

## Identifying Minerals

All rocks are made up of minerals. Rocks have different colors, textures, and shapes. Some rocks or minerals are very hard. Some are soft.

A gemstone is a mineral that is rare and beautiful. Color, luster, radiance, and hardness are properties that make a mineral valuable as a gemstone. Diamonds, rubies, opals, emeralds, and sapphires are all gemstones.

Minerals are identified by their physical properties. A physical property is something you can see, feel, taste, touch, or smell. You can learn to identify many common minerals by paying attention to or testing these properties. The first is **color**. Some minerals are usually one color, but some can be different colors. You cannot identify a mineral by color alone, but it is a useful property to use for identification. The second is **form**. Does it have a crystal shape or grainy fibers?

**Luster** is the way light is reflected from the mineral. It can be metallic, which is shiny like a metal; or it can be nonmetallic and appear dull, glassy, or pearly.

**Streak** is another way to identify a mineral. When the mineral is scraped across a porcelain tile, what color does it leave behind? Each mineral makes a streak of a certain color. This color may be different than the color of the mineral itself. For example, the mineral pyrite looks like gold. It is a golden color, but it leaves a greenish-black streak. This is the way to tell if you have found a valuable gold nugget, or just a piece of “fool’s gold.”

You can also look at the way a mineral breaks. **Cleavage** is breakage along smooth, flat planes. If it fractures, it breaks leaving rough, jagged, or curved lines.

Some minerals have special characteristics by which they can be identified. The way they taste or the way they react with another substance may be a way to identify the mineral. The mineral halite, for example, tastes salty. Calcite will react with a mild acid to produce bubbling.

The final way to identify a mineral is by its **hardness**. The Mohs’ Scale of Hardness was developed to help identify common minerals. A German scientist named Friedrich Mohs developed this system for comparing the hardness of a mineral to ten common minerals. Mohs’ scale is based on common minerals, not on exact differences in hardness. The difference in hardness between minerals three and four is much less than the difference in hardness between minerals nine and ten. Even though the scale is not exact, it is useful for identifying mineral specimens.

## Identifying Minerals (cont'd)

Talc is a mineral that is so soft you can pinch it into powder with your fingers. Diamonds are the hardest minerals found on earth. They can cut glass. A harder mineral can scratch a softer one. Each mineral on the scale can scratch a mineral with a lower number. Your fingernail has a hardness of about 2.5. A fingernail can scratch talc and gypsum, but not calcite.

### Mohs' Hardness Scale:

- |                   |  |
|-------------------|--|
| 1. Talc           | softest; can be scratched by a fingernail                        |
| 2. Gypsum<br>talc | can be scratched by a fingernail but cannot be scratched by talc |
| 3. Calcite        | can be scratched by a penny                                      |
| 4. Fluorite       | can be scratched by a steel knife or a nail file                 |
| 5. Apatite        | can be scratched by a steel knife or a nail file, but not easily |
| 6. Feldspar       | knife cannot scratch it; it can scratch glass                    |
| 7. Quartz         | scratches glass and steel  |
| 8. Topaz          | can scratch quartz   |
| 9. Corundum       | can scratch topaz  |
| 10. Diamond       | can scratch corundum and all others                              |

It can be fun to collect rocks and minerals. People collect all kinds of things. Minerals are probably the oldest things in the world you could collect. When you collect them, you will realize how different they are from each other. You can identify them by using your eyes and remembering some of their physical properties.

## Identifying Minerals Questions

1. What is a mineral?
  - a. an element
  - b. a rock formed from something that was once living
  - c. a naturally formed solid substance with a crystal structure
  
2. All rocks are made of:
  - a. minerals
  - b. something that was once living
  - c. sand
  
3. What is a gemstone?
  - a. a mineral that is rare and is considered to be beautiful
  - b. a rock or mineral that is used to make jewelry
  - c. a rock or mineral that is valuable
  - d. all of the above
  
4. Diamonds, rubies, opals, emeralds, and sapphires are all examples of:
  - a. minerals
  - b. gemstones
  - c. both a and b are correct
  - d. none of the above
  
5. How can minerals be identified?
  - a. by their physical properties
  - b. by their color, luster, and hardness
  - c. by their form, streak, and cleavage
  - d. all of the above
  
6. The way light is reflected from a mineral is called:
  - a. color
  - b. texture
  - c. luster
  
7. Cleavage is the way a mineral:
  - a. breaks
  - b. shines
  - c. sparkles
  
8. Friedrich Mohs designed a scale to test a mineral's:
  - a. luster
  - b. streak
  - c. hardness

### Identifying Minerals Questions (cont'd)

9. If you find a mineral, and you can scratch it with a penny, but not a fingernail, it must have a hardness of:
- 1
  - 2
  - 3
10. If you find a mineral and you can scratch it with your fingernail, it must have a hardness of:
- less than 3
  - between 3 and 5
  - greater than 5

True or False?

1. You can identify a mineral by its color and nothing else.
2. You can use Mohs' hardness scale and definitely tell which mineral you have.
3. Minerals can be identified by many different properties.
4. The Mohs' scale is not very useful for identifying minerals.
5. All rocks are made of minerals.
6. There is a way to tell if you have found a real gold nugget or a piece of fool's gold.
7. You can tell if you found a diamond because it could cut glass.
8. If you have a white mineral that you can pinch it into a powder, you know it's talc.
9. The streak a mineral leaves is always the same color as the mineral itself.
10. A quartz crystal can be identified by its hexagonal shape. This property is known as form.