**Lesson Plan**

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| Objectives: | * To establish a visual understanding of basic molecular structure and polarity. * Determine the need and parts of essential elements. * Create a knowledge of building block elements. |

*Lecture Based on Given Pamphlet*

Fluoride:

Have you ever wondered what's in the blue goo you brush your teeth with? With the chemical configuration of F2, Fluoride is what prevents your teeth from getting cavities in a natural way. Fluoride is naturally present in water and air and is in our drinking water to keep our teeth strong and healthy. Fluoride is the 13th most common element found on Earth and is derived from phosphoric rock when added to water systems.

Water

Water makes up our oceans, rivers, and lakes! It's all around us! Water is made of one oxygen molecule and two hydrogen molecules. Opposites attract, and the two positive Hydrogens molecules are attracted to the negative oxygen molecule. Water is a universal solvent as well, which means it can dissolve other substances. For example, have you ever put sugar in water? When you do the water causes the sugar to dissolve, mixing sugar molecules with water molecules.

Salt

At dinner time, to add a bit of flavor, typically we use salt to mix things up! Salt, or NaCl, is something the human body can't live without. It helps transmit nerve pulses and relax muscles, but too much salt can be very unhealthy. Salt also makes up a majority of the ocean, with 96.5% of the water on Earth.

Carbon Dioxide

Carbon dioxide is a gas comprised of carbon and two oxygen atoms. When you exhale carbon dioxide gas is created and is food for the plants around us. Have you ever wondered why there are bubbles in some drinks? These drinks are carbonated, meaning adding carbon dioxide to drinks creates bubbles that give that fizzy feeling!

Atoms

An atom is the smallest building block of life on Earth. All elements are composed of atoms, such as water, salt, carbon dioxide, and fluoride. There are oxygen atoms, carbon atoms, fluoride atoms, and many more that make up the basic elements of life.

*Molecular Configuration Worksheet*

1. What is the basic building block of life?
2. What is Salt’s chemical formula?
3. What is Carbon Dioxide’s chemical formula?
4. What is Fluoride’s chemical formula?
5. What is Water’s chemical formula?
6. What molecule serves as food for plants?
7. What is the element in toothpaste that makes your teeth healthy?
8. What is found in 96.5% of ocean water and is used for seasoning?
9. What is the element we drink when thirsty and great for dissolving?

*Understanding Molecules Lab/Group Activity*

1. Split class into groups, each containing a puzzle box.
2. Have students take the puzzle pieces and put them in the right place, observing the polarity.
3. Have students rotate the puzzle box around in their groups.
4. Have groups rotate with different experiments.
5. Associated with the different puzzle boxes the following experiments should be made:

**Water Puzzle Box:**

Materials:

* Cup of water
* Sugar

1. Have students feel/observe the water in a cup
2. Take sugar and have students stir the sugar until it dissolves
3. Describe/Observe how the sugar has disappeared.
4. Highlight that water is a universal solvent.

**Fluoride Puzzle Box:**

Materials:

* Eggs, regular and hard-boiled
* Toothbrush and Toothpaste
* A glass of juice or soda

1. Describe to students that eggs have a hard exterior shell similar to teeth
2. Take hard-boiled eggs, and have them soak in juice/soda (overnight) so they become stained.
3. Have students make predictions of what will happen to the eggs.
4. After, remove the eggs and brush the toothpaste against the egg, and have students observe the stain loss or feel the texture of the egg before and after.
5. This shows how stains are removed with toothpaste...Fluoride.

**Salt Puzzle Box:**

Materials

* Small plastic jewels
* Two cups full of water
* Salt

1. Place salt in one cup, mixing it in, and have the other cup remain with clean water.
2. In both cups place the plastic jewels in them
3. Have students observe/feel what happens to the jewels
4. Explain that the salt makes the water much denser allowing for objects to float, just as many things in the ocean.

**Carbon Dioxide:**

Materials:

* Coke and Mentos

1. Have the students observe/feel the carbonation of the soda.
2. Place 5-8 mentos in the bottle of Coca-cola and shake the bottle.
3. Feel and see the explosions/chemical reaction creates.
4. Explain that the bubbles (carbon dioxide) are constantly expanding on the surface of the mentos. As the mentos quickly sink to the bottom of the soda, increasing pressure has the liquid leave the bottle.