"The investigators - What's beneath our feet?"

QCA Geography Unit 6 "Investigating our local area."

When, as part of their science curriculum, children learn about rocks and soils, they may well ask "*What rock is beneath our feet?*" This unit encourages children to look for clues to answer this question by looking at the quarried materials used in structures built in their local area.

This unit also uses some of the "fun" activities provided in the Science unit "*We're living in rocks and SOIL!*" Teaching both units simultaneously will make efficient use of teaching time and help children acquire a more holistic understanding of the importance of local geology in both shaping their lives and landscape.

In addition, this unit provides motivating opportunities for children to develop skills and knowledge in literacy, PSHE, history and science. Most of the classroom based activities make use of the opportunities provided by ICT and an interactive whiteboard.

Unit 6 – Investigating our local area
Geography Year 3
The investigators – What's beneath our feet?
Description/overview of the unit
This unit is based upon the QCA Geography year three *Unit 6 Investigating our local area.*
The investigators- What's beneath our feet? helps schools teach the same objectives as the three core lessons of the QCA unit. However, because this unit has some overlapping objectives with the science unit *We're living in rocks and SOIL!* it can be used in conjunction with that unit. This will help make teaching more efficient and learning more holistic.
As well as learning to use maps and local plans, *The investigators- What's beneath our feet?* encourages children to look closely at some of the building materials used in their local area. The children learn about the quarried origins of these materials and the some of the important systems that ensure the safety of workers during the quarrying sequence. The children are taught, with the help of a worm, in the companion science unit *We're living in rocks and SOIL!* that there are rocks beneath every feature on the Earth's surface and that the same rocks are not found in every place.
The children then take part in an out of school local *Quarried material trail.* This focuses on the materials used in one type of local structure e.g. walls, roofs, door or window surrounds etc. The children look for patterns in material use which may indicate historic changes in land use. From the range of materials observed and their basic knowledge of how these products are obtained the children are asked to suggest what kind of rock may be hidden beneath their feet?
Finally the children look at a sample of soil taken from the school locality and see if it contains any obvious stone or pebbly material that could provide further evidence to the rock that is hidden beneath their feet.
As well as meeting the learning objectives of the QCA geography unit, *The investigators- What's beneath our feet?* encourages children to look closely at and ask questions about their local environment. It provides opportunity for developing their knowledge and skills in science, literacy
and PSHE.
Most of the classroom activities in this unit have been designed to make use of the potential of ICT and an interactive whiteboard.

Overview Teacher Introduction:
In the course of the year 3 science curriculum children often study the QCA unit *Rocks and soils*. When children learn the names of some of the common rocks (granite, limestone, chalk, coal, slate etc.) and that some are located beneath every

part of the earth's surface it is not unreasonable for them to ask "*What rock is beneath our school?*"
In many places, without recourse to geological maps, which can be difficult to interpret, the answer will probably be *"I don't know!"*
This unit does not attempt to provide a definitive answer to that question but it does use children's observation and curiosity to make a reasoned guess. That guess, though by no means accurate, for the reasons explained below, may well spark an interest in other aspects of the development of the local area.
<u>How can you tell what rock is hidden beneath our feet by looking at the locality?</u>
In some areas the answer is obvious. There will either be local cuttings by roads and railways or working or disused quarries that expose the underlying geology. Pictures of these rocks can be used to supplement the children's conclusions on which rock is hidden beneath their feet in either lesson 4 or 5 of this unit.
However, many schools are not going to have access to such an obvious solution. The nearest material that children perceive as "rock" may be miles away or may be covered by an urban landscape. Clues to answer the question will need to be sought in other aspects of the local landscape.
One location where <u>local rock</u> may be found is in the oldest structures in the locality. Heritage sites such as castles, prestigious homes, important civic amenities, (e.g. halls, bridges, walls etc.) and churches that predate the *Industrial Revolution* were often built of locally sourced durable materials.
There are of course many notable exceptions (E.g. Stonehenge was built from rocks that originated miles away.) but in many places these structures will give useful clues to local geology.
After the industrial revolution a greater choice of durable materials used in construction became available. Coal became available as a source of energy for transportation, factory machinery and kilns. This led to a greater use of bricks, made from clay, as a building material. However it made good commercial sense when the transport infrastructure was not as developed as it is today to use local clays. Locally produced bricks with particular colours and properties may be identified in many older buildings and structures.
There are a few pitfalls to avoid.

1. Sometimes "natural" stone, such as sandstone, was incorporated into brick built structures e.g. around doors and windows. This may be locally derived stone but in the case of prestigious buildings such as banks, town halls etc. the builders may have had funds to source materials from greater distances. The stone was imported and used for reasons of visual appearance.
2. Today, although bricks may be sourced locally for reasons of aesthetics (i.e. matching what exists in the local landscape) others may have brought into an area from outside the locality. Either the economics of scale of production or the properties of particular products may outweigh the advantage of "buying local."

More modern building materials such as concrete blocks are distributed over a wide area and are not a good guide to local geology.

The rock investigators- What's hidden beneath our feet?

Unit 6 Investigating our local area Geography Year 3

ABOUT THE UNIT

This is a 'long' unit, in which children develop geographical ideas and skills by studying their own locality. This unit has been adapted so that children can try to deduce, from studying their locality, the nature of the rocks that may be hidden beneath their feet. This unit is linked to our version of the QCA science unit 3D *We're living in rocks and soils.*

The unit offers links to literacy, IT, environmental education, music, education for sustainable development, maths and the world of work.

PLACES

- School locality
- UK locality
- Wider context
- Physical and human features
- Links with other places

SKILLS

- Collect and record evidence
- Undertake fieldwork
- Make maps and plans
- Use maps
- Use secondary sources
- Use ICT

THEMES

- Settlement: land use
- Environment: impact, sustainability

VOCABULARY

In this unit, children are likely to use:

- hamlet, village, town, city, settlement
- north, south, east, west
- route, scale, distance, direction, key, symbol
- homes, shops, roads, services, factory, buildings, transport, land use
- environment, repair, damage, pollution
- slopes, valleys, streams, soil

They may also use:

- words specifically associated with the locality
- words relating to the main physical and human features, land uses and occupations in the locality

The above MAY be used but bthe following are includedQuarry, manufactured, natural, supervisor

  - Terms linked to: building materials (brick, concrete etc).: quarrying procedure (blasting, sieving etc.).

RESOURCES

- globes
- local maps *eg street maps*
- Ordnance Survey maps scale 1:10,000 or 1:25,000
- Digital camera
- aerial and ground photographs
- outline plan of settlement based on oblique aerial view
- atlases
- database or graphing software
- questionnaires and worksheets
- collection of locally used building materials
- ICT and The Virtual Quarry
- Sample of local soil

PRIOR LEARNING

It is helpful if the children have:

- investigated the school buildings and grounds using plans and photographs
- investigated some basic features of their locality, as in Unit 1, for example
- drawn their own maps of how they get to school, as in Unit 1, for example
- considered routes around the school and made a simple land use map of the school and its grounds
- taken part in a simple environmental improvement programme in the school grounds, including an evaluation of the likes and dislikes of the grounds and possible improvements
- This unit could be completed alongside the adapted science unit 3D Rocks and soils "We're living in rocks and soils!"

EXPECTATIONS

at the end of this unit

most children will:	describe a range of physical and human features of their locality; use appropriate geographical terms; offer appropriate observations about locations and patterns in the area; identify how people affect the environment and recognise ways people try to manage it for the better; use a range of secondary sources and first-hand enquiry
some children will not have made so much progress and will:	respond to questions about where things are; ask and respond to questions about places and topics using information provided by the teacher; undertake simple mapping tasks demonstrated by the teacher
some children will have progressed further and will also:	use confidently a wider range of fieldwork and map skills; begin to appreciate the importance of location and offer explanations for physical or human features; ask their own questions and set up simple tasks to seek answers

FUTURE LEARNING

This unit provides a base from which children can extend their concept of **settlements,** at other scales, as in Unit 7, for example, and in other contexts, *eg Units 7 and 9,* and **environment,** *eg Unit 8.*

Children can also develop their fieldwork skills, see Unit 8, and their mapping and enquiry skills in all subsequent units.

LEARNING OBJECTIVES CHILDREN SHOULD LEARN	POSSIBLE TEACHING ACTIVITIES	LEARNING OUTCOMES CHILDREN	POINTS TO NOTE
Where is the locality in relation to other places? ***Lesson 1: Where is our school?***			
• to investigate places • about the wider context of places • to make maps and plans • to use and interpret maps	• Ask the children to locate the UK on a globe and then, on progressively larger scale maps, to locate region, county, and eventually the school and its catchment area. • Ask the children to find the school site on a map and aerial photographs. Ask them to give directions from the school to specific points in the area, recording their directions on a map and identifying features in sequence.	• locate the school and its catchment area on maps at a range of scales • plan routes around the village on a base map	
What is the school catchment area like? ***Lesson 2: What are we pointing at?***			
• about physical and human features • about land use in settlements • to use and interpret maps • to use secondary sources	• Help the children to match ground photographs of the main human and physical features to a base map of the village, naming features and listing questions for further research. Produce a class word bank.	• identify main human and physical features of the village • develop awareness and understanding of some of the land use in the village • develop annotation skills	To answer the main enquiry questions, focus activities on specific questions, *eg What are the main physical and human features? What are the main land uses? Why is the village like this?* Literacy: the work on the word bank can be linked to ongoing work on collecting and categorising vocabulary.

Ref: QCA/98/253W

LEARNING OBJECTIVES CHILDREN SHOULD LEARN	POSSIBLE TEACHING ACTIVITIES	LEARNING OUTCOMES CHILDREN	POINTS TO NOTE
What are the main land uses in the village? Replaced by Lesson 4 The Quarried Material Trail			
• to collect evidence • to use fieldwork techniques • about physical and human features • about land use in settlements • to use ICT to handle data	• To collect evidence from their locality focusing on particular building materials or structures. • To recognise some land use patterns in the use of some building materials. • To use field work techniques. • In class, collate the children's results and ask the children to present their results using ICT, *eg in databases, as simple graphs, as simple pie charts.* • Discuss the findings with the children and relate their findings to the possible underlying geology	• identify and understand different materials and some land uses • record building materials on a map using a key • present findings using ICT • Make simple deductions of underlying geology based on evidence	IT: these activities can be linked to IT when children use different types of software to present their results (Unit 4D).
What jobs do people do? How do they get to work? What services do nearby settlements provide? ***These two following optional units are replaced by Lesson 3 Safety at the beginning middle and end. (Details are in the unit)***			
• to collect and record evidence • about how the locality is linked with other places • to use and interpret maps	• With the children's help, design and conduct a class survey to identify adult jobs within and beyond the school. List the jobs and ask the children to sort them into categories and investigate where and how far people travel to work. • Ask the children to use a map or atlas to list three or four nearby towns that villagers could use to buy certain goods, *eg furniture, clothes.* Ask them to use an Ordnance Survey map to work out how they would get to these places and to produce a map describing the route they would travel to buy a pair of trainers.	• classify types of work • understand the relationship between work and travel • describe a journey, including the route and type of transport • draw a simple map to show a route	World of work: when children discuss types of jobs, location of jobs and travelling to work. Literacy: the children can consider the different formats used for recording information, *eg lists, charts,* when they identify and categorise types of jobs. *This lesson links to safety in the world of work and helps develop literacy skills

LEARNING OBJECTIVES CHILDREN SHOULD LEARN	POSSIBLE TEACHING ACTIVITIES	LEARNING OUTCOMES CHILDREN	POINTS TO NOTE
What changes have taken place in the village? Replaced by lesson 5 Which is my favourite soil(Details are in the unit)			
• to use fieldwork techniques* • to use secondary sources • about environmental impact • about sustainability	• Ask the children what happened to the bridge in the village in autumn 1997 (the main recent change in the village) and consider why it happened. • Ask the children to study photographs of the old bridge and label problems, *eg cracking arches.* Discuss with the children why these problems occurred. Discuss photographs of the 1997 bridge repairs and visit the bridge to identify improvements. • Discuss with the children other potential environmental concerns in the village and how they might be addressed.	• identify damage to the environment • describe improvements to the environment • know about other environmental concerns and how they might be addressed	Environmental education: use of an issue or event of note to stimulate investigation. Issues of sustainability and environmental impact are dealt with in the final lesson of the companion science unit.
	Where teachers want to shorten the unit, the sections under italicised questions are those that may be omitted.		**SAFETY –** All off-site visits must be carried out in accordance with LEA and school guidelines.

Lesson 1: Where is our school?

Prior Knowledge / Work:
It would help if the children had previously had access, even on an informal basis, to a globe, atlases and maps of different scales.

Learning Objectives:

- To locate the UK on a globe.
- To locate on a map the children's home city, town or village within the UK.
- To locate on local large scale maps or plans the school.

Subject Links:

- ICT: interpreting information (POS 1c)

Resources:

- A globe.
- ICT, interactive whiteboard and downloaded maps, based on the postcode of your school, from a website such as http://maps.google.co.uk/
- ICT, interactive whiteboard and downloaded aerial photos of the school from sites such as: www.getmapping.com/home

Background Information:
This lesson closely follows the initial activity in the QCA Geography Unit 6 *Investigating our local* area *(Where is the locality in relation to other places? Where is the school?)* but uses on line interactive resources as an alternative to conventional paper maps.

Activity:
Tell the children that through out this project they are going to be investigators and find out more about where they live and how they come to school.

Establish from pupil's acquired experience of either flying in aeroplanes, climbing tall structures or features such as hills and mountains that the further they are above the surface of the earth the smaller its features appear. Use ICT to show the children an aerial photograph of the school to reinforce this principle. (See resources above.)

Ask the children to locate the UK on a globe.

Using ICT and an interactive whiteboard, enter the school's postcode into an interactive mapping website such as http://maps.google.co.uk/ This website allows you to zoom out to show the children a "flat" Mercator map of the world, then progressively zoom in onto more detailed localised maps to identify the location of the region, county, city, town or village of the school.

When the children are looking at the map which shows the detail of their community ask them to point out their route to school.
The children can have fun checking their route on the above website by using the *Get directions* facility. Enter the child's postcode as the *starting point.* Ensure that the school's postcode is the finishing point. The website will display a route to school on a large scale plan, plus the directions and the distances.
The children can evaluate the suggested route as it is devised principally for people travelling by car. It may differ from the route actually taken by children.

Lesson 2: How they get building materials out of the ground.

Prior Knowledge / Work:
It would be useful if the children have had experience at using a variety of untuned percussion instruments and created "sound pictures." An alternative literacy lesson which addresses the same non musical learning objectives is provided in the companion geography unit *The investigators- What's beneath our feet?(Lesson 3)*

Learning Objectives:

- To understand how some materials are quarried and manufactured from rocks.
- To musically interpret the quarrying sequence with untuned musical instruments.
- To develop musical composing, appraising and performance skills.
- To understand that the quarrying can potentially be a noisy process.

Subject Links:

- Music performing, composing and appraising skills. (POS 1b, 1c, 2a, 3a, 3c.)
- Geography knowledge and understanding of places, patterns and processes plus environmental change and sustainable development. (POS 3a, 3e, 4b, 5a, 5b.)

Resources:

- On line Virtual Quarry.
- A selection of untuned percussion instruments.
- A collection of examples of locally used building materials obtained from a builder's merchant. (see Lesson 1)
- Worksheet 1 displayed on an interactive white board or computer screen or printed copies of each page of the worksheet. (This depends on the way you plan to develop the lesson. See below.)

Background Information:
Once planning permission for a quarry has been obtained and the top soil removed (This is often used to build embankments to screen dust and noise.) there is a basic sequence of activities that take place. The following describes this sequence for a limestone quarry.

1. Drilling. Holes are drilled in area of rock face. The holes are filled with explosives.
2. Explosion. Following a sequence of warning sirens the explosive is detonated.

3. Excavation. When a siren indicates that the detonation is safely complete a huge mechanical excavator lifts the pieces of broken rock into a dumper truck.
4. Transportation. The huge dumper truck carries a massive weight of rock and tips it into the crushing machinery.
5. Crushing. The rocks are crushed and carried on mechanical conveyors to sieves.
6. Sieving. The rock is sieved into different sizes and taken to a store.
7. Transportation. The quarry products are transported away from the quarry by road and rail.

Often, after the quarried rock has been sieved and stored, it is manufactured into products such as cement, ready mixed concrete and asphalt within the confines of the quarry. This reduces the environmental and economic cost of transporting "virgin" rock.

The quarried material is taken away and used in the construction and repair of roads and the manufacture of building materials and other products (E.g. toothpaste, farm soil improver, cleaning materials, treating and cleaning water etc.).

Activity:

Remind children of the contents of the first lesson in this unit. Use the examples collected from a local merchant to remind children that building materials are very important and that most are dug out of the ground.

Show the children the Virtual Quarry and discuss each of the different stages in the process.

Sit the children in a circle and give each child an untuned musical instrument. Some quarried products such as bricks, tiles and slates could be tapped with sticks and used as instruments.

Tell them that together they are going to compose a set of sounds that could represent the activities in the *Virtual Quarry.*

Show the children the enlarged copy of the first page of worksheet 1. *The drilling process.*

Together, using the children's acquired experience from other sources, develop a sound picture that matches the activities in this list.

To represent each activity on the list encourage the children to:

- Experiment with different kinds of sound;
- Combine different sounds;
- Change volume;
- Include rhythm;

- Use different speeds.

As "conductor" you will probably need to narrate and perhaps mime each activity on the list.

Once the children have experimented with sounds to interpret the drilling process the lesson can develop in several ways. Here are some possibilities:

- The class could practice and refine their composition for *The drilling process;*
- The class as a whole could develop the sound picture for the next quarry process *The BIG Explosion;*
- The class could divide into at least three groups and compose sound pictures for *The Big Explosion, Excavating the Rocks plus Moving and Crushing.*

Which ever way the lesson develops allow time at the end of the lesson for children to both perform and appraise their sound picture.

Lesson 3: Safety at the beginning, middle and end.

Prior Knowledge / Work:
This literacy lesson helps children understand the "quarried origins" of most common building materials. This learning occurs in the context of discussing safety issues. A musical alternative to achieving the first learning objective of this lesson is in the unit *We're living in rocks and SOIL! (Lesson 2)*
The lesson uses information contained in the *Virtual Quarry* downloaded from this website.
It could also be used after a class visit to a real working quarry!
This lesson provides an opportunity for children to cut and paste on an interactive whiteboard display.

Learning Objectives:

- To understand the origins of quarried building materials.
- To group and sequence key ideas.
- To know that safety is an important consideration in any activity.

Subject Links:

- Literacy. Non fiction reading comprehension. (POS 2c, 5f, 5g, 9a, 9b)
- PSHE and citizenship. Developing a healthy, safer lifestyle

Resources:

- ICT, interactive whiteboard and the *Virtual Quarry* downloaded from this website.
- Worksheet 1 downloaded from this *Virtual Quarry* website. *View* on the interactive whiteboard in *Reading layout* format using the option of *multiple pages.*
- A copy of the school fire and evacuation policy downloaded for display.

Background Information:

Safety is a key concern at all working quarries. A risk assessment is completed for all procedures.
Quarry workers are protected in many ways. Some of these protection and the safety procedures are highlighted in the *Virtual Quarry.*

Safety Protection

In the virtual quarry all workers wear high visibility appropriate clothing with hard hat skull protection. All workers are required to report their presence to a supervisor once inside the quarry boundary.

Safety Procedures at blasting

In the hard rock *Virtual Quarry* rock blasting takes place at clearly designated times. The blasting supervisor gives a sound (siren) and visual (red flag) warning at a fixed time before the actual blast. All other quarry workers have to leave the blast area and report to a safe area once the warning is given. The blasting supervisor checks that the blast area is clear before sheltering in a safe area. The blast is detonated and the supervisor returns to check that all explosives are detonated before sounding the "all clear." Only after the "all clear" can other quarry workers return to the quarry face.

Safety features in quarry machinery

Much quarry machinery is designed to handle large and heavy loads. Vehicles are designed for strength, good all round visibility and cab protection for the driver. The vehicles have high visibility flashing warning lights and an automatic sound warning signal when in reverse gear.

It is important to control the dust in the air both on the quarry site and on nearby roads. Quarry roadways are sprayed to reduce air borne dust pollution which could be a health hazard for quarry workers. Public roadways are sprayed and cleaned.

The quarry sequence

The following describes the sequence of activities in obtaining rock from a limestone quarry.

1. Drilling. Holes are drilled in area of rock face. The holes are filled with explosives.
2. Explosion. Following a sequence of warning signals the explosive is detonated.
3. Excavation. When a siren indicates that the detonation is safely complete a huge mechanical excavator lifts the pieces of broken rock into a dumper truck.
4. Transportation. The huge dumper truck carries a massive weight of rock and tips it into the crushing machinery.
5. Crushing. The rocks are crushed in machinery and carried on mechanical conveyors to sieves.
6. Sieving. The rock is sieved into different sizes and taken to a store.
7. Transportation. The quarry products are transported away from the quarry by road and rail to the user.

The quarried material is taken away and used in the manufacture of building materials (E.g. cement, concrete, asphalt.) and other products (E.g. toothpaste, farm soil improver, cleaning materials, treating and cleaning water etc.).

Activity:

Tell the children that they are going to find out where many of the materials used to make buildings and other structures come from.

Tell the children that they are going to watch the *Virtual Quarry*. Tell them to look carefully for anything that is designed to keep the quarry workers safe.
At the end of the *Virtual Quarry* sequence discuss the children's observations.
Replay the *Virtual Quarry* if necessary.

Now display to the children worksheet 1 in the format described in resources above.
Explain the meaning of the term *supervisor.*
Tell the children that a quarry supervisor has invented a game that is used to teach new workers how to be safe in the quarry. Tell the children that the safety instructions that the new workers need to understand are listed on page 1 of the worksheet but they are in the wrong order.

The children are to be "new workers." They are going to use the computer to cut and paste each safety instruction under a heading on page 2. Then they are going to rearrange each group of sentences into in a new more sensible order.
Firstly, together read each of the instructions.
Explain that the instructions are either for:

- *When workers arrive at the quarry.*
- *When blasting takes place.*
- *Before workers leave the quarry.*

Select a child in turn to cut and paste each rule under an appropriate heading.
Ask the child to explain the reasons for their decision.

Then select a child to cut and paste each group of sentences into a sensible order.
Discuss the children's answers.

Finally in the plenary show and discuss with the children how the school's registration and fire and evacuation policies protect their safety.

The New Quarry worker's safety game.

Here is one sensible solution. There may be other equally sensible answers.
When workers arrive at the quarry.

1. All workers must keep these rules. They are for the safety of everyone in the quarry.
2. When workers arrive they must tell the supervisor and put on their safety clothing.
3. Workers must wear their safety clothing until they leave the quarry.

When blasting takes place.

4. Workers must find out the time when blasting will take place.

5. When workers hear the siren or see the red flag they must go to the safe place.
6. Workers must stay in the safe place until the "all clear" siren sounds and the red flag is taken down.

Before workers leave the quarry.

7. At the end of the day workers must give back their safety equipment.
8. Workers must tell the supervisor that they are leaving the quarry.

To use this worksheet select:
- View – Reading Layout;
- On the toolbar select 'actual page' and the 'multiple page' option.

Delete this text box before use.

Worksheet 1

The New Quarry worker's safety game.

You are a new worker at the quarry.
Here are some rules for your safety.

1. **Cut and paste each rule under a sensible heading on Page 2.**
2. **Then rearrange each rule in a sensible order.**

At the end of the day workers must give back their safety equipment.
Workers must tell the supervisor that they are leaving the quarry.
When workers arrive they must tell the supervisor and put on their safety clothing.
Workers must wear their safety clothing until they leave the quarry
When workers hear the siren or see the red flag they must go to the safe place
All workers must keep these rules. They are for the safety of everyone in the quarry.
Workers must stay in the safe place until the "all clear" siren sounds and the red flag is taken down.
Workers must find out the time when blasting will take place.

When workers arrive at the quarry.

When blasting takes place.

Before workers leave the quarry.

Lesson 4: The quarried material trail.

Prior Knowledge / Work:
To complete this lesson children will need to know two of the key objectives of the QCA Science Unit 3D *Rocks and soils* i.e.:

- To understand that there is rock beneath the visible surface of the Earth.
- To know that there are different rocks in different locations.

Lesson 4 *I'm a rock and soil expert* of the unit *We're living in rocks and SOIL!* on this website covers these and other objectives. If you are not using the science unit you will need to incorporate that or a similar lesson into this unit.

Learning Objectives:

- To collect evidence from their locality.
- To recognise some land use patterns in the use of some building materials.
- To use field work techniques.

Subject Links:

- Science, particularly the QCA unit 3D *Rocks and Soils.*
- History: finding out about the past from observation (POS 4a)

Resources:
A clipboard and a plan of the "trail" to each pair of children.

Background Information:
In accordance with the school "out of school activities policy" you'll need to plan a safe local walk which passes buildings made of different materials.
In some areas where there is a great diversity of material you may need to focus on one particular structural feature. E.g. walls, roofs or the material around doorways and windows. Limiting the focus of observation and the range of materials may make the task more manageable for year 3 pupils.

Activity:
Tell the children that they are going to try and find out which rocks might be hidden beneath their school. Explain that they are going walk along a short trail and look at the different materials that have been used to build things near the school.
Explain that they are just going to look at the building material used in a particular situation e.g. either in walls, roofs, doorsteps or around windows and doors etc.
Give out a clipboard and plan of the trail to each pair of children.
Discuss the route and the key that can be used to identify different building material.

Take the children on the trail. Stop at appropriate points and help children:

- Orientate their plan;
- Identify the building materials used;
- Use the key and mark their plan.

On return to the classroom with the children discuss:

- The different building materials that were observed and where they were located. Remind children in simple terms about how each of these materials are obtained
- Any patterns the children noticed. I.e. were there some places where all the buildings were made of similar materials?
- The explanations children may have for those patterns.

Now remind children that most building materials are originally quarried out of the ground.

Explain that

- It can be expensive to transport heavy building materials such as stone, bricks and sand and gravel long distances.
- The building materials used around their school may have been dug from under the ground near to the school
- That the materials may give a clue to the rocks hidden beneath the soil under the school.

Ask the children to suggest which rocks <u>may</u> be hidden beneath the school and what evidence they have for their suggestion.

The results of the children's observation in this lesson can be used in a subsequent ICT or maths session to produce databases, simple graphs or pie charts.

Lesson 5: adapted from QPA Science Unit 3d, Lesson 4

Prior Knowledge / Work:
This follows all of the previous lessons in this unit, including Lesson 4 *I'm a rock and soil expert* of the science unit *We're living in rocks and SOIL!* on this website.
This lesson marginally increases the scope of lesson 5 in the science unit and the detailed lesson plan is in that unit. Only the adaptation to meet the learning objectives of this unit is described below.

Learning Objectives:
As in lesson 5 of the science unit *We're living in rocks and SOIL!* Plus

- To look for evidence in local soil of locally occurring rocks.

Subject Links:

- Science: QCA Unit *3d Rocks and soils*.
- Technology (POS 5b)

Resources:
As in lesson 5 of the science unit *We're living in rocks and SOIL!* with the additional proviso that one sample of soil should be obtained from on or near the school site to meet the objective of this unit.

Background Information:
This lesson uses the information on the feeding habits of the worm from a previous lesson to establish a purpose for examining soil and similar materials.

Activity:
Follow the lesson plan described in the science unit. Pay particular attention to the health and safety issues regarding the handling of soil highlighted in the previous lesson

When the children are given a sample of soil collected from near the school ask them to look for stones, pebbles and other small bits of rock.
Ask the children if any samples they find look similar to some of the materials found on *The Quarried Material Trail (lesson 4 above).*
Explain that these pieces of rock might be clues to the rock hidden beneath the school.

Follow the rest of the lesson plan described in lesson 5 of the science unit *We're living in rocks and SOIL!*

For a separate activity you might like to save the children's evidence of underlying geology (rock fragments in the soil sample). You and the children might be able to identify from maps or knowledge disused quarries, road cuttings etc. where rock is locally exposed.

If you could safely procure a sample of rock from these locations this could be compared to the children's evidence.