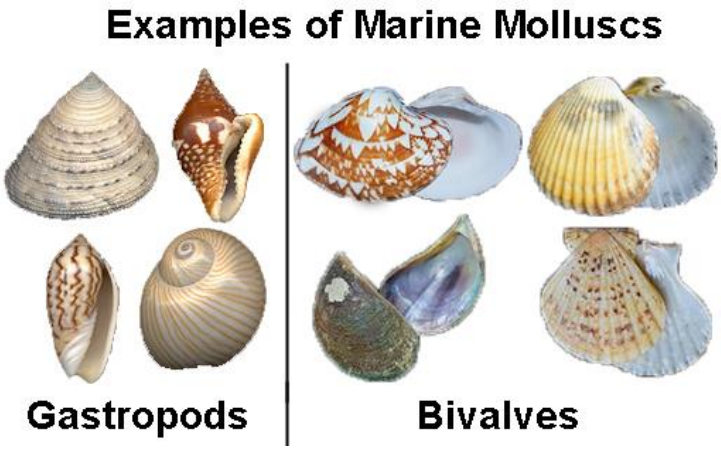
Life in the Eromanga Sea

Many beautiful and valuable Opalised fossils have been found in the wide area that was once covered by the Eromanga Sea.

Although none of your activities can include such fossils, you will be able to use fossils of marine molluscs preserved in limestone, seashells collected on the beach as well as photographs of Opalised fossils.

The most numerous of the fossils from the Eromanga Sea are molluscs, crinoids and the belemnites that were described in your Information Booklet.

Molluscs



The 'shellfish' that you find on the beach, and the animals that were fossilized in the Eromanga Sea are examples of a group of animals called **molluscs**. They have soft bodies inside hard outer shells.
Garden snails are examples of molluscs.
Two main groups of shellfish exist — gastropods that have one shell and bivalves that have two shells. The adjacent photograph illustrates the difference between gastropod and bivalve molluscs.

Looking at Some Molluscs

You will need a variety of molluscs, either fossils or collected from the beach.

1 Divide them into two groups — gastropods and bivalves.

a. Of which group do you have more specimens? _____

b. In which group do the animals have the harder shells? _____

2 In the spaces provided below, sketch one example of each type of specimen. Indicate the size of each specimen. Include the name of the species if you know it.

3 The photograph below shows two views of an Opalised marine mollusc.

a. To which of the marine mollusc groups shown on the previous page does this specimen belong?

_____

4 The statements below describe the sequence of processes that led to the opalisation of the shells after the animal died.

Write the numbers 1 to 4 in front of each description to indicate the likely order in which the processes occurred.

___ The liquid hardened to form opal

___ A liquid containing spheres of hydrated silica filled the hollow.

___ The animal was buried by sediments falling through the water.

___ The dead animal settled in soft mud.

___ The shells decayed, leaving a hollow mould.

___ The animal itself was soft and decayed quickly.

___ The sediments surrounding the shells hardened to form a rock.

5 When you have determined the correct order in which the opal fossils were formed from the shells surrounding a live animal, draw a series of diagrams illustrating these processes.

Crinoids

Crinoids are commonly known as sea lilies, though they are animals, not plants. They are related to starfish and sea urchins, but they attach themselves to the ocean floor. They have feathery, tentacle-like 'arms' that open up like a flower and capture particles of food such as plankton. They first appeared 488 million years ago, before the Eromanga Sea was formed, and many crinoid species still exist.

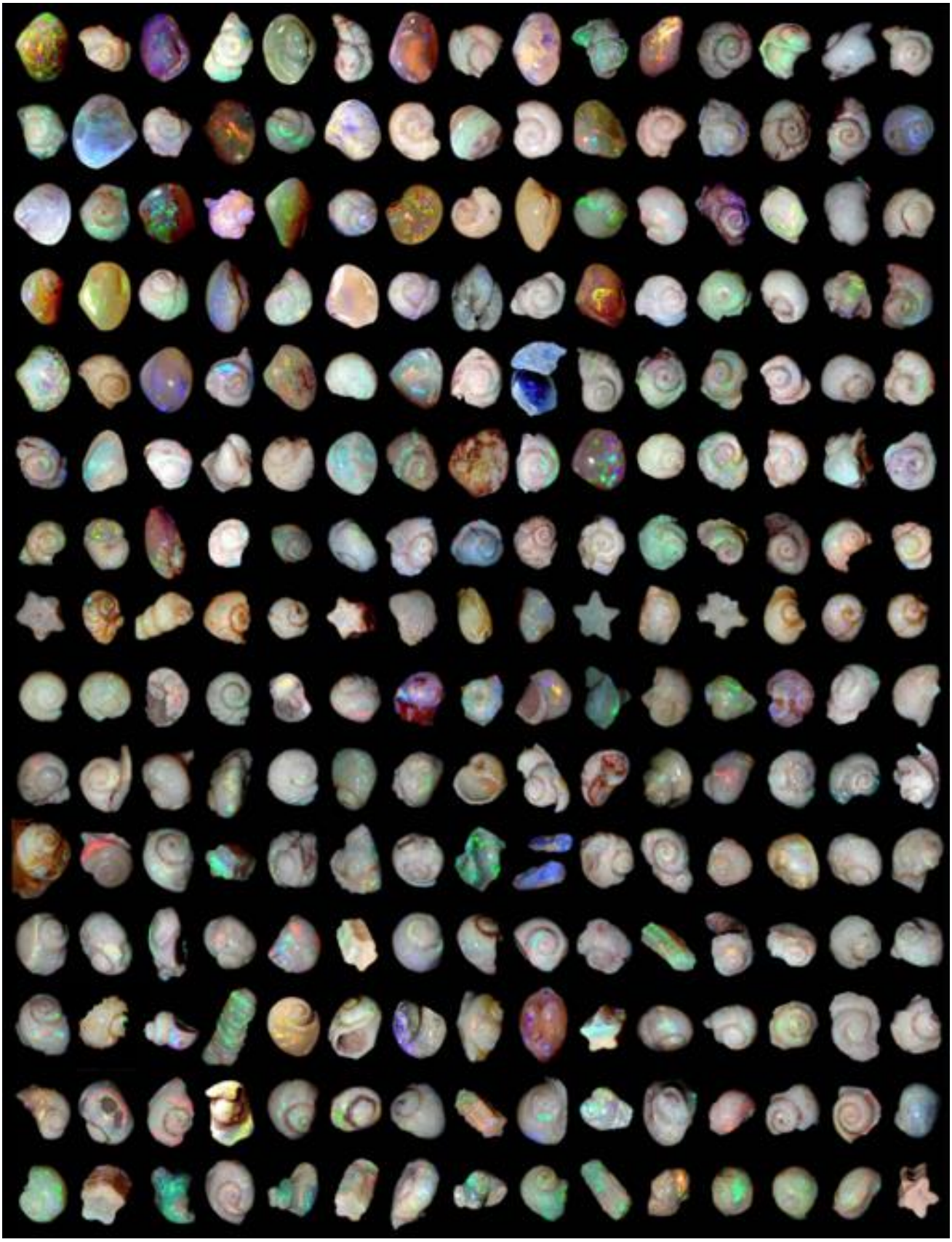
The photographs below show a living crinoid under the sea and some examples of fossilized parts of crinoids.

A living crinoid

Some Crinoid Fossils

Examine and sketch any crinoid fossils that are available. Your sketches should indicate the size of the object you are drawing.

A Page of Opalised Fossils



Photographed by Stefan Schuster schuster-frankfurt@t-online.de

The questions on this page refer to the fossils shown in the photograph on the previous page.

1 Name four groups of animals that are represented in this fossil collection.

_____

2 a. Are you able to distinguish all the animals shown in the photograph? _____

b. Suggest reasons for any difficulties you may have.

_____

_____

3 a. For which two groups do the fossils appear quite similar?

_____

b. Describe any clues that help you to correctly identify most of the specimens of these groups.

_____

_____

4 In the table below, give the names of the animal groups named in question 1 in order, from most abundant to least abundant.

Abundance	**Most Abundant** →			**Least Abundant**
Animal group				
Approximate number of specimens				

5 a. Compare the proportions of the different types of mollusc fossils with those you looked at in the questions about molluscs.

_____

_____

b. With the aid of references if necessary, suggest some reasons for your answers to question 5a.

_____

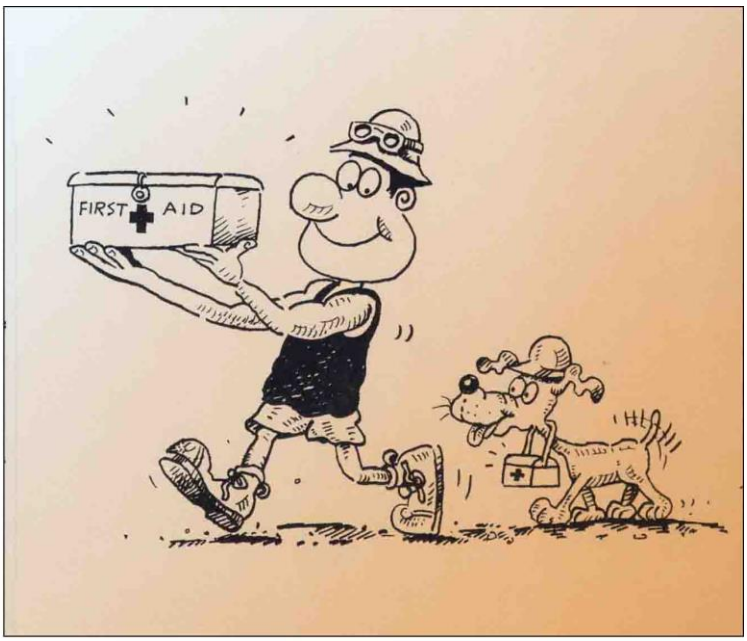
_____

Safety in Mining

The cartoons below and on the next page give advice on several aspects of mining safety. The warnings shown in the cartoons deal with the following hazards and aspects of mining safety.

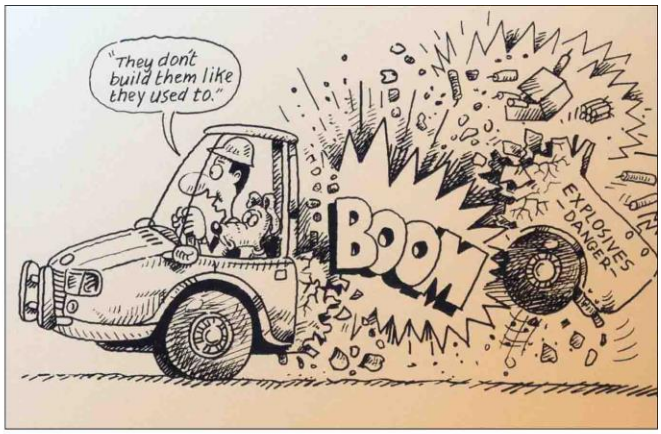
- **Electrical equipment**
- **Explosives**
- **First aid kits**
- **Mine shafts**
- **Mobile machinery**
- **Personal Safety Equipment**
- **Unstable ground**
- **Winches**

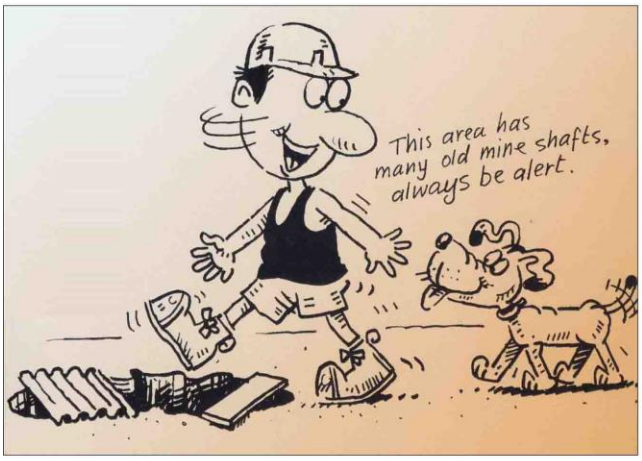
1 On the line below each cartoon, name the type of hazard that the cartoon is warning you about, or requirements for ensuring your safety and that on anyone who is working with you.

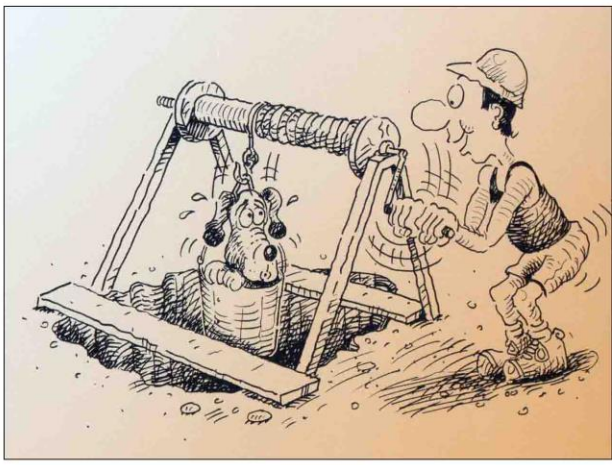


_____ _____

ZZZZ
"Pack it in spot."
SIZZLE
SNAP
CHOMP
DANGER


"They don't build them like they used to."
BOOM
EXPLOSIVES
DANGER


This area has many old mine shafts, always be alert.



Now he's gone I can take off all this protective stuff.
INSPECTOR

RUMBLE
RUMBLE
"Look lots of lovely opal!"
SMASH

2 For each cartoon, write one or two sentences of advice to miners on how they can increase their own safety and that of the people they are working with.

a. Electrical equipment

_____

_____

b. Explosives

_____

_____

c. First aid kits

_____

_____

d. Mine shafts

_____

_____

e. Mobile machinery

_____

_____

f. Personal Safety Equipment

_____

_____

g. Unstable ground

_____

_____

h. Winches

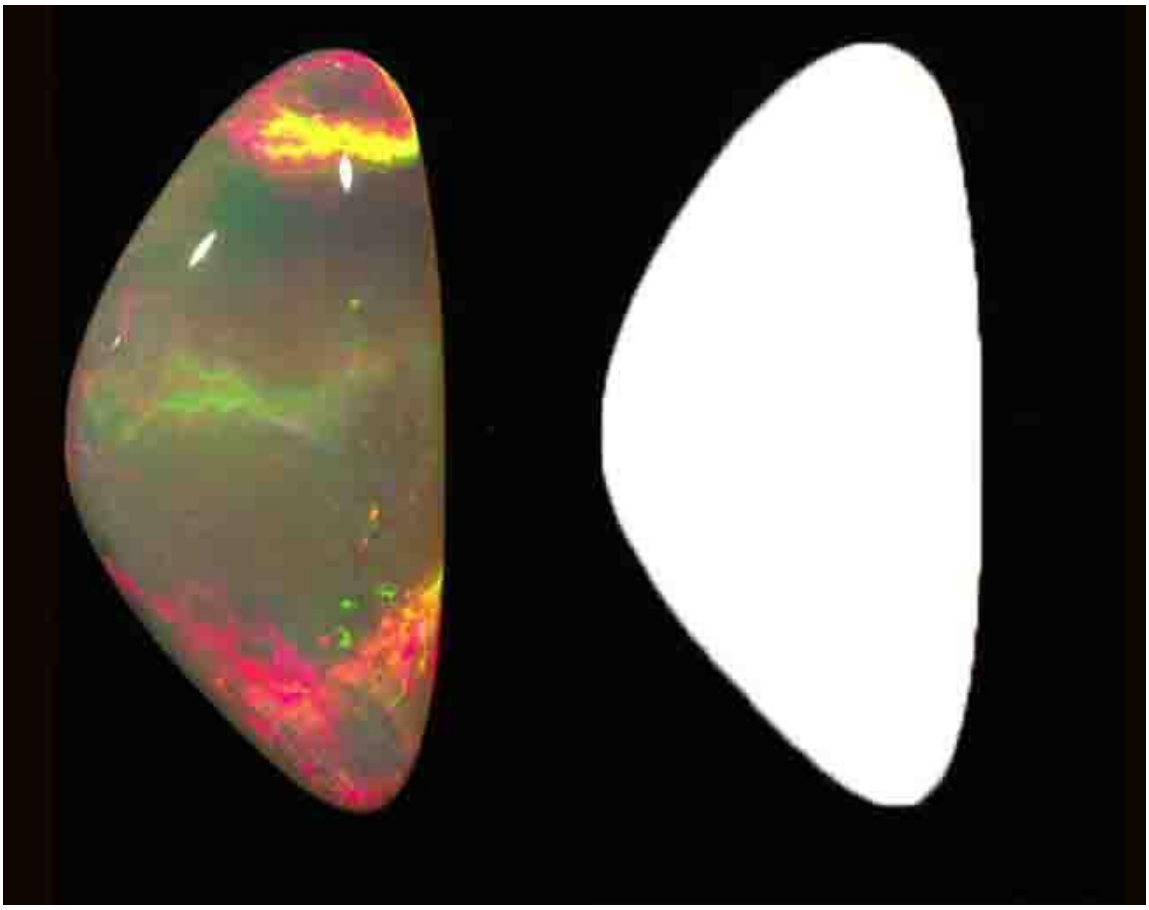
_____

_____

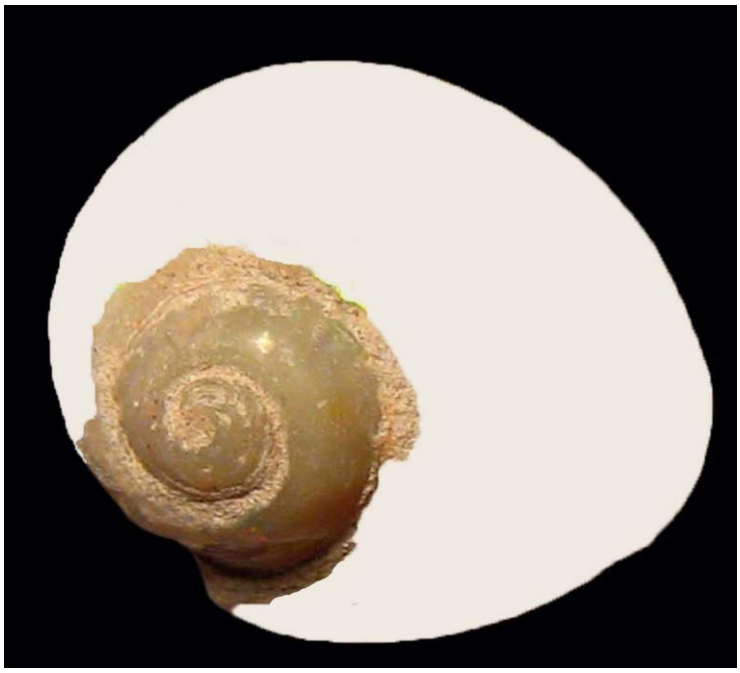
Types and Colours of Opals

You will need some coloured pencils for this activity.

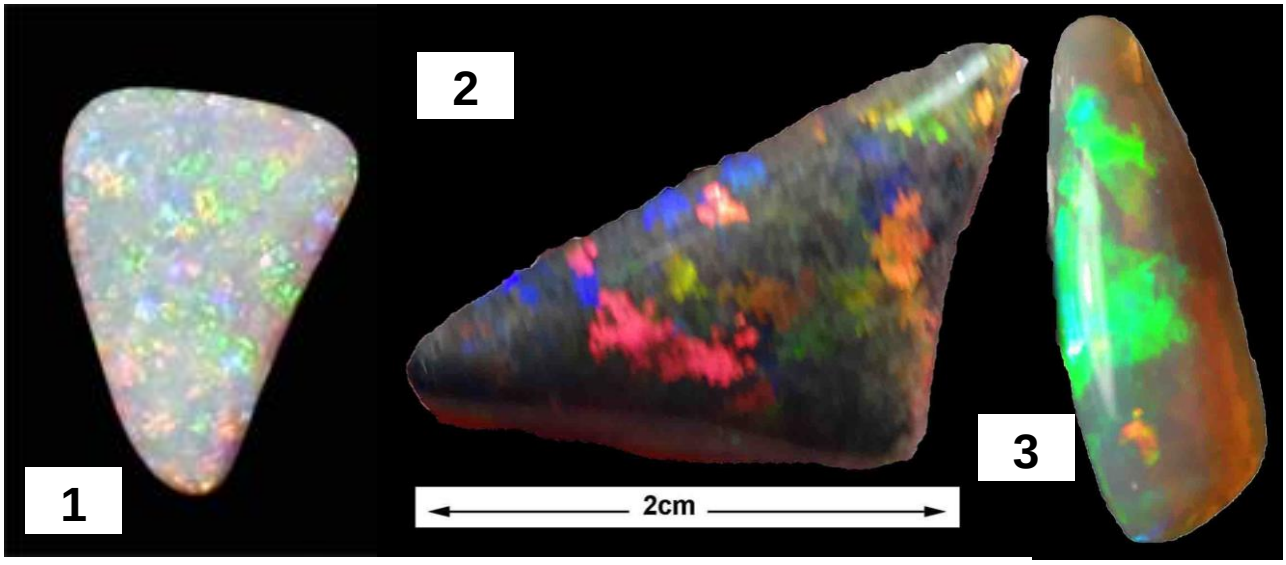
1 See how well you can copy the beautiful colours of the rainbow opal shown in the photograph below.



2 Use your own ideas and colour patterns to 'opalise' the gastropod shell shown in the adjacent photograph.



3 The photographs below show 3 types of opal. Name each type of opal.



1. _____ 2. _____ 3. _____

4 The photograph below shows some beautiful pieces of jewellery made largely from opal.

Explain why the opal used to make this jewellery is very special.

_____

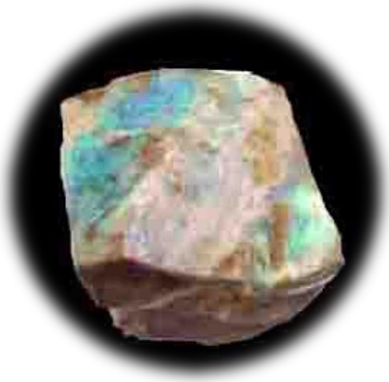
3. Visit to Majestic Opals

Majestic Opals is a family concern run by Sophia and John Provatidis that has been mining since 1964. They mine, they cut, they set their own opals and they sell direct from the mines to the buyer.

The photograph below shows their beautiful showroom, which contains a variety of opal specimens, from uncut stone to the finished product — magnificent jewellery.

Majestic Opals' beautiful showroom

The adjacent photograph shows an example of an uncut stone, part of the interesting collection of rough stones illustrated on the next page.



These mixtures of stones and opal may be known as 'painted ladies'.

The layer of opal on these specimens is often too thin to produce a solid stone, but it may possible be used in a doublet or a triplet.

Sophia will show you the wide range of opal jewellery for sale in her magnificent salon.

An example of this jewellery is shown in the adjacent photograph.

You will also see some very rare collections of opalised fossils, including the chronosaurus tooth described in the information booklet.

Both the jewellery pieces shown in the photographs below were made from opalised fossils.

Sophia will show you the raw materials from which opal jewellery is made, gem crystal opal, including fossils, as well as black and boulder opal.

The photographs below show some examples of polished opals, ready to be made into a piece of jewellery.

You will be able to watch a demonstration of jewellery cutting.

You will be given a small rough stone, and inexpensive gifts will be available for you to purchase.

4. Visit to South Australian Museum

Opals and opalised fossils can be found in two locations on level 3 of the South Australian Museum.

These are the Origin Energy Fossil Gallery and the Minerals and Meteorites Gallery.

Origin Energy Fossil Gallery

Most of the fossils in this gallery were formed in the Eromanga Sea.

Look carefully at the Plesiosaur Skeleton

1 Name at least four different types of bones that you can identify:

a. _____ b. _____

c. _____ d. _____

2 Name at one very important part of the skeleton that is missing. _____

3 Suggest at least one reason why the skeleton in front of you is incomplete.

_____

_____

3 By observing the fossil and the reconstruction above the glass case, and reading the information provided, describe the following features of the animal:

a. Its habitat _____

b. Features that helped it to live in that habitat.

_____

_____

c. Its diet _____

d. When it lived _____

e. Its length _____

4 Name some animals alive today that live in similar ways to this plesiosaur.

_____

5 The diagrams below show three animals whose fossilised remains are present in this gallery.

They are an ammonite, a nautiloid and an ichthyosaur.

_____ _____ _____

a. Look around the gallery to locate the animals that formed the fossils.

Write the names below the appropriate pictures.

b. Describe a significant feature of the ammonite fossil Shown on the wall of this room.

_____

6 Look around the gallery and locate the photographs below, which show examples of living animals and plants that became opalised after they died.

_____ _____

a. Write underneath each photograph the type of animal or plant that has been opalised.

b. Compare the forms of opal that have been formed in the two specimens.

_____

_____