

# Matter - Introduction

By Sharon Fabian

<sup>1</sup> A long time ago, some people got the idea to use science to change worthless metals into gold! Their new "science" was called alchemy. Then some other people, those who were thinking more logically, proved that it just wasn't possible. Science may be amazing, but it can't really cause miracles. You can't change a cheap metal into gold; science and nature have their own rules which are not to be broken!



<sup>2</sup> Gold, iron, tin, other metals, and other objects and materials are all what scientists call matter. One definition of matter is anything that takes up space. So elephants and hippos are made of matter. So are ants and fleas. Rocks, trees, clouds, ocean water, ocean liners, diamond rings, iron nails, plastic Easter eggs, milkshakes, and the helium in a Happy Birthday balloon -- all are made of matter.

<sup>3</sup> Just like other fields of science, the study of matter has rules. The branch of science that studies all of the rules involving matter is called chemistry.

<sup>4</sup> Chemists often start their study of matter by looking at some of its properties. Properties are details that describe a particular type of matter. You might also call them qualities or characteristics. One property of a diamond is its hardness. One property of a helium balloon is that it is lighter than air. A property of elephants, hippos, ants, and fleas is that their bodies contain the chemical carbon.

<sup>5</sup> Color, hardness, odor, and shape are a few of the properties of matter. Mass is another one. Mass is similar to weight; it tells how much matter is in something. Another property is called density. Density tells how tightly the matter is packed together. For example, if you took a loaf of bread and squashed it up really small, it would still have the same mass as before, but it would have a lot more density. There are many more properties. Buoyancy tells how well an object will float. Solubility tells if something will dissolve in water or another liquid. Elasticity tells how well it will stretch. Viscosity tells if it will flow fast like water, or slow like syrup. Brittleness tells if something will snap into two pieces. The freezing point and boiling point of a material are two more of its properties.

<sup>6</sup> Knowing a little bit about matter and its properties would have saved the alchemists a lot of trouble. It could also save you from another mistake if you ever go mining for gold. Have you ever heard of fool's gold? It is shiny, hard, and gold-colored like real gold. In fact it has many of the same properties as gold. But it is not gold, and you can tell the difference by using the property of solubility. Real gold does not dissolve in acid, but fool's gold does. So if you find a bright shiny nugget, but you're not sure if it's real gold or fool's gold, take it to a chemist and have them put your nugget into some acid. If it's real gold, it will still be there. If it's fool's gold, it will just melt away!

<sup>7</sup> The science of chemistry can tell us all kinds of useful things. How could you use the properties of matter to tell the difference between a diamond and a diamond-shaped piece of glass? Can you think of a way to determine if a shaker in your kitchen contains grains of sugar or grains of salt? Just think like a scientist, and remember the properties of matter.

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Name \_\_\_\_\_

Science Pd \_\_\_\_\_

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<p>1. Anything that takes up space is called</p> <p><input type="radio"/> A Nature</p> <p><input type="radio"/> B Chemicals</p> <p><input type="radio"/> C Metal</p> <p><input type="radio"/> D Matter</p>	<p>2. The branch of science that studies matter and its properties is</p> <p><input type="radio"/> A Chemistry</p> <p><input type="radio"/> B Biology</p> <p><input type="radio"/> C Earth science</p> <p><input type="radio"/> D Geology</p>
<p>3. Color, hardness, viscosity, and brittleness are</p> <p><input type="radio"/> A Properties of energy</p> <p><input type="radio"/> B Types of matter</p> <p><input type="radio"/> C Types of energy</p> <p><input type="radio"/> D Properties of matter</p>	<p>4. Inexpensive metals can be changed into gold.</p> <p><input type="radio"/> A True</p> <p><input type="radio"/> B False</p>
<p>5. Fool's gold is one kind of real gold.</p> <p><input type="radio"/> A True</p> <p><input type="radio"/> B False</p>	<p>6. Solubility describes how well an object will float.</p> <p><input type="radio"/> A True</p> <p><input type="radio"/> B False</p>
<p>7. Viscosity tells how fast a liquid will flow.</p> <p><input type="radio"/> A True</p> <p><input type="radio"/> B False</p>	<p>8. A raindrop is made of matter.</p> <p><input type="radio"/> A True</p> <p><input type="radio"/> B False</p>

