



# Mine Machines

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.

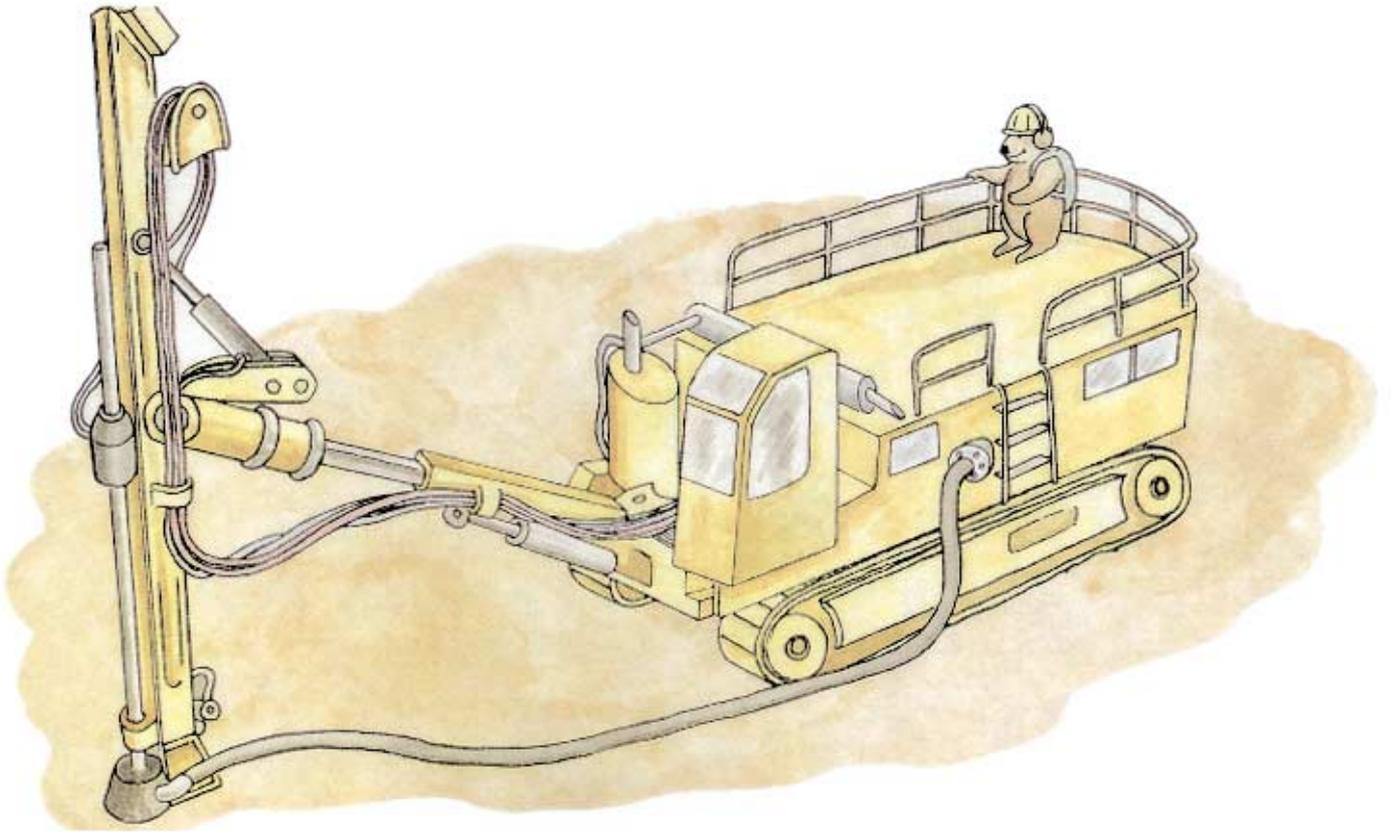
Original concepts and drawings: Ron Bugg (Education Manager, TASMANIAN MINERALS COUNCIL) in consultation with K-4 teachers and curriculum consultants Australia wide.

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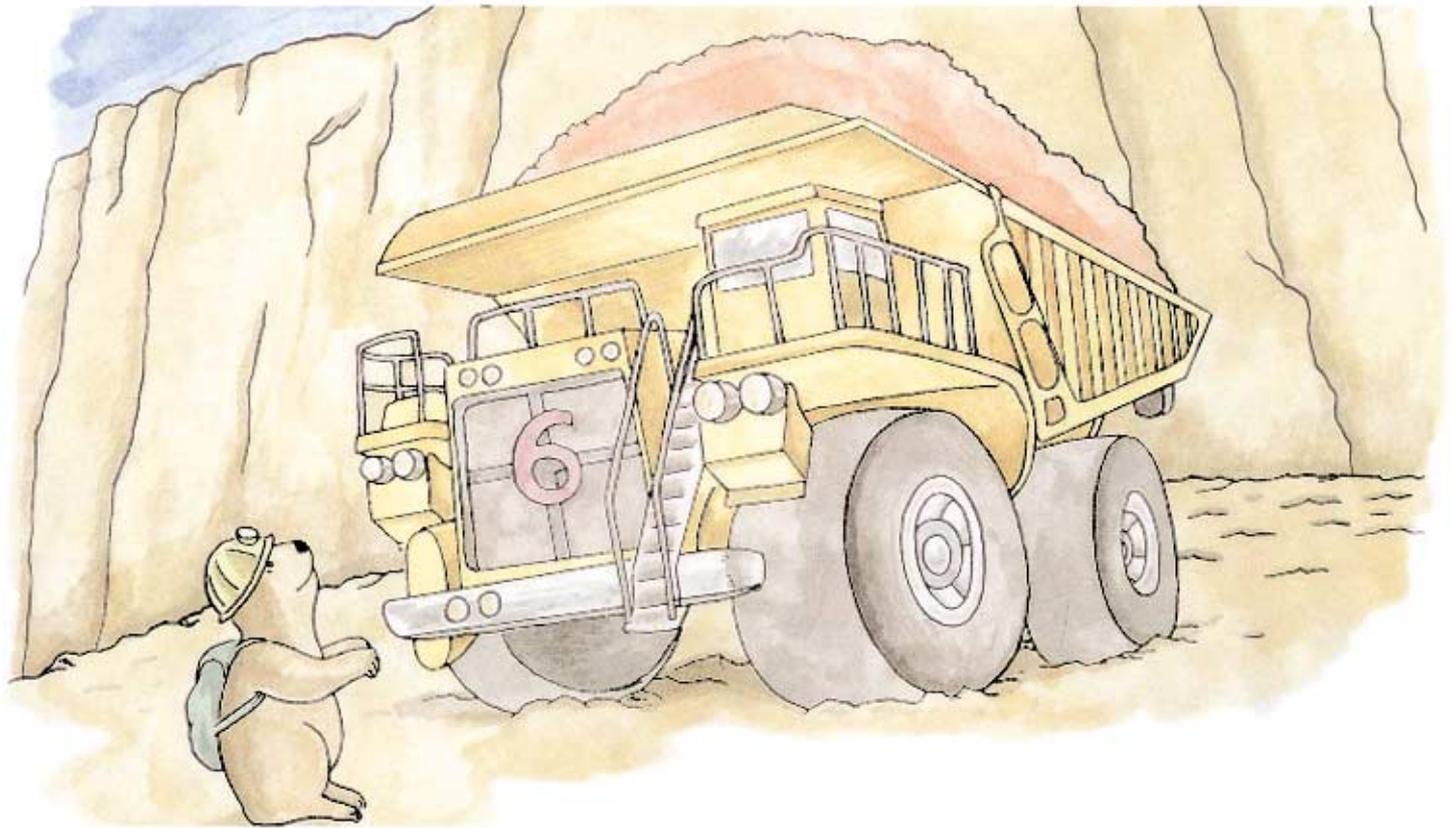
## Track Drill

A track drill is used to drill holes downwards into the ore in an open cut mine. The drill holes are filled with explosive and the ore is blasted. It is broken into small pieces to make it easy to load.



## Electric Shovel

An electric shovel is used in an open cut mine to pick up and load large amounts of ore onto the trucks. It has a large bucket which digs the broken ore.



## Haul Truck

Open cut mines make big holes in the ground. The haul trucks which carry ore out of open cut mines are very big. The trucks carry very large loads of ore. The driver needs a ladder to climb up to the cab.



## Headframe

A headframe is built over an underground mine shaft. Wires move a lift up and down in the shaft. Miners travel in the lift. Sometimes ore is carried from deep in the mine up the shaft in the lift.



## Jumbo Drill

A jumbo drill uses two rock drills at a time to drill many holes in the end of a tunnel. The holes are filled with explosive and blasted. The ore is broken up and is removed. The tunnel is made longer.



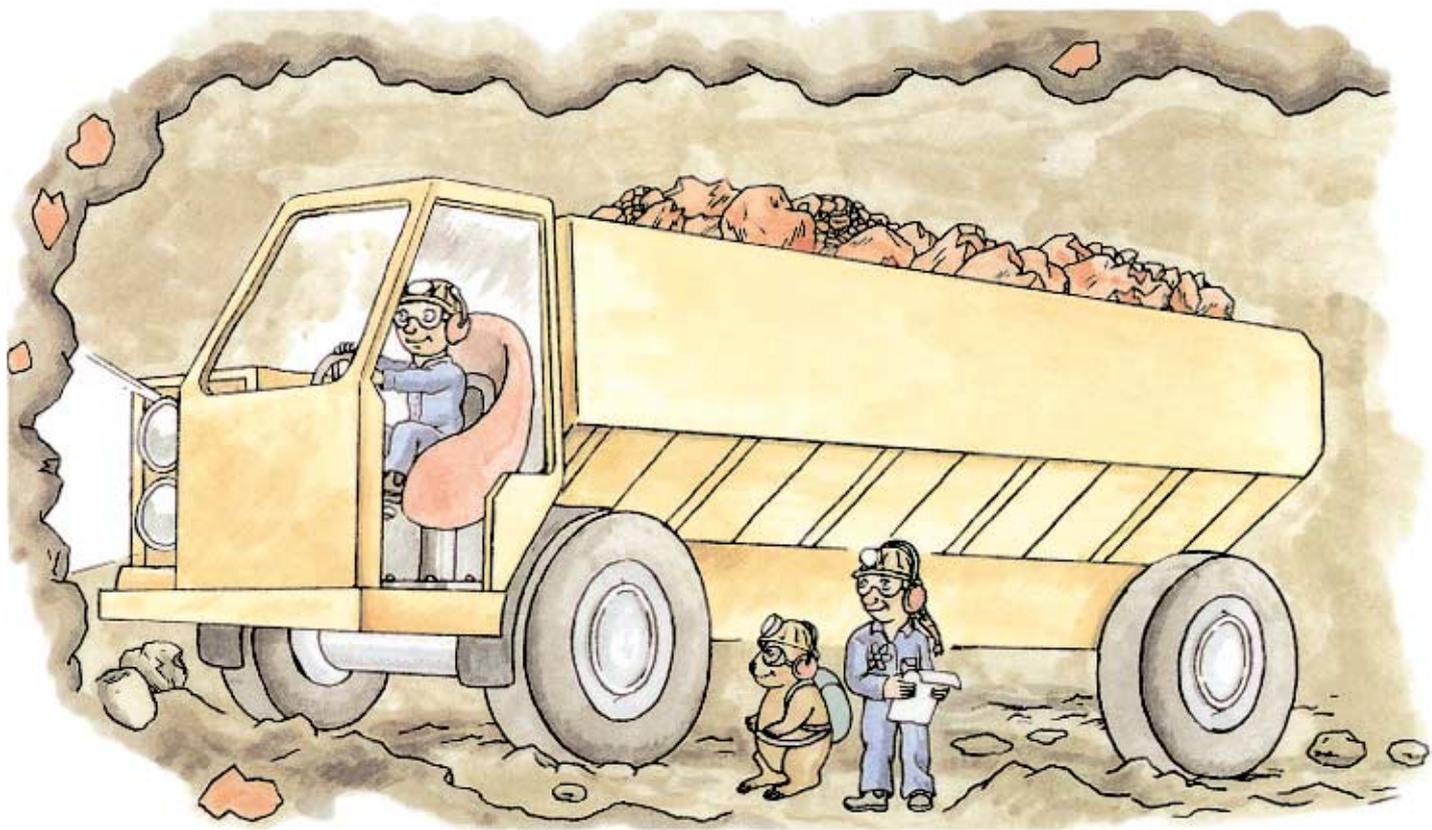
## Air-leg Drill

In some parts of an underground mine which are hard to get machines into, miners use air-leg drills. An air-leg drill is like a jackhammer on one leg. It uses compressed air to operate.



## Load-Haul-Dump

A load-haul-dump is a special loader that picks up the broken ore in a large bucket at the front. If it is working in a dangerous part of the mine the driver can get out of the loader and use remote control to drive it.



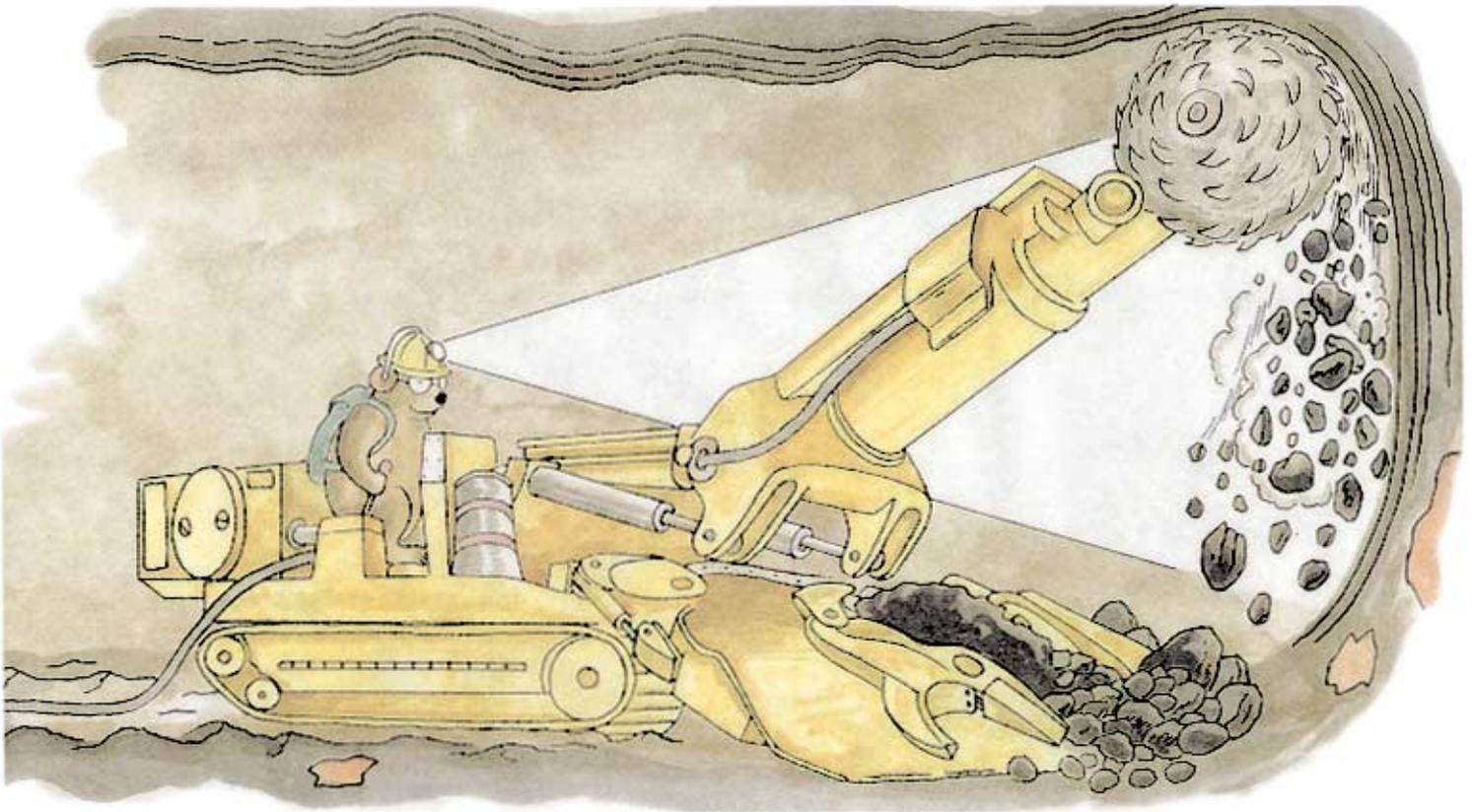
## Haul Truck

There is hardly any space in underground mines. A haul truck is specially made to work in tunnels in underground mines. Haul trucks carry large loads of ore to the surface.



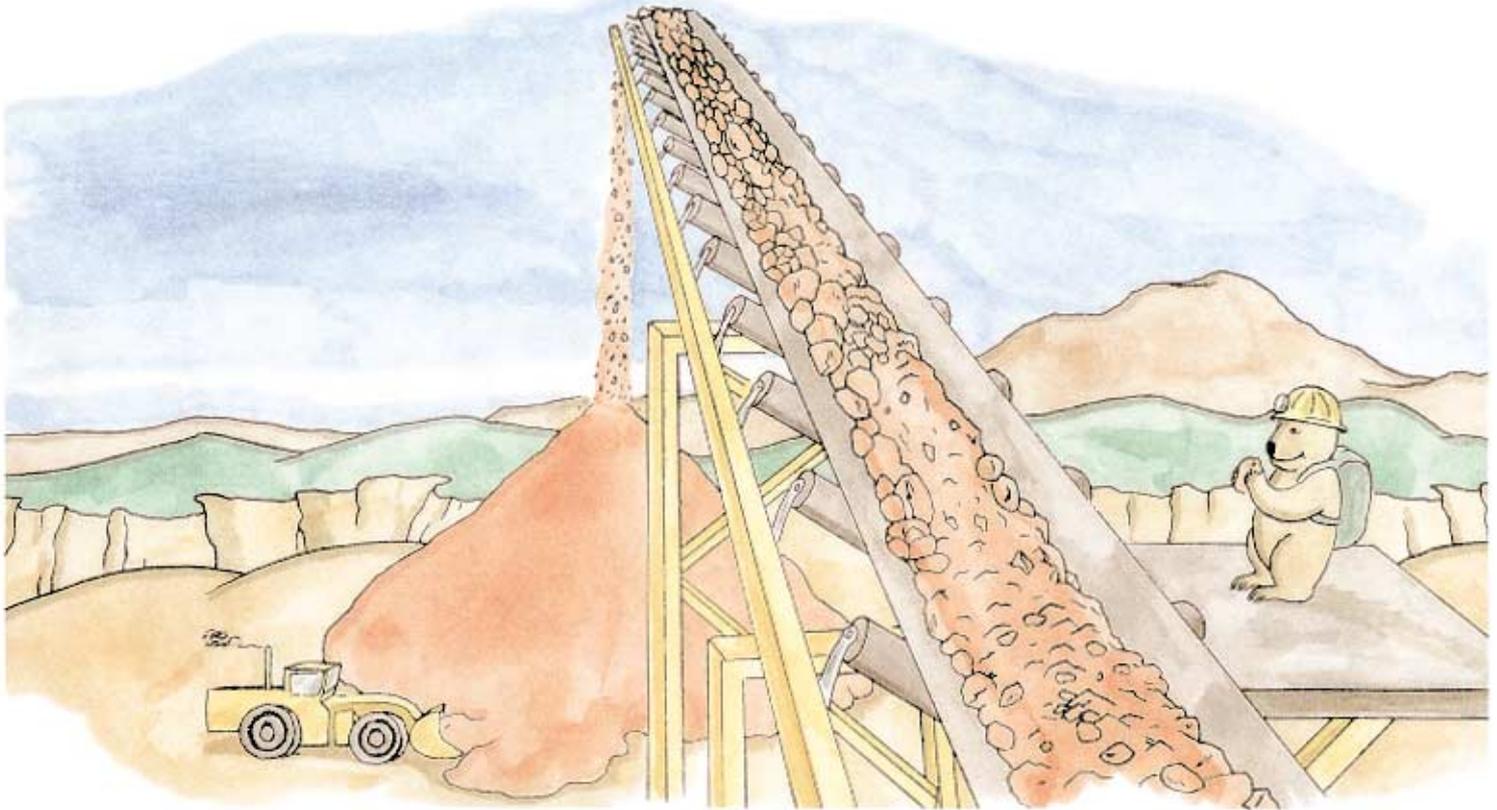
## Loading Ore

The load-haul-dump shovels up the ore and loads it onto a waiting haul truck, which takes the ore to the surface to be processed.



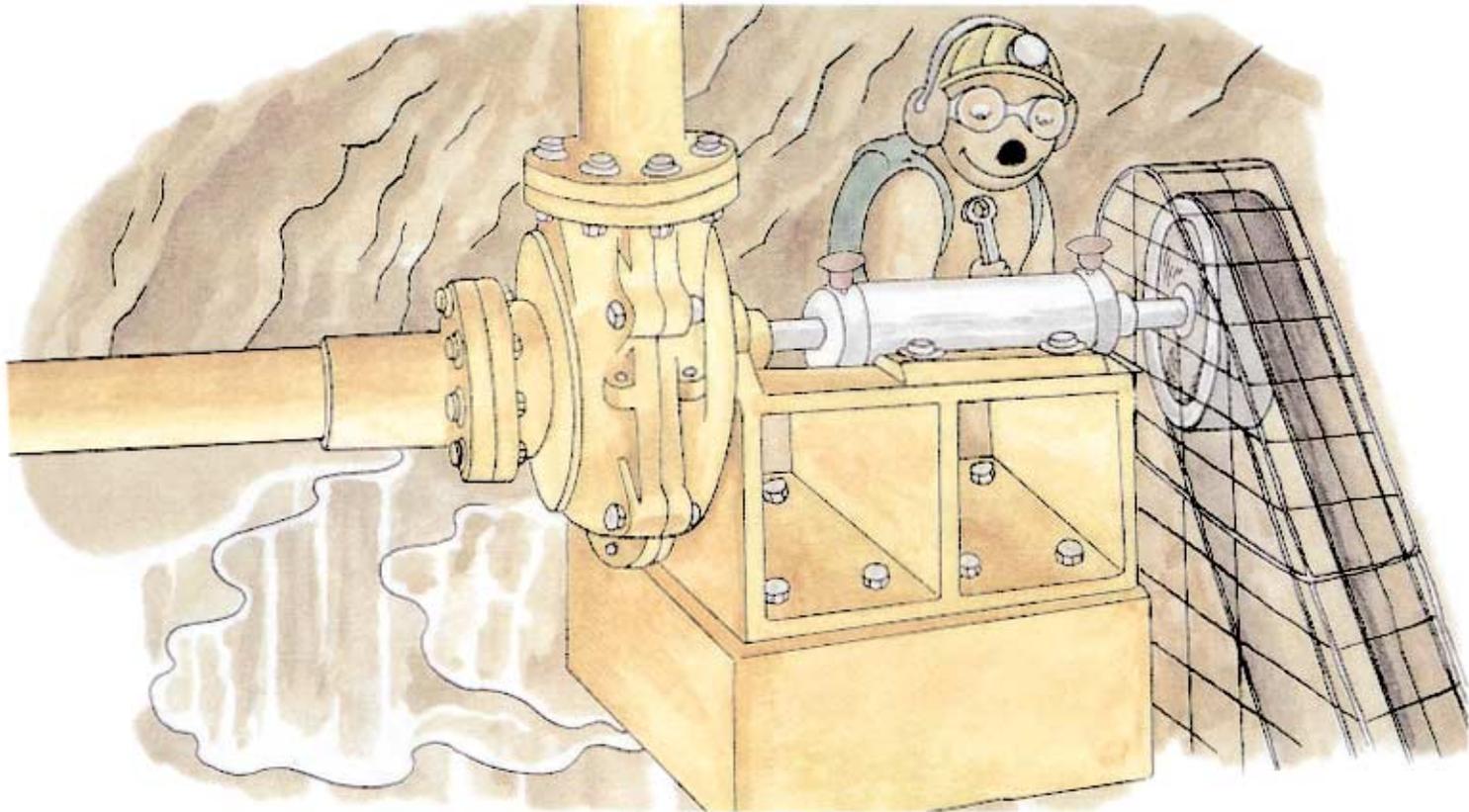
## Continuous Miner

A continuous miner is used in coal mines to cut coal from a coal seam in the ground. The broken coal is loaded onto a conveyor belt or truck to take it out of the mine.



## Conveyor Belt

Conveyor belts are used to transport crushed ore from one part of a mine to another. The ore is stored in a stockpile, ready to be carried somewhere else to be treated.



## Pump

Pumps are very common in all mines. They are used to pump water out of mines so that the miners and their machines stay dry while they work.

Pumps are also used to pump water to different parts of the mine.

# Teacher or parent guide

Several activities may be used along with, or to supplement this booklet.

## **Activity – Mineral Operations**

Contact your local minerals council or a local mining company and borrow a videotape which shows a mining operation,

**and/or**

Organise an excursion to a local mining or quarry operation. Contact your local minerals association for details or phone a mine or quarry direct.

At the end of the excursion and/or video presentation ask the children to:

- (i) discuss what they have seen
- (ii) list the operations seen or shown in order
- (iii) name and list the machines used in each operation

## **Activity – Make a model mine machine**

**(Individual or group activity)**

- (i) Make a mine machine from cardboard boxes and other discarded materials.

- (ii) Ask the children to design and make a two-dimensional working silhouette of a machine which has a particular role in a mining operation (e.g. a machine that will load broken ore; a machine that will carry ore; a machine that will remove loose rock from tunnel ceilings; a machine that will crush large boulders into gravel; a machine that will sort gravel into different sizes). If made small enough, the final products can be demonstrated on an overhead projector.

Materials and equipment for this activity include cardboard, drawing pins, paper clips, sticky tape, string, scissors, hole punch, paper glue.

## **Activity – Design a machine**

**(Individual or group activity)**

Ask the children to design a machine which has a particular function (e.g. an all terrain rescue vehicle, a motorised mobile pump vehicle, a mobile machine for crushing rock on site, a machine which separates heavy minerals from light, etc.). Make drawings and write an explanation of the design.