

Geology Trail

Stages 4-5 Student Activity Sheets

Minerals are the building blocks of rocks and are made up of elements. They come in many different forms with some forming crystals with distinctive shapes. Rocks are made from grains of one or more mineral.



Use the displays in the *Albert Chapman Mineral Collection* and the *Planet of Minerals* exhibitions to complete the activities. The Geology Trail activity has been divided into three sections. It does not have to be completed in order.

Activity A: Minerals and Colour!

Aim

To investigate what determines the colour of a mineral.

Hypothesis

The colour of a mineral is influenced by the elements it contains.

Method

- Go to the *Albert Chapman Mineral Collection*. Spend five minutes looking around the exhibition.
1. Choose a mineral colour that you like. Record the name of a mineral of this colour and its chemical name in Table 1.

My chosen colour is: _____

2. Choose three other minerals of the same colour and fill in the first three columns of Table 1.
 - Go to 'The Mineral Wheel' just inside the door of the *Planet of Minerals* exhibition. Above this Mineral Wheel is a Periodic Table of Elements.
3. Use the Mineral Wheel to help you complete column 4 of the table.

Results

Table 1: Chemical Composition of Minerals

1. Name of the mineral	2. Colour/s	3. Chemical name	4. Elements in the mineral
Example: Pyrite	Gold	Iron sulfide	Iron Sulfur

4. Use the information you have collected to answer the following questions.

a) Are there any elements, which are present in all or most of the minerals in your table?

b) Can you see any links between colour and the elements in the mineral?

c) Are there any exceptions?

Conclusion

5. Write a conclusion for your investigation stating whether or not your hypothesis is supported.

Discussion

6. What other factors could cause minerals to display different colours?

Have a think about this and then back at school search the internet for additional information.



Outside the *Planet of Minerals* exhibition are Gemstones! What is a gemstone?
Which is your favourite and why?

Activity B: Types of Rocks

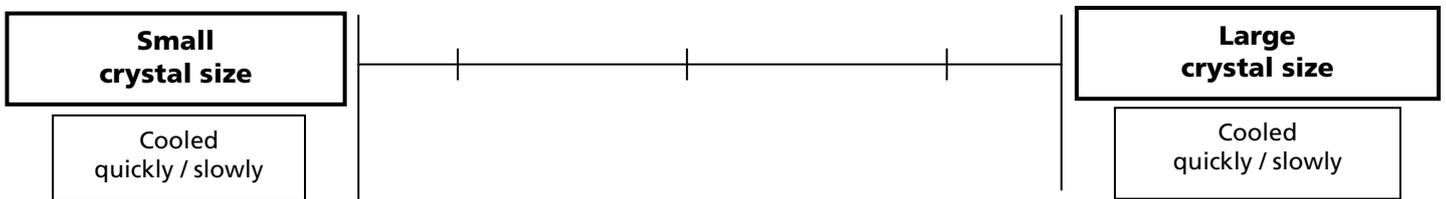
Aim

To find out about crystals in the three types of rocks.

Crystals formed in igneous rocks (Rocks formed from molten materials)

- Go to the Planet of Minerals exhibition on Level 1. Spend 5 minutes looking around the exhibition.
- Look at the displays 'Minerals in Lavas' and 'Minerals of the Molten Masses' (on the left hand side of the exhibition).

1. Rocks are made of smaller units called minerals and these minerals often form crystals. Place the following three rocks in order of crystal size along the line: dolerite, basalt, granite



2. Circle the correct word in the boxes above to show the speed at which they cooled.

3. Suggest a possible reason for some crystals cooling more quickly than others.



Crystals formed in Sedimentary Rocks

(rocks formed from dissolved minerals or from accumulated sediments, cemented together)

➤ Look at 'Rock Groups' display just inside the door of the *Planet of Minerals* exhibition.

4. Name the sedimentary rock. _____

5. Describe its colour and grain size. _____

6. What mineral makes up most of this rock? _____

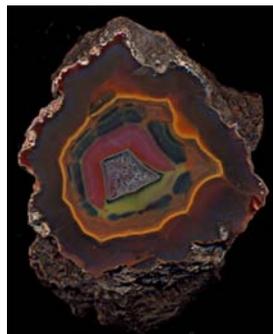
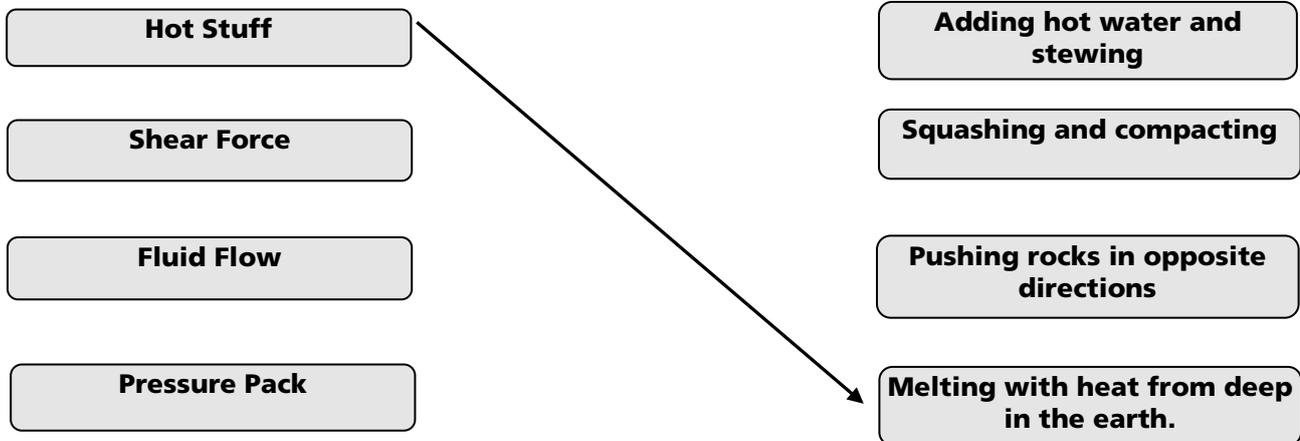
Other sedimentary rocks to look out for are limestone and shale!

Crystals formed in Metamorphic Rocks

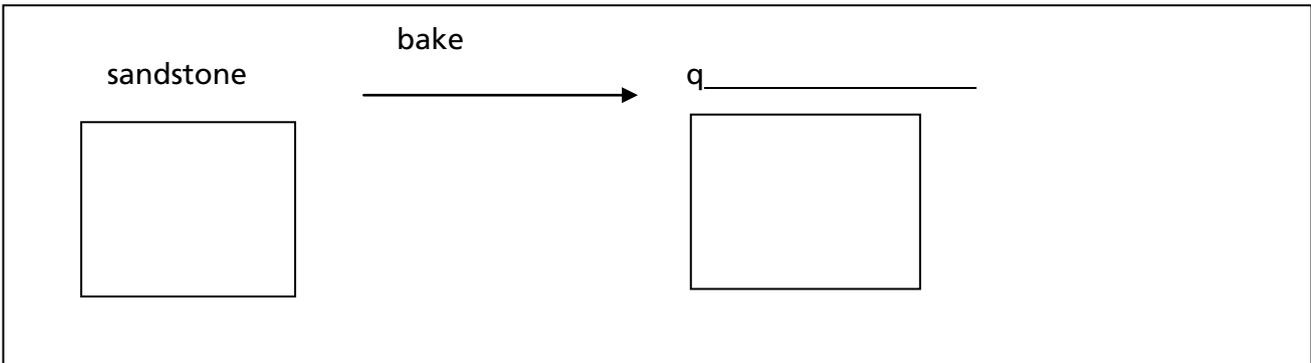
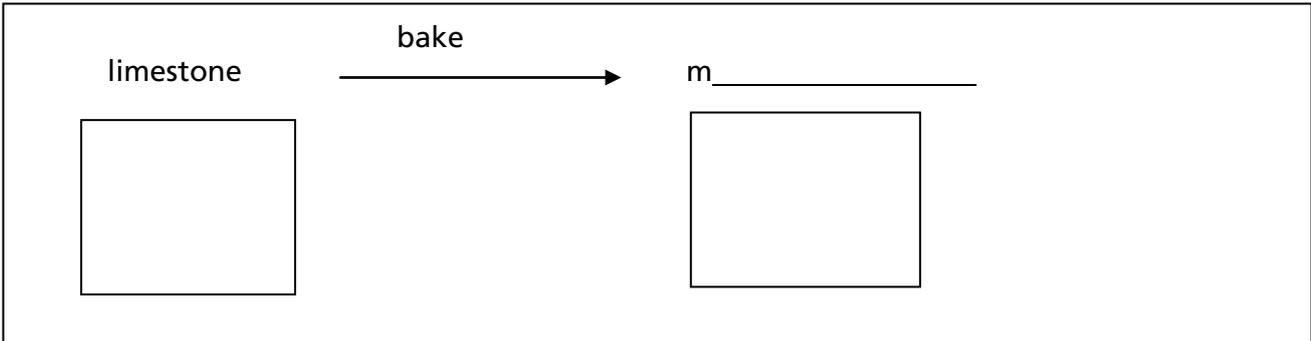
(rocks that have undergone change)

➤ Look at the 'Cooking Minerals' display (half way down on the left hand side) in the *Planet of Minerals* exhibition.

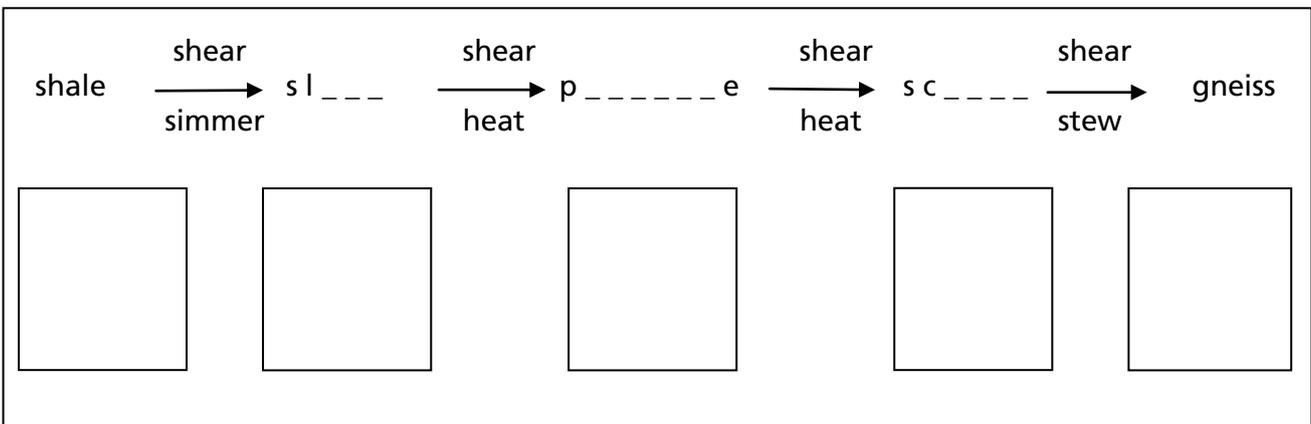
7. Metamorphic rocks are rocks that have undergone change. There are four ways this change takes place. Draw lines to connect the four ways of change with their description.



8. Complete the following diagrams by adding the name of the metamorphic rock which has formed. In the boxes write a brief description of each rock's appearance, such as its colour, crystal size and layering.



9. Sometimes rocks change more than once. Complete this diagram to show how shale can change into gneiss. Don't forget to fill in a description of each rock.



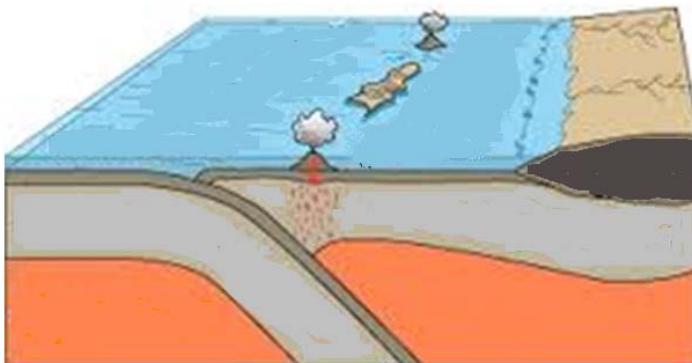
10. In which group of rocks (sedimentary, igneous or metamorphic) would you expect to find fossilised materials? HINT: Think about how each of these rock types forms!

Activity C: Australia's Geological Wealth

Aim: To identify features of Australia's geological wealth.

➤ Look at *The Dynamic Underworld* panel on the left hand side of the gallery.

1. On the diagram below label the oceanic plate, continental plate, subduction zone with arrows showing the direction of plate movement, an island arc and a trench.
2. Extend this diagram to the left by drawing in another oceanic plate to show sea floor spreading. Include arrows to show the direction of movement.



➤ Look at the section on Hot Spots at the far end of the gallery.

3. What is a hot spot? _____
4. List three sites in Australia where past volcanic activity has occurred.

5. Name three minerals which occur because of these Eastern Hot Spots.

➤ Look at the information along the right hand section of the gallery.

6. Commonly mined minerals in Australia include copper, lead, iron, silver, zinc and gold. Most of these minerals are rarely found in their pure (element only) form but rather as a compound often called an ore. Choose **three** of these minerals and complete the following table.

Chosen mineral	Location found	Name of form found in!

7. Look at the large Geological Relief Map of NSW. Find the area where you live. Is the main rock type sedimentary or igneous? Do you know of any mining that occurs in the area? If so, what?
