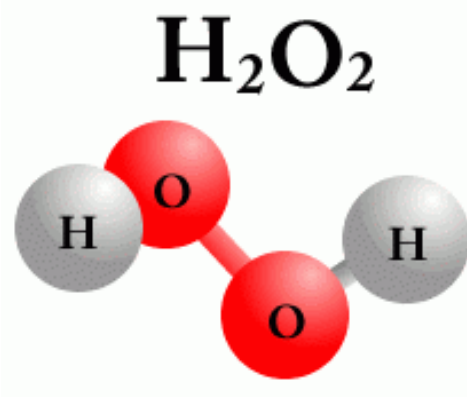
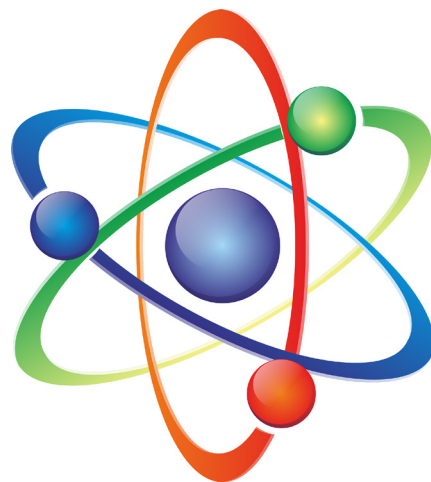


What it's About

Atoms – Atoms are the building blocks of all matter. (Matter is the science word for anything that takes up space and has weight. Basically, *everything!*) They are the smallest particles in the universe that can't be further divided. One grain of salt contains a *billion billion* (10^{18} —a quintillion) atoms! It is hard to even fathom how miniscule atoms are. They are too small to be seen, even with the most powerful microscope. So how do we know atoms exist and that they make up everything? The answer is, by observing how different substances behave and how they react to other substances. This is the study of science, and it helps us understand atoms and how they interact with each other.

The **Periodic Table of Elements** names all the atoms that we know, as well as their properties.

Molecules – Atoms combine with each other to form molecules. A molecule is the smallest particle that has all the intrinsic properties of a substance. For example, water is H_2O , which stands for 2 hydrogen atoms and 1 oxygen atom. Every molecule of water is made up of the same 3 atoms. A cup of water contains many billions of this particular molecule. When there are different types of atoms in the molecule, it is called a **compound**. When there is only one type of atom in the molecule, it is called



an **element**. Oxygen is an example of an element. The oxygen gas that we breathe is made up of molecules that contain only oxygen atoms. The molecule is O_2 , which means 2 oxygen atoms bonded together to form one molecule.

Hydrogen Peroxide is a liquid which is written as H_2O_2 . This means that each molecule has 2 hydrogen atoms and 2 oxygen atoms. A container of hydrogen peroxide left open cannot remain in its current form, and slowly separates into water and oxygen. On the molecular level, two hydrogen peroxide molecules ($2-H_2O_2$) have four hydrogen atoms and four oxygen atoms. When separated, it produces two water molecules ($2-H_2O$) and one oxygen molecule (O_2).

Decomposition – Decomposition is when a substance breaks down into two (or more) new substances because the molecules separate. When heat is released during decomposition, it is called an **exothermic reaction**.

How the experiment works

With hydrogen peroxide, decomposition happens naturally even without adding any yeast. However, it would happen very slowly. Yeast contains an enzyme called catalase, which is a catalyst. This means that it causes the decomposition to happen at a quicker pace. The oxygen gas that is formed gets trapped in the soap and makes bubbles, creating all the foam that comes piling out of the bottle. Some heat is created, making it an exothermic reaction (see above).



Science Words

- | | |
|--------------------------------|------------------------------------|
| ___ atom | A. atoms bonded together |
| ___ matter | B. H_2O_2 |
| ___ periodic table of elements | C. an atom found in air |
| ___ molecules | D. acts as a catalyst |
| ___ hydrogen | E. smallest particle |
| ___ oxygen | F. molecules with same atoms |
| ___ compound | G. molecule separating |
| ___ element | H. speeds up the chemical reaction |
| ___ hydrogen peroxide | I. list of all the atoms |
| ___ decomposition | J. molecules with different atoms |
| ___ exothermic reaction | K. releases heat |
| ___ enzyme | L. something with weight and size |
| ___ catalyst | M. an atom found in water |

Lesson Review Questions



1. How are atoms and molecules similar? How are they different?

2. Is hydrogen peroxide a compound or an element? Why?

3. Why is the yeast called a catalyst?

4. Why is the soap necessary for this experiment?

In Your Own Words



What is the topic of this experiment? _____

Procedure - How did the teacher perform the experiment?

Outcome - Describe what happened during the experiment, and why. Use the words you learned in the lesson.
