Rocks and Minerals

Background knowledge / teacher notes:

The whole earth is made of rocks & minerals. Inside the earth there is a liquid core of molten rock and on the outside there is a hard crust. If you compare the earth to an egg, the shell on an egg is like the crust on the earth. The crust is made up of rocks and minerals. Much of the crust is covered by water, sand, soil and ice. If you dig deep enough, you will always hit rocks.

Below the loose layer of soil, sand & crumbled rocks found on Earth is bedrock, which is a solid rock.

A mineral is composed of the same substance throughout. If you were to cut a mineral sample, it would look the same throughout. A mineral’s chemical makeup is definite and never changes. Mineralogists, scientists who study and identify minerals, have found about 3,000 minerals in Earth’s crust. Minerals have definite chemical and physical properties, which identify them.

Crystals are minerals that have had the chance to grow in the shape that they were meant to be. Just like your DNA determines the color of your eyes, how tall you will get to be and the shape of your bones, the chemicals that a mineral is made of determines what shape it gets to be. We can tell different minerals apart by what crystal shape they are. Sometimes minerals form in spaces where there is not a lot of room, so they don't have a crystal shape. When there is just a big hunk of a mineral, it is called a massive mineral. If there is a definite shape with easy to see flat sides, it is called a mineral crystal. Most of the earth's crystals were formed millions of years ago. Crystals form when the liquid rock from inside the earth cool and harden. Sometimes crystals form when liquids underground find their way into cracks and slowly deposit minerals. Most mineral crystals take thousands of years to "grow" but some like salt (halite) can form so quickly that you can watch them grow at home! Some people think of crystals as clear pretty rocks that are used for jewelry. Amethyst is a very common quartz crystal. Crystals do not have to be clear, but those are the kinds you will usually see in the stores.

**Misconceptions**: Students do not know the difference between a mineral and a rock. It is important that you do not tell them. Simply explain that they will be able to explain the difference to you by the end of these lessons.

Students often want to know if geodes are rocks or minerals. Geodes are actually minerals that grow inside of rocks. There are many theories to explain how geodes actually form. This unit on minerals and rocks is a good time to allow students to share samples they have. As they become more knowledgeable about the difference between rocks and minerals, they can start to identify the minerals within rocks and perhaps create their own theory of what geodes are and how they form.

Classifying Minerals

Classify the following minerals based on their physical properties.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Mineral** | **Color(s) \*3 words** | **Luster** | **Streak** | **Hardness** | | | | |
| **Is Scratched By** | | | | |
| **Finger-nail** | **Penny** | **Nail** | **Glass** | **Moh’s Scale Number** |
| 1 |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |
| 9 |  |  |  |  |  |  |  |  |

Marvelous Mystery Minerals

|  |  |
| --- | --- |
| **Mineral** | **Name of Mineral** |
|
|
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 8 |  |
| 9 |  |

Answer Key

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Properties of Minerals** | | | | |
| **Mineral** | **Color** | **Luster** | **Streak** | **Hardness** |
| **Gypsum** | **Gray, white, brown, pink** | **Milky, frosted, little shine**  **Yes/no** | **white** | **1 or 2** |
| **Quartz** | **White, clear** | **Glassy, frosted, sparkly**  **Yes** | **white** | **7** |
| **Pyrite** | **White, gray, speckled gold, brassy yellow** | **Metallic**  **Yes** | **Gray, Greenish-black** | **6** |
| **Calcite** | **White, creamy, shiny, beige** | **Shiny, milky**  **Yes** | **white** | **3** |
| **Galena** | **Black, gray, silver, steel gray** | **Metallic, sparkly**  **Yes** | **Dark gray, blackish** | **3** |
| **Feldspar** | **Peach, salmon, pink, brown** | **Earthy, shiny, dull**  **Yes** | **None** | **6** |
| **Mica** | **Silvery, copper, black** | **Shiny, translucent**  **Yes** | **Pale white** | **2 or 3** |
| **Hematite** | **Red, brown, bits of gold** | **Earthy, dull**  **Yes** | **Red-brown, brown, red** | **5** |
| **Talc** | **White, pale, green, hint of brown** | **Dull**  **No** | **White** | **1** |