

Rocks and Fossils

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Age group

9 – 11

Curriculum focus

Science, Geography

Learning objectives

Student will:

- ▣ name the three types of rock
- ▣ match rocks to their names using observations and a key
- ▣ explain what a fossil is
- ▣ use their learning to make distinctions between man-made materials, fossils and rocks.

Older students can also:

- ▣ name some processes in the rock cycle
- ▣ observe crystals and layers in rocks to identify them using a key.

Time needed

55 – 80 mins

About this activity

- ▣ Students use stimulus photos to consider what things come out of the ground and how these are useful.
- ▣ They observe a selection of rock samples and identify them using a key card, considering ideas of classification and sorting. They then build on this to explore the three main rock types, with older students exploring the rock cycle and some of the main processes by which rocks are transformed from one type into another.
- ▣ Students then consolidate their knowledge, using the key card to classify rocks that are more difficult to sort.
- ▣ Younger students can finally check their understanding of the differences by sorting rocks, fossils and man-made materials.

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What you will need

- ▣ Rocks and Fossils boxes
- ▣ Selection of man-made and natural materials:
 - A piece of pink Granite
 - A piece of grey Granite
 - A mixture of minerals (Galena, Barite, Fluorite and Calcite, crushed gravel size)
- ▣ Student workbook (one for each student)
- ▣ Rock cards and Rock names (one set per group)
- ▣ Rock key sheet (one set per group)
- ▣ Life Before Us sheet (one set per group)
- ▣ Photosheets (one set per group)
- ▣ Presentation slideshow
- ▣ Projector or interactive whiteboard
- ▣ Prizes (pencils, rubbers, sharpeners etc.) for activities that you decide to make into a competition
- ▣ For optional activity 6:
 - sets of four mineral samples: Galena, Barite, Fluorite, Calcite
 - selection of pieces of, or objects made from, brick, plastic, wood and glass (one of each per group)

Timings and structure

Total time: 55 – 80 mins

| Activity | Time (mins) |
|-----------------------------------|----------------|
| Introduction and Q&A | 10 |
| Activity 1: Photos and questions | 10 |
| Activity 2: Rock card game | 15 |
| Activity 3: Detective task | 15 |
| Activity 5: The life of a fossil* | 15 |
| Activity 6: Sorting materials* | 10 |
| Round up | 5 |

* optional activities

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Deliver the activities

Introduction and Q&A (10 mins)

Introduce yourself and the topic of rocks.

1. Explain who you are and what you do for BP.
2. For older primary pupils ask a few simple questions to find out how much they know about BP and why it might be interested in rocks.

Activity 1: Photos and questions (10 mins)

Use photos to explore what's underground and what can come out of it.

1. Introduce the four colour photos on slides 2 - 5 to start the discussion with the whole class.
2. Ask open-ended questions relating to each picture, for example:
 - A: Landscape: what things do you think lie under these houses?
 - B: Children digging: if these children kept digging what do you think they might find?
 - C: Quarry face and truck: what do you think they are digging for here?
 - D: Drilling rig: what do you think this drill is looking for in the ground?

Activity 2: Rock card game (15 mins)

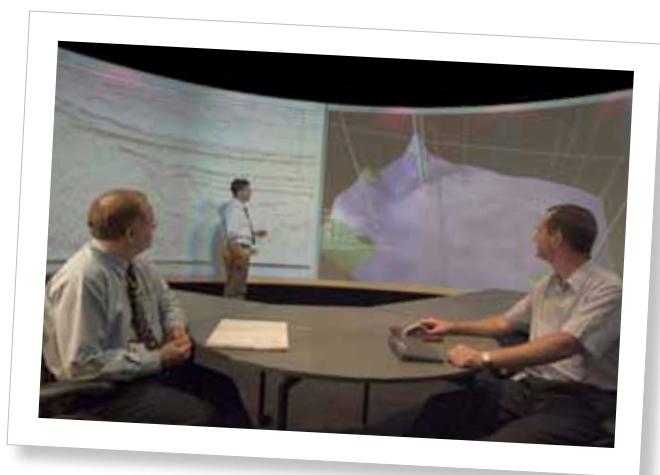
Use a key to classify rocks.

1. Divide the class into groups of two to five.
2. Explain that the task is a matching exercise where students have to match up rocks with picture cards.
3. Hand out the 12 Rock cards, 12 Rock names and the Rock key.
4. Match up Rock card 1 as a class, as an example. Ask the groups to match up all the remaining pairs of cards.
5. Ask each group to lay the matched cards out on their desks, making sure that the rock numbers are visible, as they will be using these later.
6. Hand out the Student workbooks. Ask students to write their name on the front and fill in their answers in the first column (actual name of rock) on page 2. They should not complete the 'Rock type' column yet.
7. Now ask the class if they know the names of the three groups that rocks can be divided into – sedimentary, igneous and metamorphic. (The title of the third column in the table should give them a clue.)
8. Explain that these three groups help to sort rocks because rocks in each group are similar, although members of the same group might not look alike. Compare this to the fact that girls and boys are divided into two groups, but within each group there can be lots of differences (e.g. eye/hair colour). Show the pink and grey Granite as an example.

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9. Use slides 6-17 to explain the differences between rock types and give an explanation of rock formation, 'following' a rock as it 'starts' as magma and then moves through the rock cycle. Include students' own ideas and think of ways that a rock might be weathered or eroded (heavy rain, frost, walkers using a popular path etc.).
10. Ask students to complete their tables by filling in the second column with the letters L, S or M.
11. Read out the correct answers, checking some with students along the way.
12. Collect in the Rock cards and Rock names but leave out the Rock key.



Activity 3: Detective task (15 mins)

Use a key to solve a rock mystery.

1. Students should work in pairs or a maximum of three per group.
2. Before you hand out the rock boxes explain that this is another detective task. Students must find out the names of three rocks which all fizz with acid. Check that students know what an acid is and what it can do. Remind students that they should only have one rock out of the box at a time.
3. Hand out the rock boxes and get students to put the lid upside down so they cannot read the names of the rocks. Explain that students need to look at rocks 6, 10 and 13. Review the instructions on page 2 of their workbook.
4. Using their Rock key, ask students to tell you how many rock types fizz with acid. The answer is two (Limestone and Marble). They should note that as they're searching for the names of three rocks, but only two types, two of the rocks must share the same type, even though they look different.
5. Check students' answers (6 is White Marble, 10 is Limestone and 13 is Oolitic Limestone). Go back to slide 11 to reinforce the concept of the two types of limestone.

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Activity 4: The life of a fossil (15 mins)

Students identify a range of fossils.

1. Ask students to use their own ideas and examples to tell you what a fossil is. Help students identify key words including 'dead' and 'preserved'. Show slides 18-23 to help your discussion and summarise key points.
2. Optionally, show slides 24–25 to make the link between fossils and fossil fuels.
3. Distribute the fossil boxes and again tell students to turn the lids of the boxes upside down, so they can't see the names. Remind students to have only one fossil out of the box at a time.
4. In their groups, students examine each fossil and try to work out what it might be. They write their ideas in the second column on page 3.
5. After a few minutes, ask students to turn the lids over to discover the real name of the fossil and fill in the column.
6. Distribute the Life Before Us sheets and discuss some or all fossils as a class.
7. Optionally, invite students to draw a sketch of their favourite fossil and to write some facts about it next to the picture.
8. Remind students to return all the fossils to the right section, using the photo on the lid as a guide. Collect the fossil boxes.

Activity 5: Sorting materials (10 mins)

Sort and classify a selection of man-made materials, rocks and fossils.

1. Ask groups to sort their selection into man-made and natural materials.
2. Review how students have grouped their materials. Explain that geologists use special ways of sorting to group and classify rocks and minerals.
3. Ask them to sort their selection of natural materials into things that do or don't come out of the ground. You may wish for older students to come up with their own categorisation criteria.
4. Now ask them to use their own ideas to sort the things that come out of the ground into smaller sets. How could they classify these materials?
5. Ask questions to find out how students think geologists sort different rocks etc. Use the ideas in the 'Sorting rocks and minerals' PDF to help you and then discuss how these ideas show up in the Rock key.

Round up (5 mins)

Students reflect on their performance.

1. Thank students for their attention.
2. With students' help, sum up what they've learned. If groups participated in different activities, students from each group could talk about what they did.
3. Remind them that if they find this interesting, they could continue to study and perhaps even become a geologist or Earth scientist one day – maybe even for BP.