CHEMISTRY DAILY PLAN

Subject: Matter

'Matter' is the name that scientists give to anything that has mass and occupies space (volume). You and I are made of matter; so is this book and so is the air you are breathing.
Chairs we sit, food we eat, all stars, from simple tools to complicated computers that we use and all the invisible particles of gases forming the atmosphere are some examples of matter. Even all living things; from small organisms to big animals, are all examples of matter. Scientist also use the word 'substances'. This means a particular type of matter, which you can put a name to. Salt is a substance, and so is water. Light is not a substance, because it has no mass and volume and it is not matter.

Example: Which of the following are substances?
a) water b) sugar c) electricity d) alcohol
e) sound f) oxygen g) angel h) Vinegear

The states of matter
There are three states of matter: solid, liquid and gas. **Solids** have a fixed shape—think of an ice cube. **Liquids** have no fixed shape, but they take up the shape of their container and their volume is fixed—think of a liter of water. ***Gases*** have no fixed shape or volume. They spread out (**diffuse**) to fill all the available space—think of steam coming out of a kettle.

Gases are usually invisible, which makes it difficult to think of them as matter at all. But we know gases are a form of matter because they have mass. You can weigh gases—though their density is low, so they don't weigh much. A balloon full of air weighs about 10 g. A bedroom full of air weighs about 75 kg—as much as a person!

Most substances can exist in all three states, depending on the temperature. Water is a solid (ice) below 0°C, a gas (steam) above 100°C and a liquid between these temp eratures.

When we say 'water is a liquid', we mean that the substance scientists know as H2O is a liquid at normal temperatures. 'Normal' temperature is around 25°C in Moldova. But if you live in the Arctic it might be more sensible to say 'water is a solid', because it certainly is one most of the time.

You can decide the normal state of a substance if you know its melting point and boiling point. For example, the element bromine has a melting point of -7°C and a boiling point of 59°C. So at the 'normal' temperature of 20°C, bromine will be melted but not boiled. In other words it will be a liquid.

Solid state: Matter existing in solid state has a definite shape and volume. The atoms and molecules composing a solid are very close to each other. There is very little empty space between particles. Particles of solid states can't move or move very very slowly.

Liquid state: Matter in liquid state doesn't have a definite shape since the molecules of liquids flow over each other. They take the shapes of container in which they are placed. Distances between particles in liquid state are bigger than in solid state. And also the liquid particles move faster than solid particles.

Gaseous state: In gas state, atoms and molecules are quite far apart and move randomly. Gas molecules can form homogeneous mixture. A gas has no definite shape and volume but flows and expands to fill any container in which it is placed and takes its shape and volume. The fastest particles are gas particles.