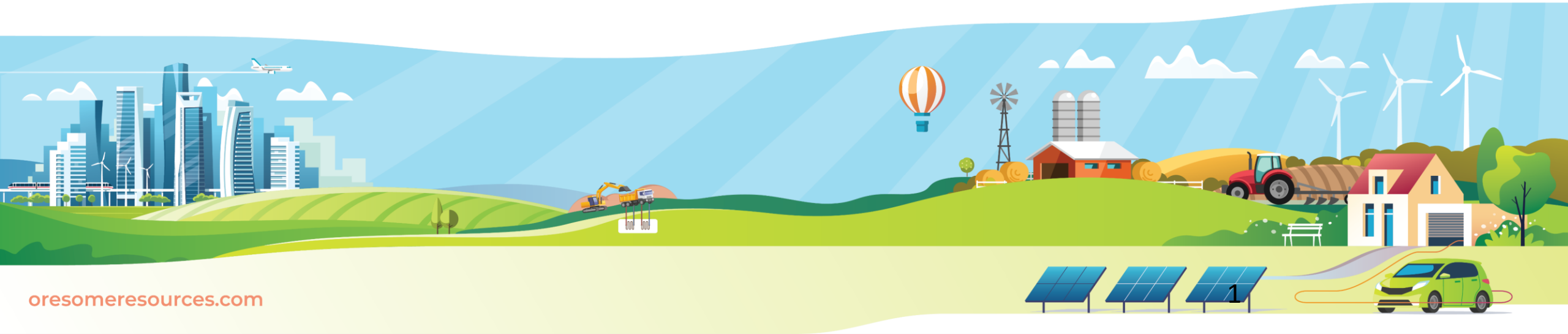
ORESOME RESOURCES
Minerals and Energy Education

When We Mine



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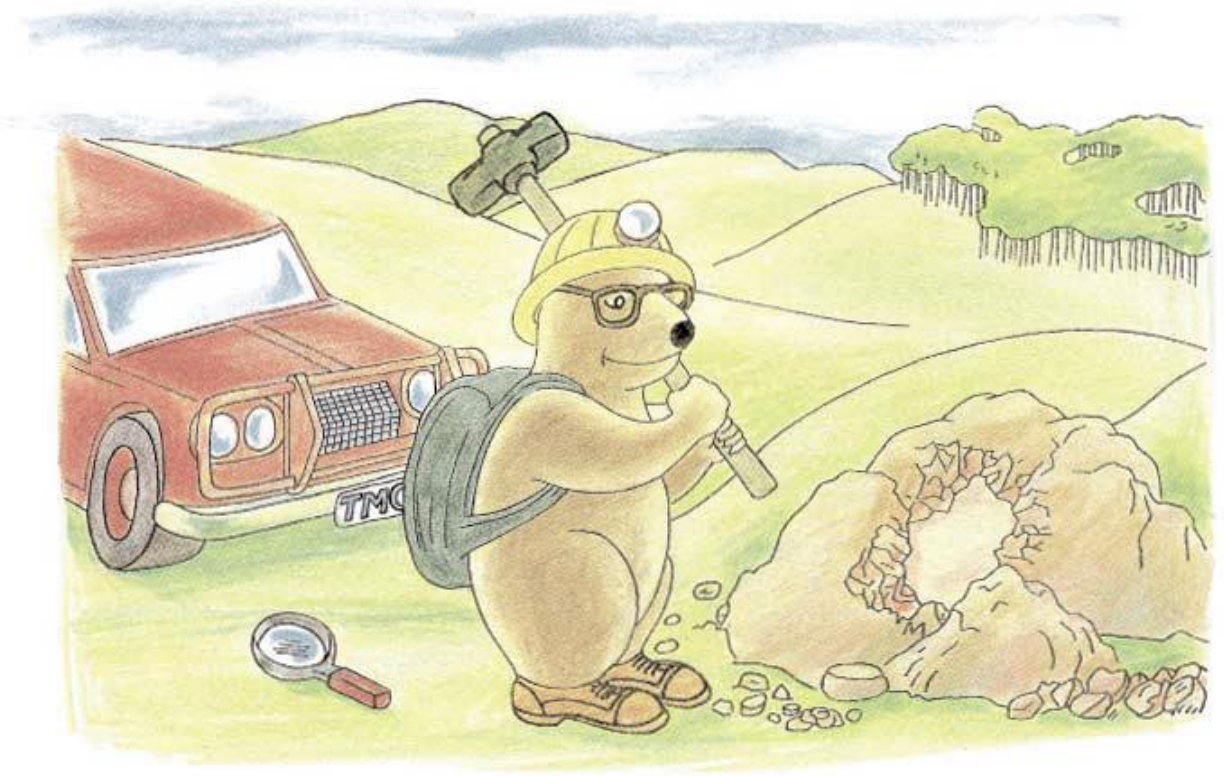
A person who knows about rocks and minerals is a GEOLOGIST.

An EXPLORATION GEOLOGIST looks for minerals or coal.



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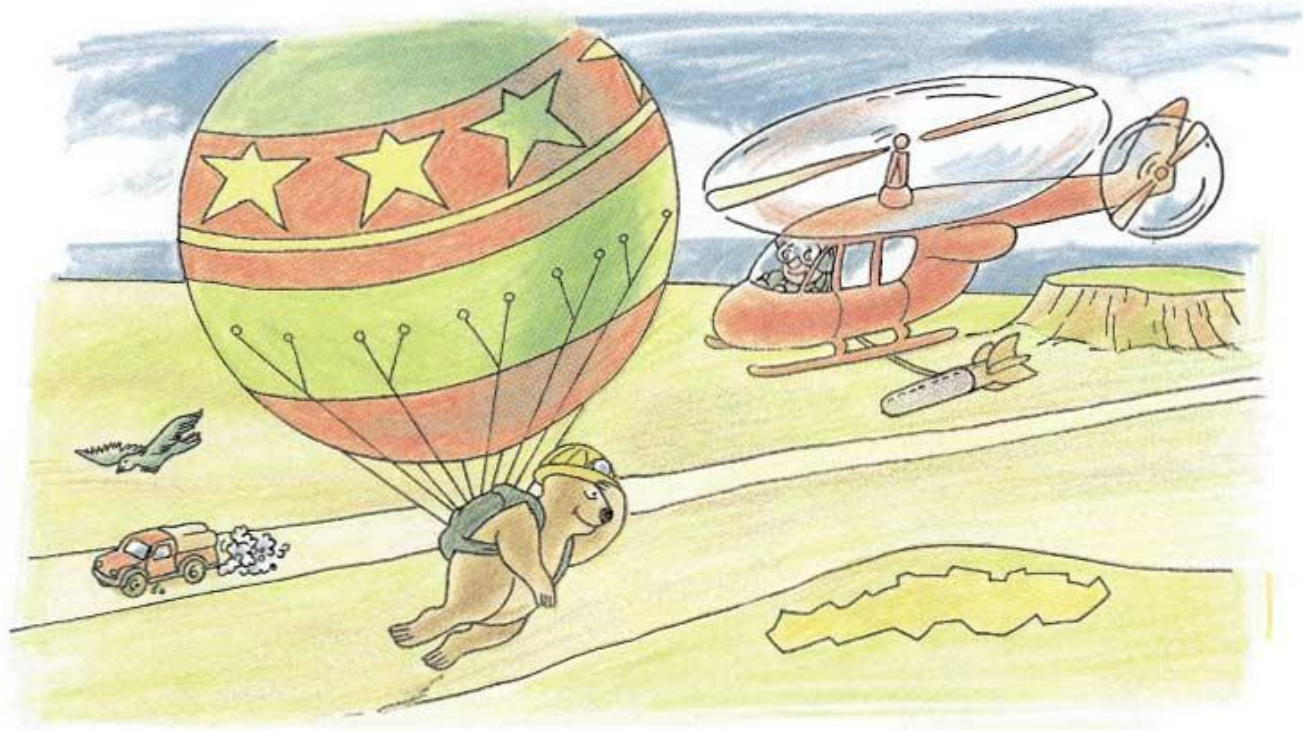
Teams of geologists use many ways to explore for minerals. Helicopters, planes and satellites are sometimes used to gather information. Only a small area of land is disturbed when they search for minerals.



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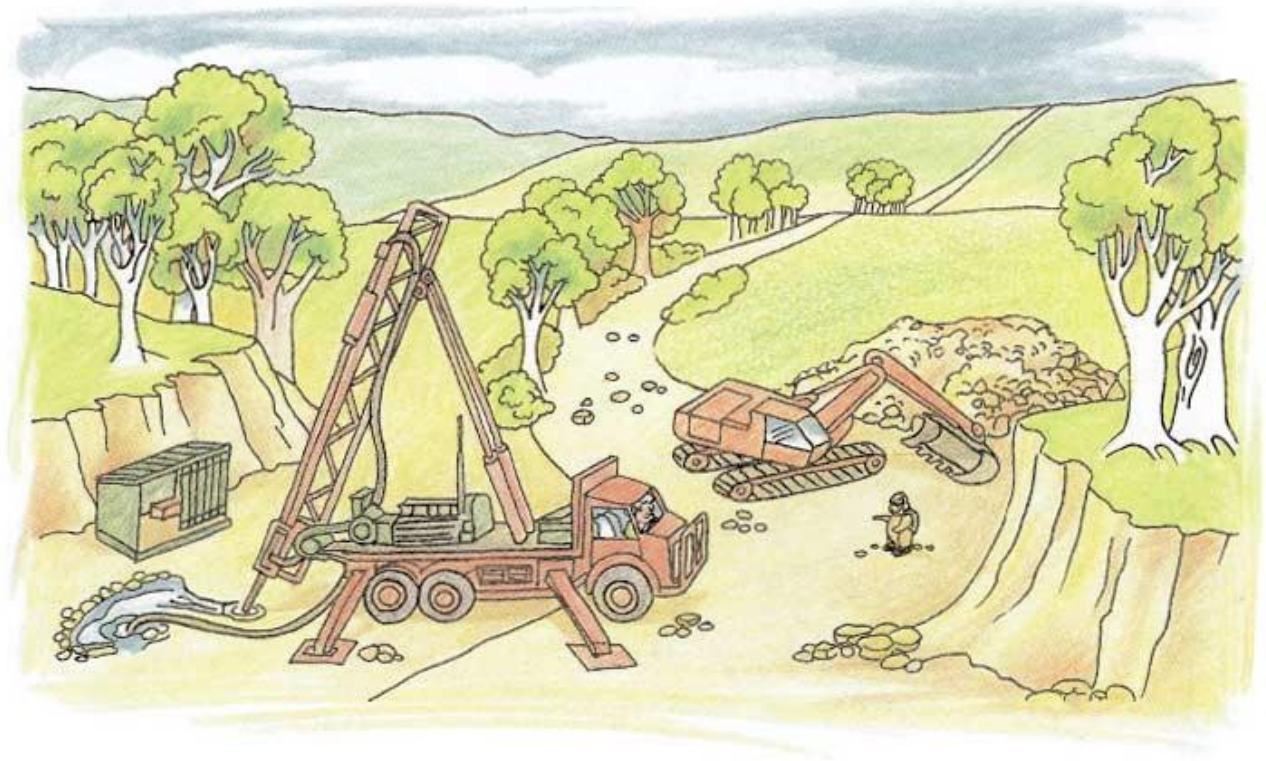
When exploration teams DRILL or dig to look for minerals, some of the land may be disturbed. They may have to build tracks, dig holes and clear parts of the bush, but...



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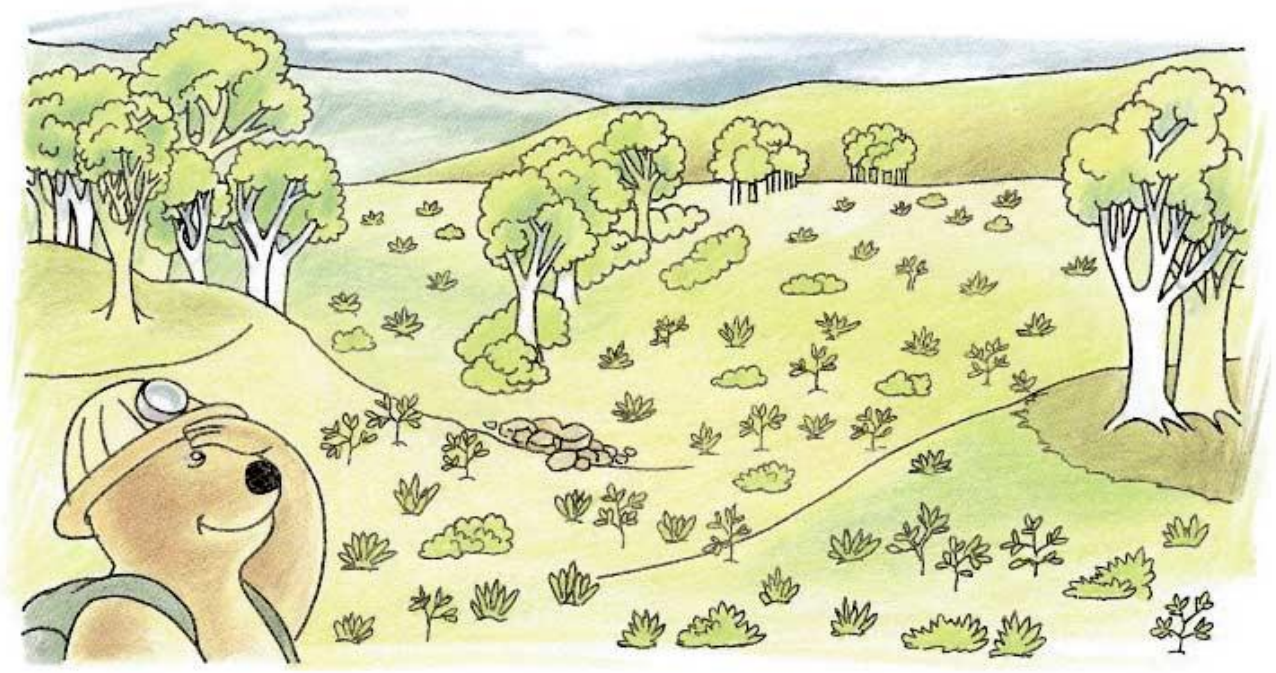
...when they finish they work to put the land back to how it was before. They fill in the holes and put back the soil. They plant trees and bushes.



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When a lot of minerals or coal are found in the ground, miners may decide to dig them up. To do this they will build a mine.

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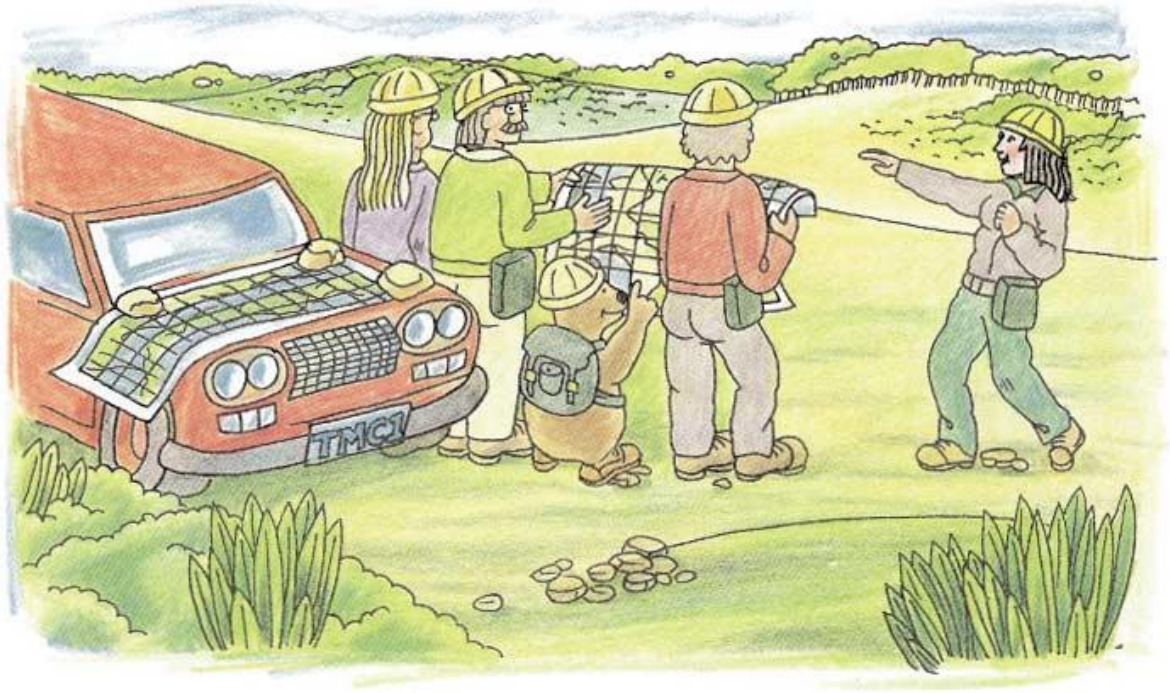
ENVIRONMENTAL SCIENTISTS have a special job to look after the land.

Before a mine is built, they plan how to look after the land while mining takes place and then how to fix it when the mine has closed.



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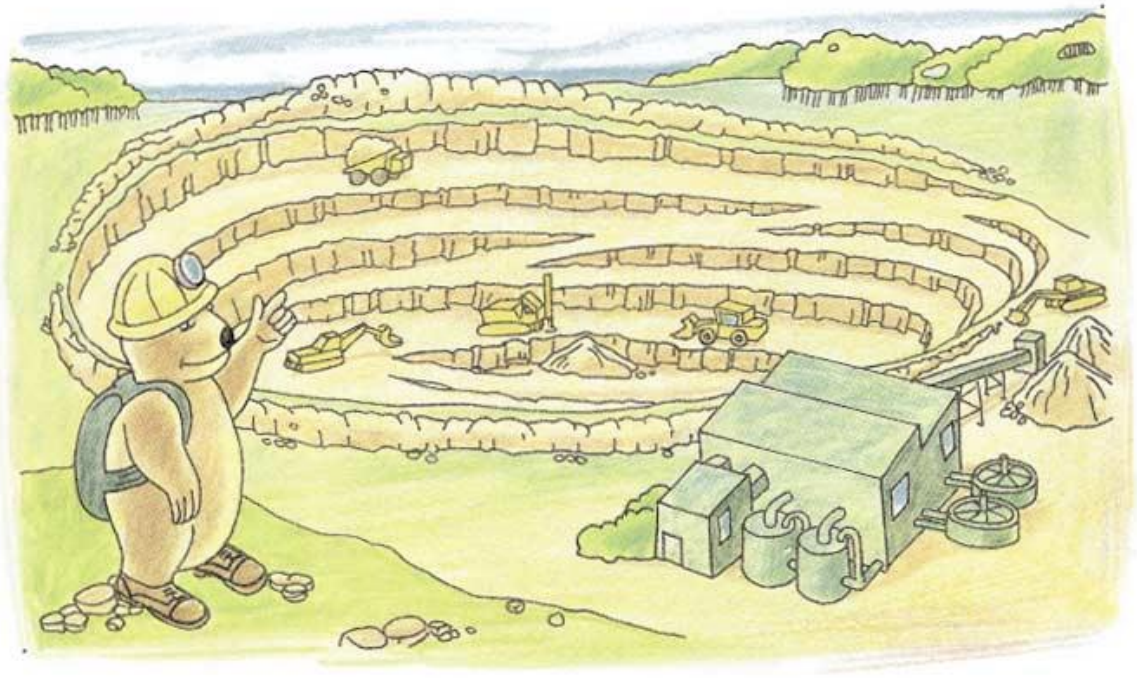
If the minerals are close to the surface, an OPEN CUT mine is dug.

The mine is called a PIT. It may be very big. When mining is finished it is hard to fix the land that has been changed into a pit.

Sometimes a pit may be filled with water to make a lake.



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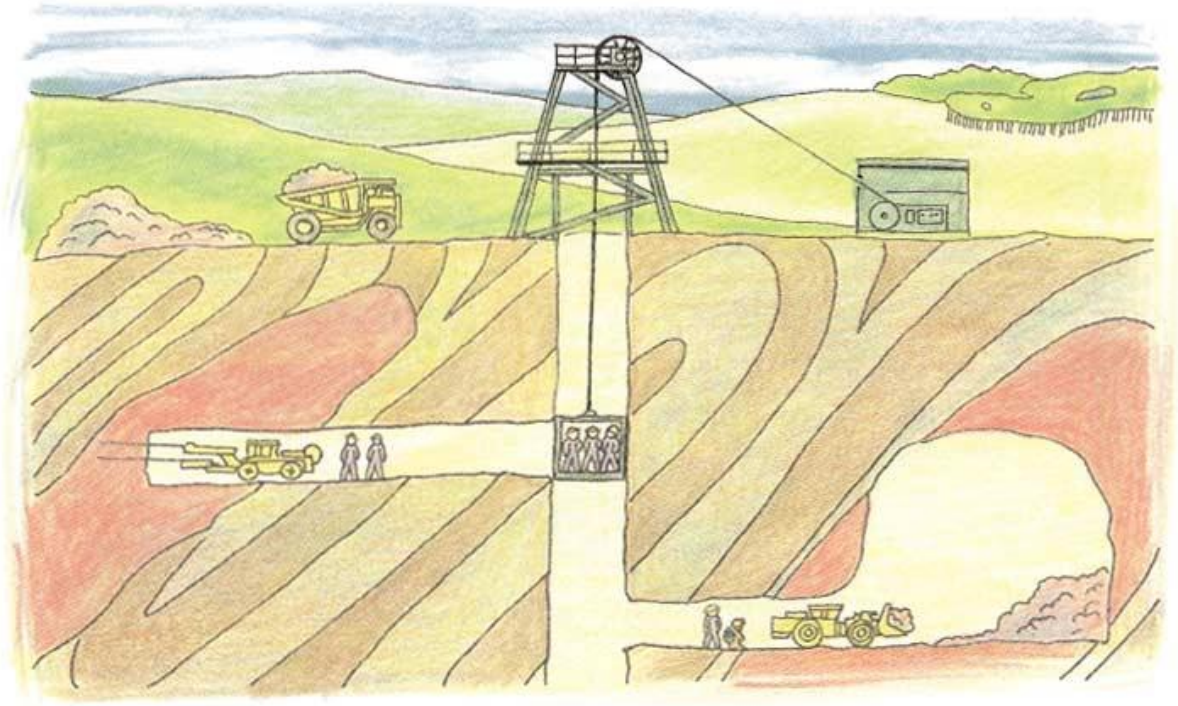
If the minerals are not near the surface an underground mine is dug.

In some mines, the miners and machines go underground in a CAGE.

It goes up and down a deep hole, called a SHAFT. Inside a mine there are many tunnels and large spaces for miners to work in.



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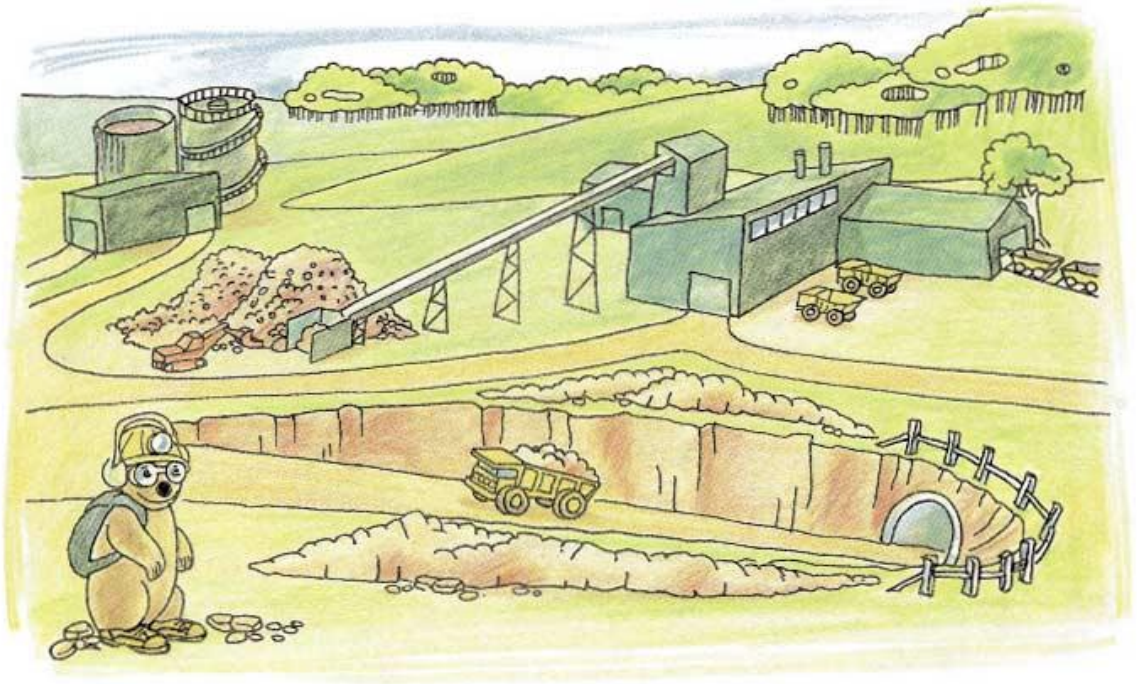
Miners in their large machines sometimes drive down a long sloping tunnel, called a DECLINE. The rocks which contain the minerals are called ORE.

Trucks carry loads of ore to a special factory, called a MILL.

In the mill the minerals are separated from waste rock.



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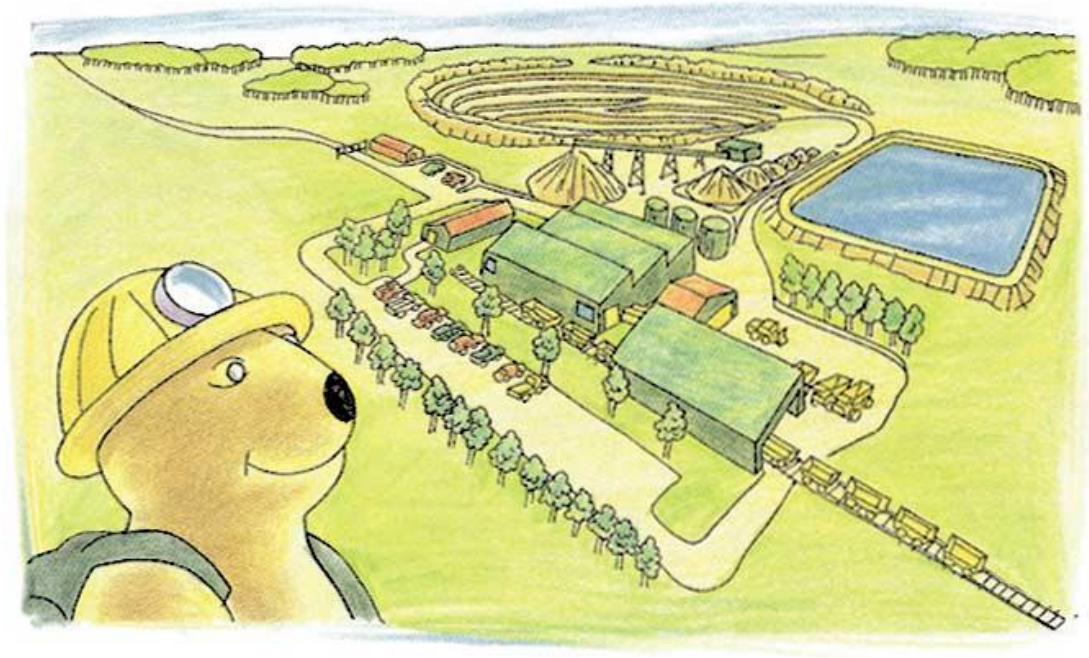
Roads go to mines. Land is cleared for car parks and buildings.

Dams are made to hold water and waste from the mine and mill.

Sometimes railways are built to take the minerals away.



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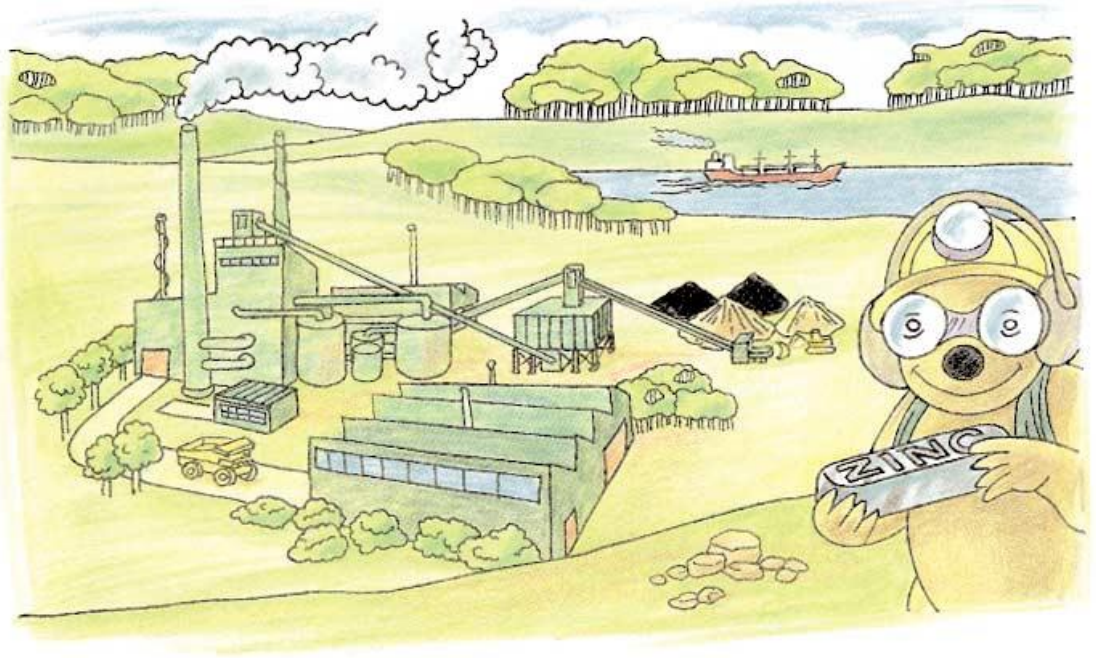
The minerals are taken from the mill to a special factory called a SMELTER.

From the minerals, smelters produce metals that we use every day.



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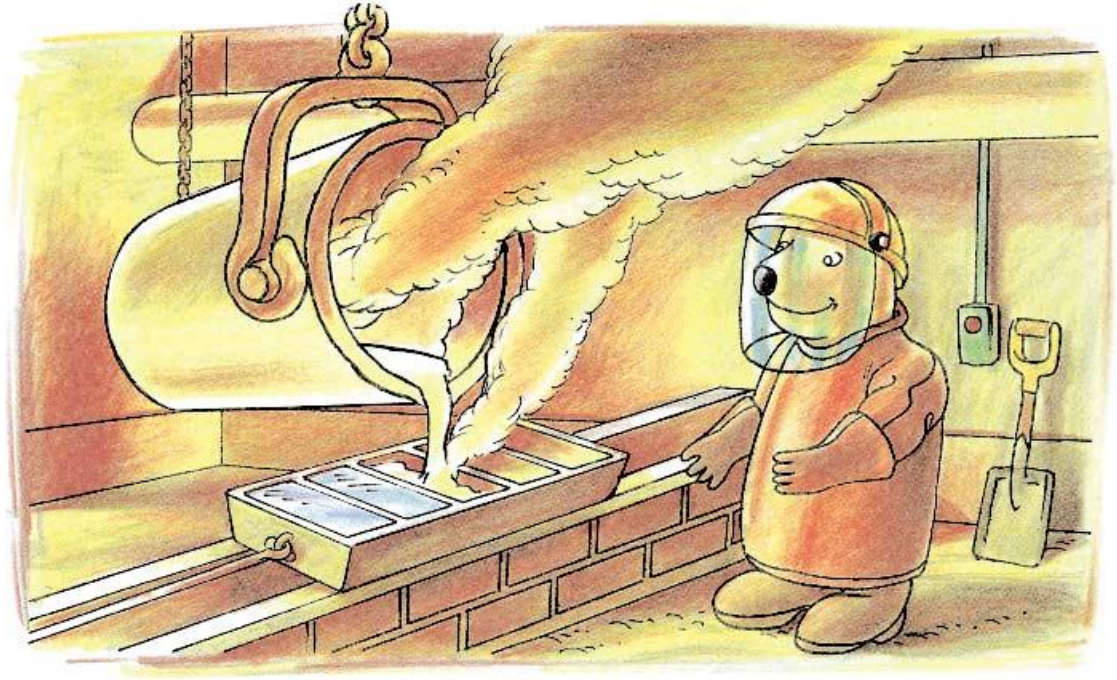
Smelters use lots of energy to make the metals from the minerals.

The energy comes from electricity, coal, oil or natural gas.

Often the minerals are melted to make molten metal.



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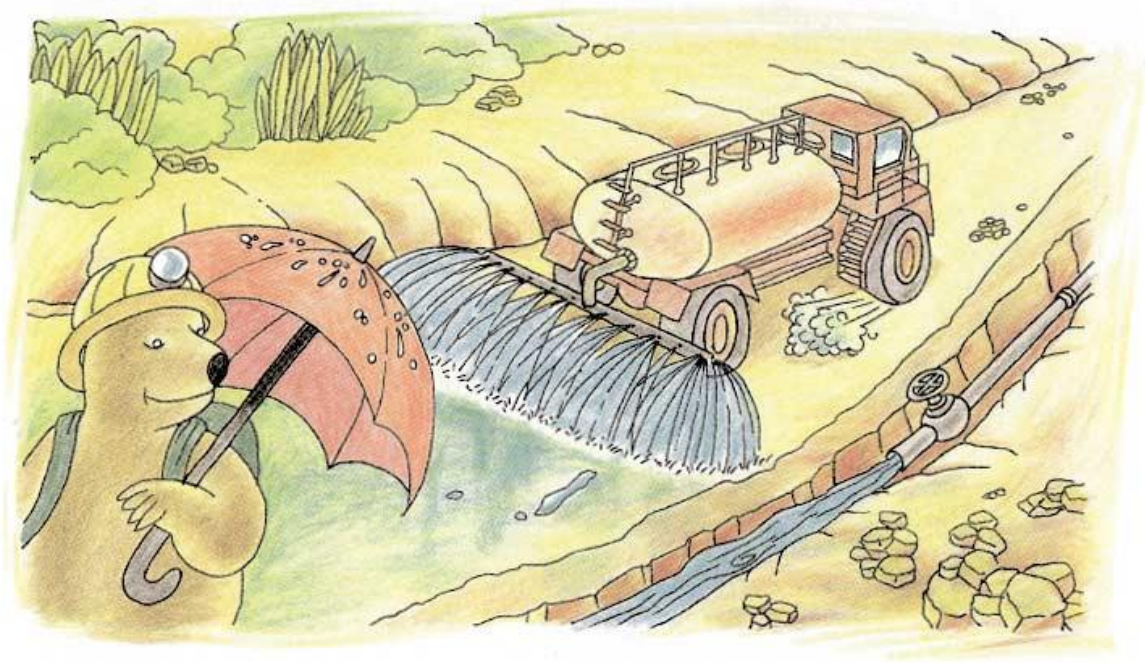
Miners use a lot of water. It is used to separate the minerals from

waste rock after the ore has been crushed. Water is sprayed onto roads

to stop the dust caused by large machines.



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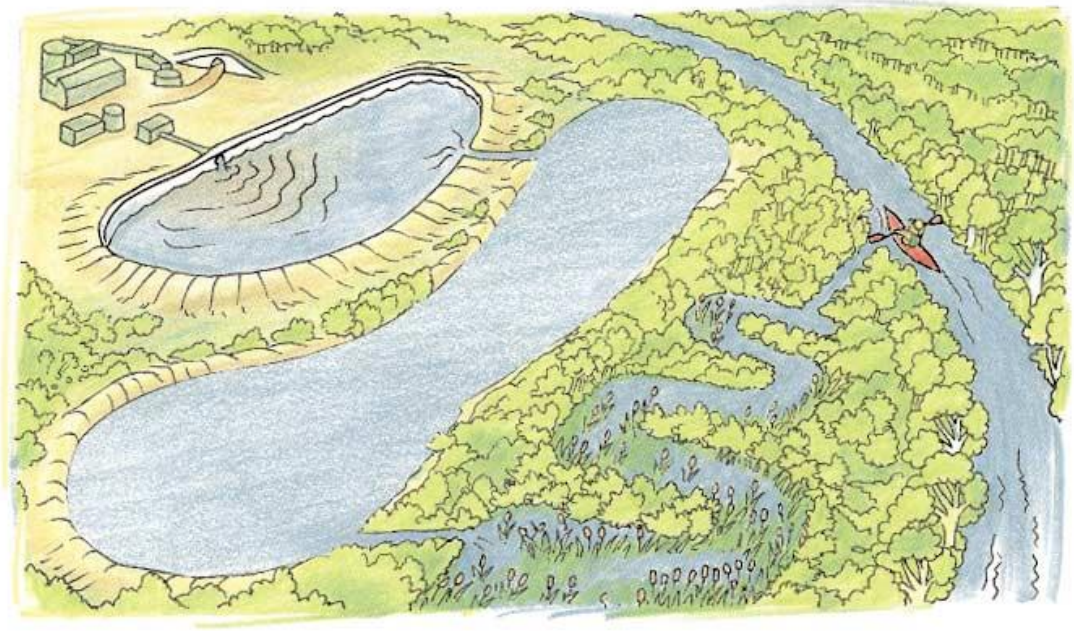
Water in the streams near a mine has to stay clean and fresh. Dirty water from mines and smelters is pumped into SETTLING PONDS.

It may flow through WETLANDS where plants are used to clean it. The cleaned water may be re-used in the mine or smelter, or returned to the stream.



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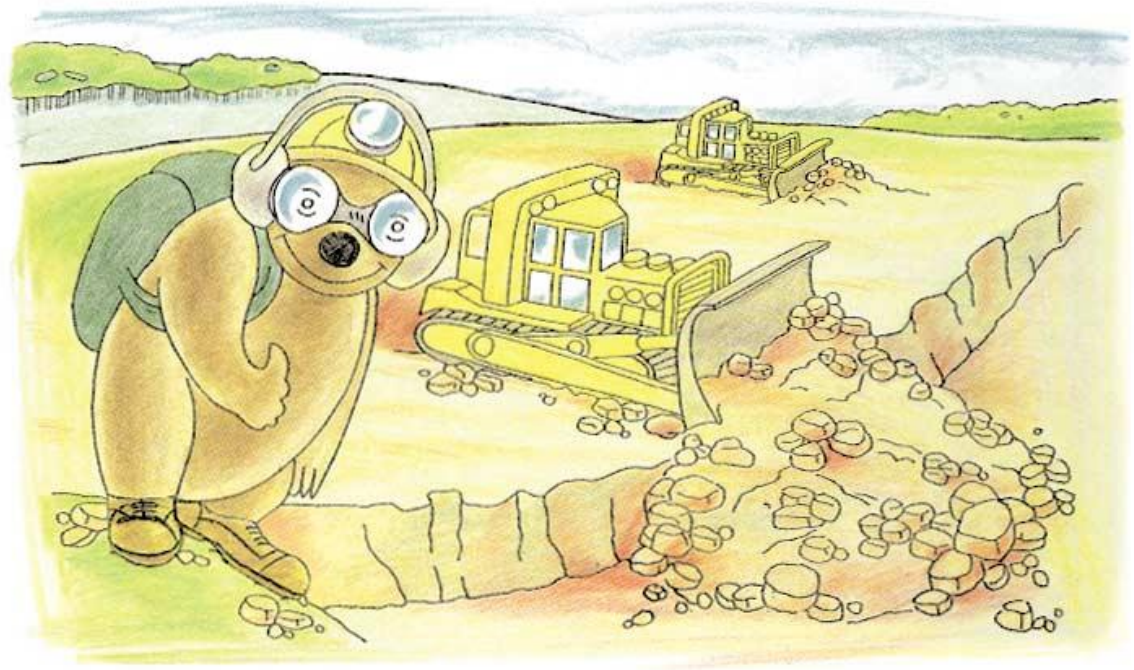
When all the minerals have been removed, the mine will close.

The machines and buildings are taken away. The land is covered with soil.

Plants are grown. Native animals return to live in the new environment.



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For a long time after the mine has closed environmental scientists check the area. They see if the land is starting to look like it was before the mine. As time passes it may be hard to see that a mine was ever there.

Teacher or parent guide

Activity – Mining, Smelting or Environmental

Contact your state minerals council or chamber or a local company operation and borrow a resource (e.g. video, slides, CD, learning kit) which shows a particular environmental activity,
and/or
Organise an excursion to a local mining, smelting or environmental operation. Contact your local minerals association for details or contact a company direct.
Company personnel may be available to come into the classroom and talk to students.
At the end of the excursion and/or video presentation ask the children to:

1. discuss what they have seen
2. list the operations seen or shown, in order
3. name and list equipment or other materials used in each operation.

Activity – Design a rehabilitation program for a hypothetical mine or quarry (individual or group activity)

1. Distribute a top view of a mine site (diagram or image), as though viewed from a plane.
2. Describe the operation that has taken place (present photos, slides or video).
3. Ask the children to decide what is to become of the site (e.g. back to natural habitat, water storage, refuse tip, playground, recreational lake, tree plantation).
4. The children then draw what they think should be there (a plan) and explain why. Introduce symbols and talk about a key (and scale). What does each symbol mean?
5. Construct (maybe) a model of the site.

Materials and equipment for this activity include drawing paper, pencils, crayons, felt pens, rulers, glue. Recycled materials (e.g. papier-mâché, sponge, moss and tissue paper for trees, matches, cardboard, cotton wool, etc.) are suitable for model making.

Activity – Rehabilitate a site at school (group activity)

1. Identify a disturbed or degraded site in the school grounds (or in the classroom).
2. Develop a plan to show what may be done to improve the site environment.
3. Obtain the necessary permission to undertake site improvements. (It may be necessary to argue a case for the planned activity.)
4. Carry out the rehabilitation and evaluate the results.

Activities note

Materials and equipment depend on the nature of the activity. Native seed or plants may be obtained from a local forest industry association or company, or a commercial nursery. Children may germinate seeds into seedlings.

About this publication

This publication is one of a set of four booklets: “A Mine”, “Finding minerals”, “Mine Machines” and “When We Mine”.

The publications are produced in Tasmania for the MINERALS COUNCIL OF AUSTRALIA.

The booklets are designed for use from Kindergarten to Year 4 (and beyond) and to assist student literacy, while at the same time exposing children to aspects of our mining industry.

Original concepts and drawings: Ron Bugg (Education Manager, TASMANIAN MINERALS COUNCIL) in consultation with K-4 teachers and curriculum consultants Australia wide.

Design and Artwork: EVERY ONE AN ORIGINAL, Hobart, Tasmania.