

## Rocks 1

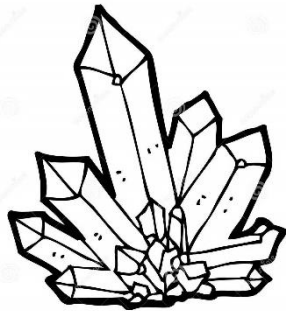
### What are rocks made of?

Rocks are made up of different minerals. Minerals are part of God's creation. They are found in the ground. You will know some of them: silver, gold, iron, aluminium and silicon. Silicon is the mineral that sand is made from.

Some rocks are made from crystals. Crystals form when the mineral particles are arranged in repeated patterns. The particles can be coloured. Gemstones are made of coloured crystals. These are very valuable.

To see them sparkle and shine they have to be cut and polished. Here are some examples of gemstones. You may have even seen one in someone's jewellery... diamonds (clear), rubies (red), sapphires (blue), emeralds (green).

1. What are rocks made from?
2. Draw a crystal.
3. Draw some gemstones, label and colour them the right colour.



crystals

## Rocks 2

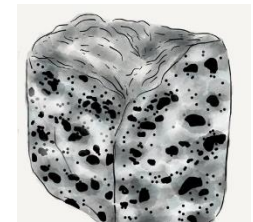
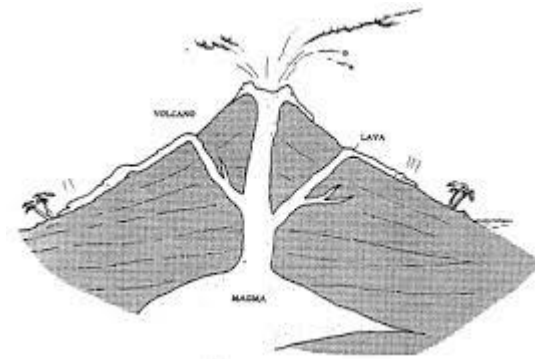
### Types of rocks: Igneous

There are three types of rocks: Igneous, Metamorphic and Sedimentary.

#### Igneous Rocks

This type of rock is formed from the lava of a volcano. Deep inside the earth, rocks are melted and become magma. When magma comes out of a volcano it is called lava. When the lava cools down, it forms igneous rock. If the lava cools quickly, the rocks will look smooth and shiny. But if the lava cools slowly, the rocks will have plenty of texture, gas bubbles, tiny holes and spaces. These rocks are hard.

Examples: granite, basalt



1. How are igneous rocks formed?
2. Why are there often holes in igneous rocks?

## Rocks 3

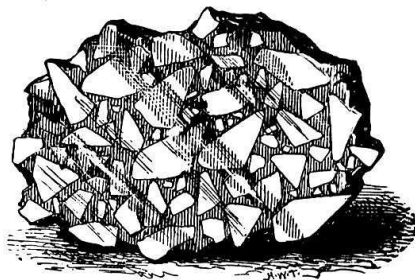
### Types of rocks: Metamorphic

There are three types of rocks: Igneous, Metamorphic and Sedimentary

#### Metamorphic Rocks

These rocks form beneath the surface of the earth. They form from intense heat and pressure. They have ribbon-like layers. Some of them have shiny crystals on their surface. They have been changed by the heat and pressure, sometimes splitting into many layers that look like a stack of pancakes with different mineral grains running through the rock. These rocks are hard.

Examples: quartz, marble



1. What are quartz and marble made from?
2. How are metamorphic rocks formed?
3. Find out how marble is used.

## Rocks 4

### Types of rocks: Sedimentary

There are three types of rocks: Igneous, Metamorphic and Sedimentary

#### Sedimentary Rocks

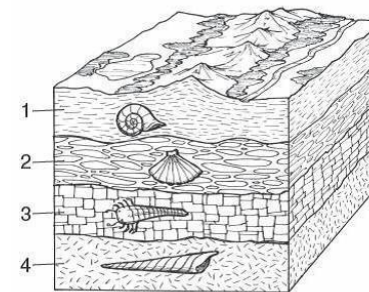
These rocks form beneath the surface of the earth. They form from the intense heat and pressure. They have ribbon-like layers. Some of them have shiny crystals on their surface. They have been changed by the heat and pressure, sometimes splitting into many layers that look like a stack of pancakes with different mineral grains running through the rock. These rocks are hard. Fossils are often found in sedimentary rocks.

Examples:

Sandstone (a rock made of sand cemented together)

Shale (compressed hard mud)

Limestone (made from layers of sediment which is soft when in water but becomes hard when out of water)



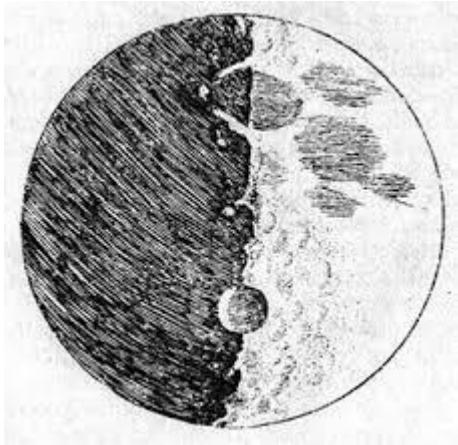
1. How are sedimentary rocks formed?
2. What do sedimentary rocks look like?

## Rocks 5 Meteorites

Meteorites are chunks of rock that fly onto the earth from space. Most meteorites are burned up by our atmosphere, but some still make it through as small rocks.

### Craters on the moon

If you look at the moon you will see darker areas. Those are actually huge craters from the impact of meteors. The moon does not have an atmosphere to protect it like the earth does. Large meteors can do a lot of damaged because of the fast speed at which they travel through space.



1. How were the craters on the moon made?
2. Why doesn't the earth get hit by large meteors?

## Rocks 6 The age of rocks

It is not always possible to tell how old rocks are because no one was there to see certain rocks formed.

When there is a volcanic eruption, rocks called "igneous rocks" will form from the lava when it cools. If we see a volcanic eruption, we can go and look at the rocks formed around the volcano when they cool. We know how old these rocks are because we have just seen the volcano erupt. But that doesn't mean we know the age of every rock in the world.

Many scientists think that rock layers took millions of years to be laid down. But because the scientists were not there to see the formation of the layers they can only guess.

We know from the Bible that many layers of mud were laid down very quickly during the Great Flood. Many sedimentary rocks were formed at this time, about 4,000 years ago. Sedimentary rocks are rocks that have formed through layers of mud or dirt. Many of these rock layers contain fossils because during the Great Flood many animals died and were buried quickly in the mud layers. These rocks did not take millions of years to form. So when you hear someone say that a rock is millions of years old, remember that this cannot be proven. According to the Bible the earth is thousands of years old, not millions.

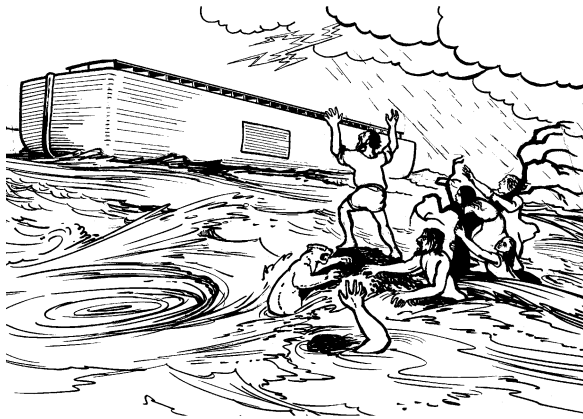
1. When did most fossils form?
2. What do we find them in?

## Rocks 7

### Sediment becomes hard rock

The earth's crust moved a lot during the Great Flood. Volcanoes were exploding. Fountains of water were gushing out of the earth. Rocks bumped into each other and broke into smaller pieces. All this made a lot of muddy water. The mud was carried along quickly by strong Flood currents and settled as sediment when the Flood waters slowed down. The sediments settled in layers.

Sediments become hard rock when they are squeezed together by pressure. During the Flood, the weight of each new layer of sediment increased the pressure and squeezed the sediments together. They were cemented together by silica and limestone which dissolved in the water during the Great Flood.



1. What is the "earth's crust"?
2. What happened to the mud and rocks during the Great Flood?
3. Which two minerals can act as cement?

## Rocks 8

### Limestone Caves

Limestone caves are found in limestone rock. Many of these caves have large rooms are exciting places to explore. Rivers and streams sometimes run through passage ways. Stalactites hang from the ceiling. (They hold 'tight' to the ceiling.) Stalagmites rise up from the cave floor. They often look like cones. They are formed by dripping water that is loaded with dissolved limestone. The limestone hardens and forms beautiful and colourful shapes. Chalk is made from limestone.

1. Draw a picture of a limestone cave and label the stalactites and stalagmites. Use colours: yellow, orange, brown, white and grey.
2. Look at the picture below. What do we call it when a stalactite and stalagmite join?
3. Write three facts about limestone.

