**Explain**

**Activity 8- Matter, Molecules and Atoms**

**Purpose**

Students summarize and connect the concepts developed in past activities and compare their understandings with scientifically accepted beliefs.

**Activity Description**

Students follow a text in the middle strategy to organize and confirm their understandings of matter, atoms and molecules.

**Focus Question**

How is matter in it smallest form described?

**Duration**

One class session

**Materials**

Student copies of the text in the middle reading

**Teacher Preparation**

Make copies of reading activity for each student

**Classroom Procedure**

1. Pass out copies of text in the middle reading.
2. Students read one section of the text and in the left hand column write the meaning in their own words.(GIST)
3. In the right hand column, write or draw what this looks like.
4. At the end of each section, class discussion occurs to develop agreement on the meaning of the passage.
5. At the end of the article, each student writes a summary of the article in their notebook.

**Text in the Middle**

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| GIST  In my OWN words this means . . . | TEXT  *Chemistry is the study of matter*  You could say that chemistry is the science that studies all the stuff in the entire world. A morescientific term for “stuff” is “matter.” So chemistry is the study of matter. Matter is all the physical things in the universe. All the stars in the galaxies, the sun and planets in our solar system, the Earth, and everything on it and in it are matter. All human-made objects, all organisms, the gases in the atmosphere, and anything else that has mass and takes up space, including you, are examples of matter. Chemistry is special because it looks at matter all the way down to its smallest parts: the atoms and molecules that matter is made of. | Write or draw what you visualize while reading the text. |
| GIST  In my OWN words this means . . . | TEXT  To give you an idea about how small atoms and molecules are, use a metric ruler to look at the length of one millimeter. It is about the size of a dash like thisone -. Try drawing a tiny line or dot that is about 1/10 as long as the dash. It might be about the size of a period like the one at the end of this sentence. A hydrogen atom is about 1 ten millionth of the size of the period. So it would take about 10 million hydrogen atoms lined up next to each  other to go from one side of the period to the other. | Write or draw what you visualize while reading the text. | |
| GIST  In my OWN words this means . . . | TEXT  Here is another way to imagine how small atoms and molecules are. In about 1 tablespoon of water, there are about 600 billion trillion water molecules. That’s 600,000,000,000,000,000,000 ,000. This number is so huge that even if you could count one million molecules every second, it would take you about 200 million centuries or about 20 billion years to count all the molecules in a tablespoon of water. | Write or draw what you visualize while reading the text. |
| GIST  In my OWN words this means . . . | TEXT  Studying chemistry can help make sense of many of the different things you see and do every day.What you eat and drink, the weather outside, the soap and water you wash with, and the clothesyou wear, are all a result of chemistry. The sports equipment you use, the materials your house ismade of, the way you get to school, and the electronic equipment you use are all a result of theinteractions of atoms and molecules.Having a better idea of what atoms and molecules are and how they interact can help you betterunderstand the world around you. | Write or draw what you visualize while reading the text. |
| GIST  In my OWN words this means . . . | TEXT  Matter is made of atoms and molecules  We have already used the term *atom* and *molecule* a couple of times.You will learn a lot more about atoms and molecules later on.  For now, let’s say that atoms and molecules are the extremely tinyparticles that make up all the matter on Earth. An atom is the basicbuilding block of all matter. A molecule is made of two or more atomsconnected or bonded together.Even though atoms and molecules are not the same, the model we areusing shows both atoms and molecules as little circles orspheres. This model makes it easier to show some of the basic characteristics  of the different states of matter on Earth. | Write or draw what you visualize while reading the text. |
| GIST  In my OWN words this means . . . | TEXT  Most elements are composed of individual, identical atoms. For this reason, they are not ordinarily broken down and are homogeneous. Elements differ from one another in their "proton counts." The numbers of these sub-atomic particles defines the properties of its atoms. Neutrons add mass and are central to nuclear properties, but they barely affect the surrounding electron cloud. | Write or draw what you visualize while reading the text. |
| GIST  In my OWN words this means . . . | TEXT  MOLECULE: two or more atoms bonded together in a new, whole particle of matter. Molecules have various shapes, depending on the way in which their atoms are bonded. They are small, with a wider range of sizes than atoms. Molecules contain from two atoms to hundreds of atoms. Some molecules are smaller than atoms, while others are much larger. Nevertheless, the atomic or molecular world is still small compared to our macroscopic world of matter. | Write or draw what you visualize while reading the text. |
| GIST  In my OWN words this means . . . | TEXT  Many ELEMENTS are composed of simple molecules. Hydrogen, nitrogen, oxygen, fluoride, chlorine, bromine, iodine, and astatine are made of two-atom (diatomic) molecules. Most COMPOUNDS are made of molecules. Like elements, they possess uniform properties because of the repeating molecular units. Unlike elements, compounds can be broken down by chemical means. | Write or draw what you visualize while reading the text. |