

## Reflect

Think about the ingredients you use to bake a cake. Most cake recipes include flour and sugar to make the cake fluffy and sweet!

You need to measure out 2 cups of flour to get started. You notice there are two jars on the counter that have a fluffy, white powder. One is flour, and one is powdered sugar. How can you know which one is which?



**We can describe and identify matter based on its properties.**

All types of matter have physical properties. In the example above, the flour and the powdered sugar have some physical properties in common. They are both white powders. Their particles are about the same size. However, they do have some properties that are different! Have you ever tasted powdered sugar? How about flour? Flour is very bland and doesn't have much taste. Powdered sugar is very sweet! What can you do to figure out which one is the flour? You can taste them!

**Matter can have many different properties!**

How does matter behave when placed in water? What if it is stirred into water? How does matter react to a magnet? Some properties of matter describe how substances behave in the presence of other substances. For example, what happens when objects are exposed to water or magnets? What happens when objects are exposed to energy?

# Properties of Matter

## How can we measure, test, and record different properties of matter?

**Hardness:** How soft or hard an object is can be used to describe it. Scientists use hardness in order to identify the types of minerals in rocks. Yes, some rocks are harder than others! Talc is a type of mineral that is used to make soft powders. Quartz is a type of mineral used to make hard glass, such as the cover of a watch. Quartz is much harder than talc.

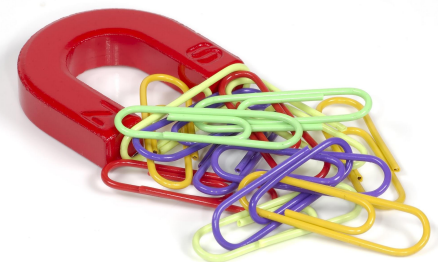


**Reflectivity:** Why can you see yourself when you look into a mirror? The mirror is reflective! It bounces light back to your eyes so you can see yourself. Look at the two sets of plumbing pipes. The top set is made of steel, and the bottom set is made of PVC material. Steel is a reflective metal, and PVC is not. How can this property help you identify the two sets of pipes?

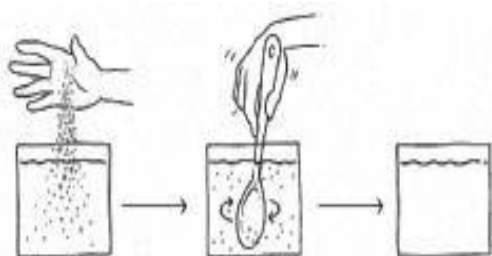
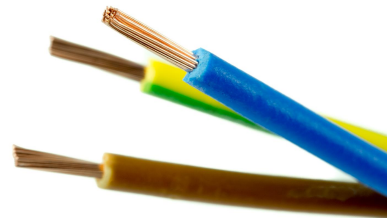


**Magnetism:** Magnetism is a physical property of some metals, such as iron. A magnet may attract (or pull) objects made of iron toward it and can pick up some of them. Not all metals are magnetic.

Aluminum, copper, tin, and gold are not attracted to magnets. Nonmetals — such as plastic, wood, and paper — are also not attracted to magnets.



**The Ability to Conduct Thermal Energy or Electric Energy:** Materials that allow energy to pass through them easily are called *conductors*. Many metals — including copper, iron, and aluminum — are good conductors of both thermal and electrical energy. Pots and pans are usually made of metal, because they conduct thermal energy well. Wires used in circuits are generally made of copper, because it is a good conductor of electrical energy. Insulators are materials that slow or stop the flow of energy. Wood, plastic, and fabric are good insulators of both thermal and electrical energy.



**Solubility in Water:** Solubility is the ability of a solid to dissolve in a liquid. To *dissolve* means to interact with and spread out evenly in the liquid. Because sugar and salt both dissolve in water, they are classified as water-soluble. Many solids, such as sand and iron filings, are not water-soluble.

## Try Now

Choose one of the properties above and test it at home! Find a few different powders in the kitchen and investigate their ability to dissolve in water. Or, choose a few objects at home and investigate if a magnet will stick to them or not. Be sure to stay away from any electronic items! Describe what you did as well as your observations in the space below.