schoolio

GRADE 5 SCIENCE- MATTER

SCHOOLIO ONTARIO CURRICULUM GRADE 5 SCIENCE – TABLE OF CONTENTS

Lesson # 2 – It's Everywhere!

2 Days

Discussion:

In the last lesson, we talked about how all the songs relate to matter and energy. Now we are really going to dive into what 'matter' means. Have you ever heard that word before?

What do you think it really means? Brainstorm this with you child.

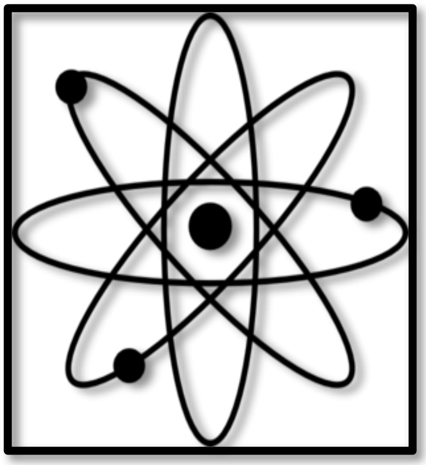
Activity:

Day 1:
Have the students read Reading 2.1 - It's Everywhere.

Complete Activity 2.2 - It's Everywhere.

Day 2 – Watch the Bill Nye video https://www.youtube.com/watch?v=k3SJuozgbfU (preview first)
Complete the reflection in Activity 2.3.

Activity 2.1 - It's Everywhere



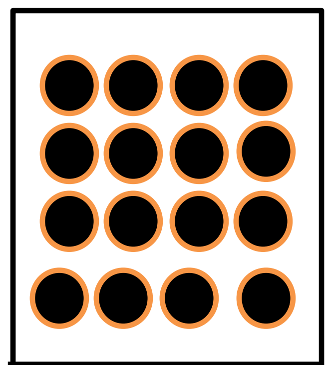
You've probably heard someone use the phrase "it doesn't matter anyway." However, in the world of science, matter, well, it matters!

Matter is made of atoms. These are small particles. In fact, atoms are so small that you can't see them with your eyes, even if you own or use a microscope. The microscope is so large it is actually more of a machine. An atom is a Greek word that means "the thing that you cannot cut." It is indivisible. Everything in the world is made of atoms!

You may have heard about molecules. Well, molecules are even made of atoms. These atoms are like building blocks which make different things. An atom is made from protons, neutrons and electrons. All matter is made of atoms, but some matter has different arrangements for its atoms.

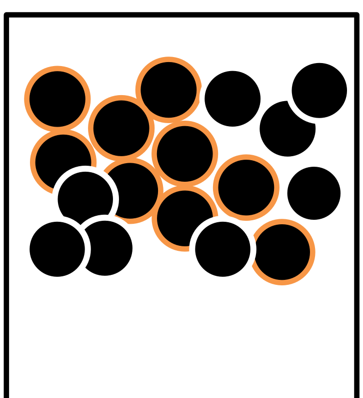
Solids

Atoms that are packed tightly together are known as solids. This means you cannot move through it, even if you wanted to. The particles in a solid are arranged neatly, with the particles locked into place. There is little free space between each particle, so solids can rarely be squished, or compressed. In a solid, like your desk or table, atoms do not move or slide past one another. In a solid like your car or TV, the atoms do not change their shape (it would be kind of weird if the atoms of your TV shifted into a star shape wouldn't it?)



These atoms are arranged neatly and not able to move. They are a solid.

Liquids

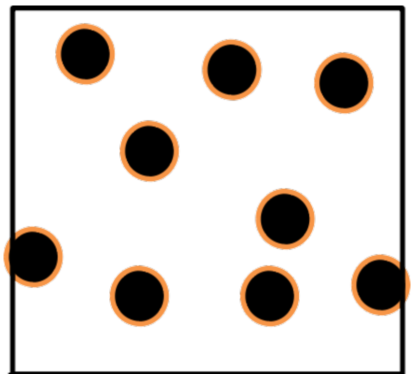


While the atoms are tightly packed together they can move and slide.

You've all had a liquid when you were thirsty. Water, milk, soda and juice are all examples of liquids. These particles are moving slightly all the time. This is why when you put your toe in the pool, you can stick your toe in, and then pull it out. The particles can be moved out of the way, and they move and slide all the time, but the volume is always the same. They can often, but not always, be poured. They are not arranged in a neat pattern like the particles in a solid. However, liquids take on the shape of whatever container they are in. For example, if you poured your lemonade into a paper cup, the lemonade would become the shape of the cup. If you poured it into a vase, it would then become that shape. You cannot pass liquids around easily unless you have a container. If you don't believe it, try handing your parents your cup of milk....without the cup.

Activity 2.1 - It's Everywhere

Gases



The gas particles move quickly and are constantly changing where they are. This means the gas can be compressed or fill a large container.

Have you ever been in a preschool the day after Halloween? Look out! The kids are crazy! Actually, the kids hyped up on candy are rather like the structure of particles in a gas. In a gas, the gas particles move quickly past one another all the time. There is a lot of space between the particles so you can squish (compress) the gas, or it can expand to fill a large container. These particles are vibrating and moving very very quickly. There is no pattern or arrangements to the particles. The air we breathe is made up of different gases.

There are actually two more states of matter. One is plasma and one is Bose-Einstein condensates. But we rarely see these states in everyday life.

Changing Phases

The three types of matter are called the phases of matter. The phases are what form the atom is taking at that time. However, each type of atom can change phases too. For example, liquids can become gases and solids can become liquids. To change phases from solid to liquid or from liquid to gas, you need to apply energy. Many times, that energy comes from heating the item. So, if I want to melt solid water (ice), I just heat it up. If you want to change phases from gases to liquids, or from liquids to solids, then you have to take energy away. If you want to try this at home, you can melt a popsicle in a fry pan with adult supervision. When you apply the pure energy (heat), the solid popsicle melts into a liquid popsicle. If you want to turn it into a gas you must keep heating it until you see steam. But really, who wants to waste a good popsicle?

Activity 2.2 – It's Everywhere

What are the different kinds of Matter? Give an example from your life.	What are some characteristics of each?

Do you think the subtitle 'Can't Escape the Atoms' was appropriate? Why or why not?

Explain how the particles in a solid are different than the particles in a gas. Use specific examples and your own ideas.

Activity 2.3 – Bill Nye Video Reflection

What did you find most interesting?

What did you not know before the video?

What do you want to find out now?