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Chapter 1

Rocks and Creation



In the beginning, God created the heavens and the earth. On Day 1, He created light. Then on Day 2, the atmosphere and space were made. Day 3 was the time God made the dry land and plants. The sun, moon, and stars were formed on Day 4. God made the birds and sea animals on Day 5. Finally, on Day 6 God created the animals and man, and finished His work on Day 7.

During Creation Week He also created Mr Hibb along with all the other creatures that He made. Mr Hibb is a grasshopper—but not just any grasshopper. He was a very curious and amazing grasshopper. Because he loved his home, the earth, he wanted to understand more about God’s creative work.

Mr Hibb, like any young person, was curious about his surroundings. He was very interested in all sorts of rocks, and he often went to the river to collect his ‘treasures’. Often, Mr Hibb wondered what his rocks were made of.

Day 1 = light
Day 2 = atmosphere & space
Day 3 = dry land & plants
Day 4 = Sun, Moon & Stars
Day 5 = birds & sea animals
Day 6 = animals and man
Day 7 = rest



HANDS-ON ACTIVITY

Let's go rock collecting



Collect 30 small rocks. Pick the most unusual rocks you can. Choose rocks of different shapes; find some rounded and some with sharp edges. Save them for later for future activities.

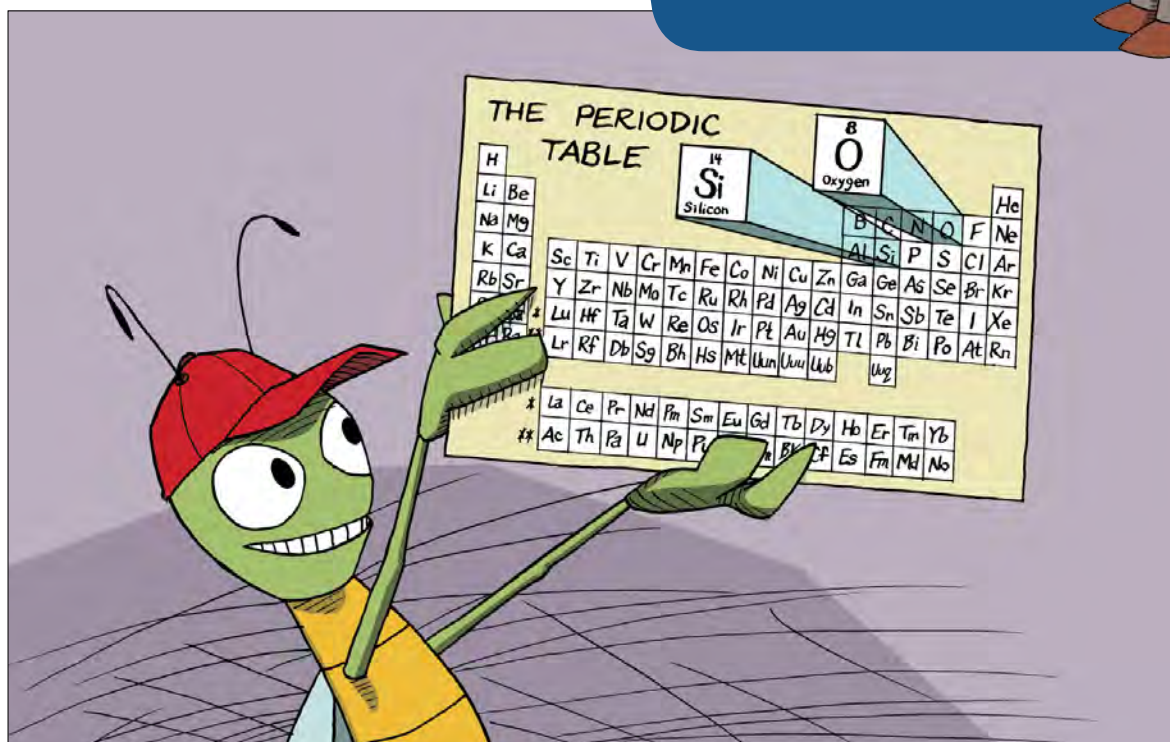
What you'll need

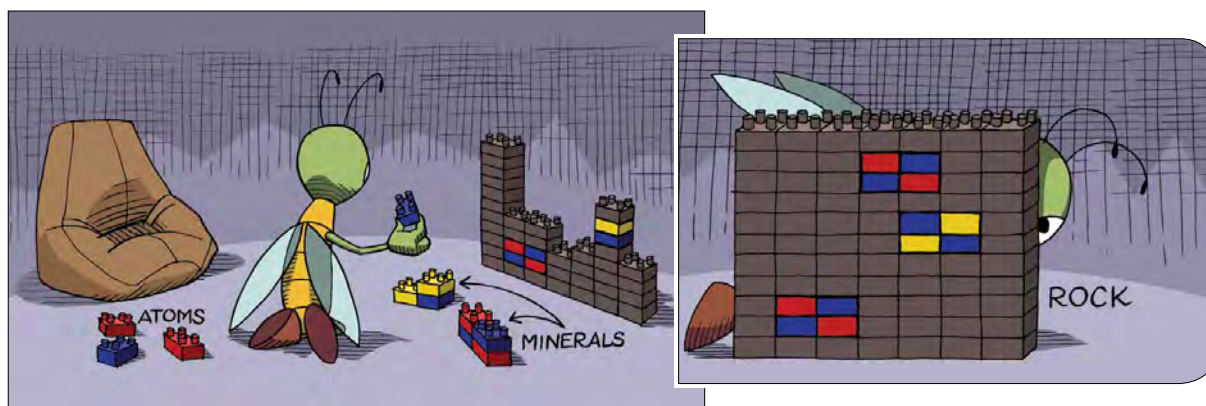
- 30 small rocks
- a box to keep the rocks in

Rocks are composed of a mixture of different minerals. Minerals are made of basic building blocks called atoms that are packed together in an exact arrangement. Atoms are very small building blocks that make up everything that exists in the world. We currently know of 118 different types of atoms. 92 are found in nature while the rest have been made artificially. Each type of atom is called an element. The periodic table is a chart that is used to organize all the different elements discovered so far.

OBSERVATION

Most of the earth is made up of just two types of atoms. Oxygen makes up about 50% of all the atoms. About 20% of the earth's atoms are silicon.

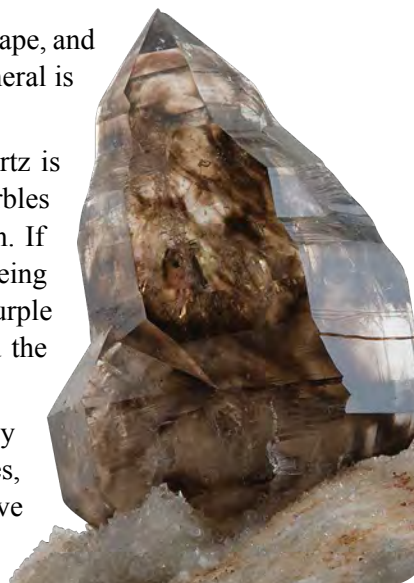




The minerals that compose rocks vary in hardness, weight, color, shape, and the way they break apart. When the arrangement of atoms in a mineral is repeated in the same way over and over again it forms a 'crystal'.

Some crystals are very common, like quartz, which is clear. Quartz is made up of only silicon and oxygen atoms packed together like marbles in a jar. There is one silicon atom for every two atoms of oxygen. If there are impurities or other elements in the quartz, instead of being clear, it may be blue, brown, red, or some other color. The blue or purple variety is called amethyst. The brown type is smokey quartz, and the red is rose quartz.

Some crystals are rare and valuable. When cut and polished, they become beautiful 'gems'. Gems include diamonds, rubies, sapphires, and emeralds. We use gems to make jewelry that many people love to wear.



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Igneous Rocks

Minerals and gems come from rocks. Rocks are categorized into three types: igneous, sedimentary, and metamorphic. Many minerals and gems are found in igneous rocks.

The word ‘igneous’ comes from the Latin word *ignis*, which means fire. Igneous rocks solidified from molten or partly molten rock. When the molten rock is below the earth it’s called magma, but when it erupts on the earth, like from a volcano, it’s called lava. However, it’s possible some rocks that are deep inside the earth and that are called ‘igneous’ were never molten, but were created when God first made the earth.

DEFINITION

Igneous rocks

Rocks that were once molten (liquid) or are believed to have been molten at one time.

Most of the earth is made up of different types of igneous rocks. Volcanic rock is common. At some time it came from erupting volcanoes in the form of hot liquid lava that traveled up from deep inside the earth. After the lava erupted, it cooled and became solid, with mineral crystals so small that you need a microscope to see most of them. We’ll talk more about this type of rock in chapter 2.

Another type of rock is sedimentary rock. Sedimentary rock is made up of pieces of minerals and other rocks, called grains, that were originally laid down by water, wind, or ice. The grains were then cemented together into hard rock when another mineral such as silica (quartz) deposited out of the water between the grains.

DEFINITION

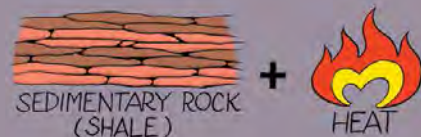
Sedimentary rocks

Rocks laid down from water or wind that have been chemically cemented.

The last sort of rock, metamorphic, started out as either igneous or sedimentary rock but was altered or changed, usually by heat and pressure. For example, when sandstone is heated under pressure, the grains join together to form quartzite. The same happens to limestone which changes to marble. Just like metamorphosis changes caterpillars into butterflies so the metamorphosis of rock changes its features.

OBSERVATION

80% of sedimentary rock is shale, composed of very fine grains of sediment like mud or clay. Under the ground, when shale is heated it changes to slate, which is commonly used as tiles on floors. Slate is a metamorphic shale.



DEFINITION

**Metamorphic
rocks**

Rocks that started off as igneous or sedimentary but have been transformed to another type of rock by heat, pressure, and other causes.

The Structure of the Earth

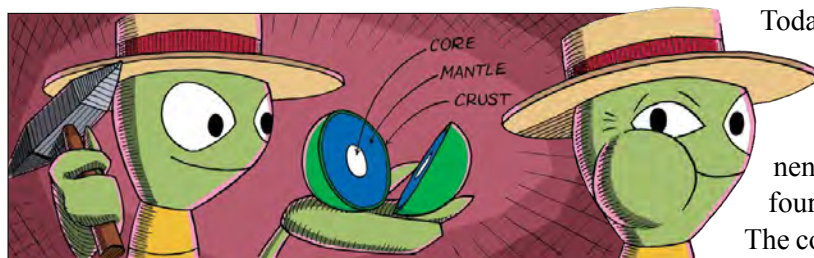
Imagine the earth is like a ball that is made up of three main layers: a core at the center of the earth, a mantle in the middle, and a thin crust on top. For Mr Hibb, it reminds him of a candy jawbreaker.

Scientists can't travel under the ground so they can only study the surface of the crust. They learn about the layers deep below the surface by studying earthquake waves recorded using modern scientific instruments. Sometimes volcanoes bring up rocks from deep in the earth, and these deep rocks provide more information about the lower crust and mantle.

The radius of the core is about 2,000 miles thick (3,200 kilometres). The middle part of the core is solid while the outer part is liquid. It is believed to be made mostly of iron. Iron is a metal we use to make hammers and many other things.

The mantle is about 1,900 miles (3,050 kilometres) thick. Scientists do not know for sure what kind of rocks make up the mantle. But, they have some ideas based on rocks brought to the earth's surface by volcanic eruptions, which they believe are from the mantle.

The top part of the earth is called the crust. Compared to the rest of the earth it is very thin, like the frosting on a cake. We walk on the top of the crust.



Today, there are two types of crust, the crust under the ocean, called oceanic crust, and the crust on the land, called continental crust. Oceanic crust is about four miles (6 to 7 kilometres) thick. The continental crust is much thicker, about 30 miles (50 kilometers) thick.

The continental crust is made of different types of granite rocks and these are often visible on the surface. Much of the granite is covered with a thick layer of sedimentary rock.

Granite

Granite is one of the most common rocks seen on the surface of the earth. One of the 30 rocks you collected may be granite. Granite looks like it has salt and pepper specks in it with possibly other colors. It is made of a number of minerals that are locked together. You can see the minerals without a microscope. One mineral that is always found in granite is quartz. In granite quartz can look milky, like 'salt', or it can look grey.

Geology rocks!

Would you like your children to be introduced to the world of geology—from a biblical perspective?

This one-of-a-kind geology book is packed with evidence to help children learn about the earth beneath their feet. It lets them see how the rocks can be explained by the history of the Bible, and appreciate the effects of creation and Noah's Flood on what they see in the world.

Mr Hibb, a curious and amazing grasshopper, will take them on a journey. See how he captivates their imagination with his questions and antics on all sorts of interesting geology topics. Through its strikingly illustrated pages they will also discover exciting information about rocks, minerals, fossils, stalagmites, crystals and much, much more.

Exploring geology also has lots of hands-on activities that will stay in their memory. These simple experiments can be done at home with readily available ingredients, and provide great opportunities to learn by doing.

