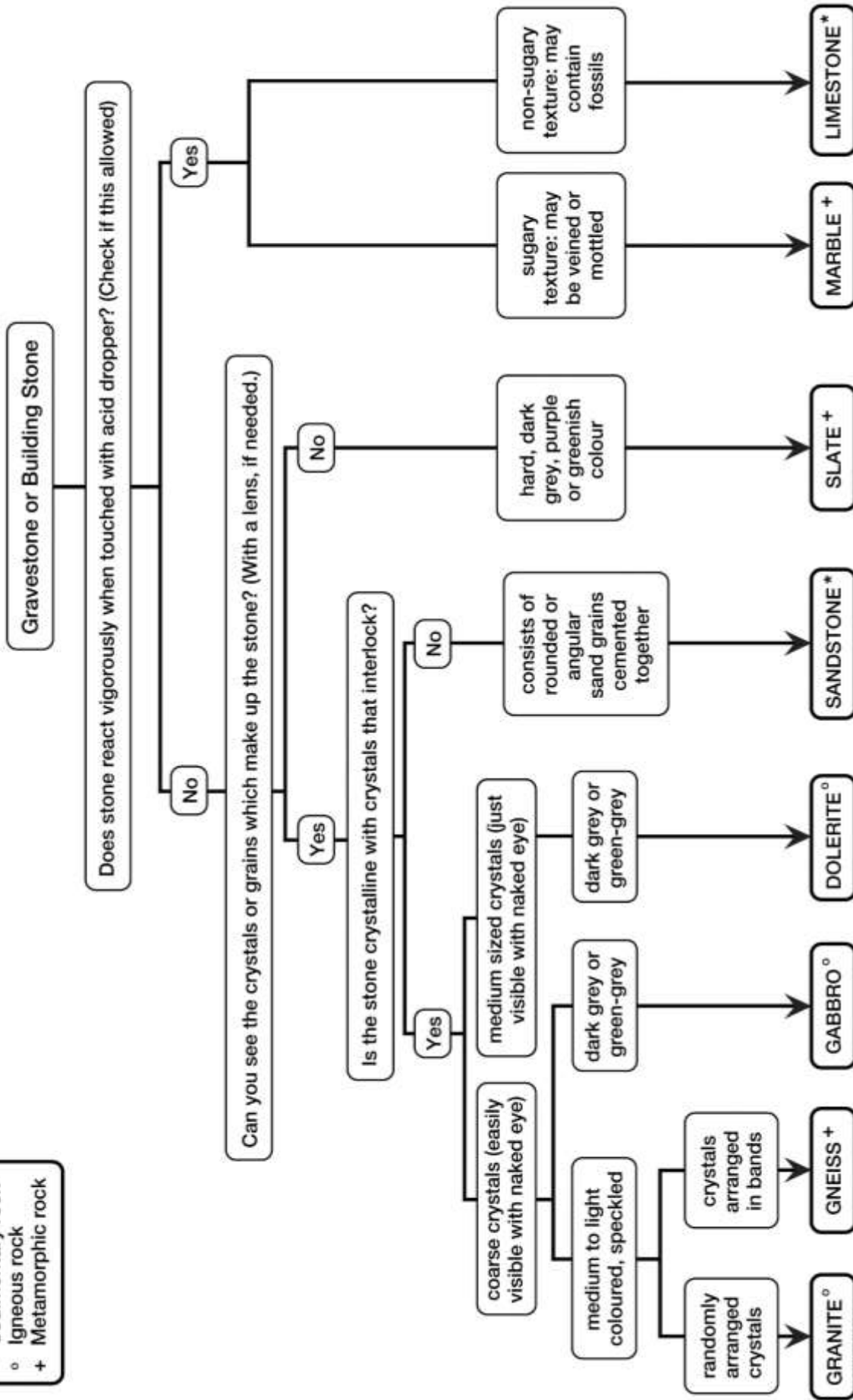
Resource list:

- copies of the key to common rocks
- paper and pencils
- clipboards
- dilute hydrochloric acid (0.5M) or limescale remover to test for the calcium carbonate in limestone and marble (optional)
- wash bottle filled with tap water

Source: Developed by Elizabeth Devon from an activity written for ESEU CPD sessions by Peter Kennett

Key to some rocks commonly used for ornamental purposes

- * Sedimentary rock
- o Igneous rock
- + Metamorphic rock



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