

## Extraction of rocks and minerals

### 1. Fill in the gaps to complete the definitions of minerals

chemical - composition - crystal - solid - inorganic - internal - naturally - structure

Minerals: \_\_\_\_\_ occurring \_\_\_\_\_ substances with a specific \_\_\_\_\_ and an ordered \_\_\_\_\_.

### 2. Match each concept with its definition:

Reserve

A known source of mineral, which has not yet been mined but can be mined in the future when needed.

Life expectancy of a mineral

All minerals in the ore which have no economic value.

Peak mineral

Date after which there will only be less extraction of mineral.

Ore

Mineral processing plant discard that contains mainly gangue minerals in addition to some valuable minerals.

Gangue

Natural accumulation of minerals that has an economic value for mining and processing; composition of several minerals (valuable and gangue).

Tailings

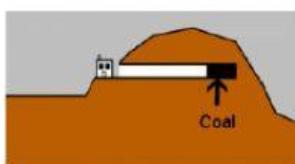
Number of years reserves are expected to last at present rates of use. It is calculated by dividing the amount of reserves known to exist with the amount used each year.

Overburden

Rock and soil overlying and economically viable mineral deposit.

### 3. Look at the pictures and name the correct type of mining. Drag the tag under each picture.

Strip mining



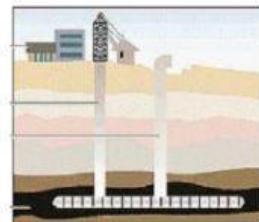
Open pit mining



Shaft mining



Drift mining



**4. Match the type of mining to its definition**

Surface mining	It involves digging into the ground to reach mineral deposits that are too deep to be removed otherwise.
Subsurface mining	This is used when a valuable deposit is located near the surface, often buried below a thick layer of worthless material.

**5. Put the stages in each type of mining in the correct order**

**a) Surface mining (open-cast, open-pit, open-cut or strip mining)**

- Breaking up and loosening the rock by using explosives.
- Clearing the vegetation
- Tipping the rock or mineral into trucks or railway wagons.
- Using diggers to remove the loose rock.
- Removing spoil and overburden rock and storing in heaps.

**b) Subsurface mining (deep mining or shaft mining)**

- Bringing the loose rock from the mine and piling it up on waste heaps on the surface.
- Bringing the mineral to the surface, to be transported away in trucks or trains.
- Sinking a vertical shaft down the rock layer containing minerals.
- Extracting the minerals by digging done by miners or machines.
- Making a horizontal tunnel following the mineral layer

**6. Decide if the following statements are advantages or disadvantages of surface or subsurface mining.**

- a. Cheaper.
- b. Easier access to materials.
- c. Fewer workers needed.
- d. It causes a lot of dust and noise pollution.
- e. It looks unsightly.
- f. It produces large amount of waste rock (spoil).
- g. It produces waste heaps.
- h. It reaches minerals not accessible by other methods.
- i. Large areas of land damaged.

- j. Large size of mines allows easy access of machines and workers.
- k. Less impact on the surface ecosystem.
- l. Majority of overburden left in place.
- m. More dangerous for the workers that might not be able to escape as exit routes may be blocked.
- n. More expensive.
- o. More technically complex.
- p. Risk of flooding.
- q. Risk of poisonous gases, underground fires and explosions.
- r. Risk of tunnel/shaft collapse.
- s. Safer for workers.