

Directions: Read the passage below and then use the information in the passage, your vocabulary, the periodic table, and your science notebook to answer the questions.

Matter

All matter is made up of particles and those particles are in motion. This is what scientists refer to as the Atomic Theory. This is only a theory, as we can gain information and evidence to support the idea, but cannot fully test the idea. Scientists can't test it because the particles that make up matter are very small and can't be seen, even with a microscope. They are much smaller than the smallest cell. If you think about it, cells are made up of matter. One human skin cell is made up of thousands and thousands of atoms.

Atoms are the smallest particle of matter to maintain all physical and chemical properties. For example, an atom of iron (Fe) is the smallest piece of iron that is still a magnetic metal that rusts. A pure piece of iron is made up of only iron atoms. Iron is an element that exists naturally on earth. Iron is the 26th element on the periodic table. Iron is a nonrenewable resource. It is one of Earth's precious metals.

Matter exists naturally on earth in three main states. Matter can be a solid, a liquid, or a gas. Matter can also exist as plasma. Plasma only exists under extreme temperatures and pressure. Matter can change state. For example, iron is a solid, but if we heat it up and melt it, iron becomes a liquid. Iron can even become vapor. If you heat iron to an extremely high temperature (2,000 degrees Celcius), it turns into vapor in the air. This iron vapor would quickly react with the oxygen in the air to form FeO. Iron oxide is a molecule. Molecules are made up two or more elements. These elements must be bound together chemically to form compounds. When atoms of elements bond together chemically, they form new substances with new properties. These new substances are called compounds.

Let's look at the characteristics of iron as it exists in all three natural states of matter. As a solid, iron has a definite shape; the particles are packed tightly together and very organized. As we heat the iron up and it begins to melt, the iron loses its shape and takes the shape of the container in which it is stored. Liquid iron is often poured into molds or casts to make things like golf clubs, car parts, and wheels. The molten iron will take the shape of the cast and cool to form the same shape. Iron as a gas escapes very quickly, because gases move rapidly, and spread out very quickly. Gas particles do not have a definite volume because they can be compressed and they will expand to the limits of their container.

Questions:

1. Which of the following is not an atom?
 - a. Nitrogen (N)
 - b. Copper (Cu)
 - c. Carbon Dioxide (CO₂)
 - d. Aluminum (Al)
2. Which statement about elements is not true?
 - a. Elements are found on the periodic table
 - b. Elements are made up of molecules.
 - c. Elements are made up of atoms.
 - d. Elements exist naturally on earth.
3. Solids are very organized and are packed tightly together because....
 - a. They are compressible
 - b. They are pourable
 - c. They have a definite shape
 - d. They move freely.
4. Matter can change from a solid to a liquid if you
 - a. Cool down the particles
 - b. Heat up the particles
5. Place the substances below in order from the smallest to the largest.

Water molecule _____

Oxygen Atom _____

Ice cube _____

Hydrogen atom _____

6. Theories are not laws in science because.....
 - a. Not everyone agrees.
 - b. They can't be tested over and over under the same conditions.
 - c. Nobody wants to study them
 - d. They are controversial.

7. Which is smaller, an atom or a cell? _____ Write a sentence to justify your answer. Justify means to show support, or explain!

8. Gases do not have a definite volume because
 - a. They are compressible
 - b. They are pourable
 - c. They have a definite shape
 - d. They move freely.
9. Which statement is not true of a liquid?
 - a. They are pourable
 - b. They have a definite volume
 - c. They repel one another
 - d. They take the shape of their container.

Write your sentence here.