MoLab Mondays!

SLIME TIME!

MoLab is excited to have the opportunity to stay in touch with our MoFamilies and continue to provide on-the-go, dynamic, hands-on, and inquiry-based science experiences through a mobile laboratory that promotes discovery. Our weekly activities will engage your little investigators with hands-on learning that proves anyone can think like a scientist.

For our first MoLab Mondays!, we wanted to start with a subject familiar to all families – Slime! Our recipe uses ingredients found in most households and you'd be surprised with how much science you can cover with slime!

Tools & Materials:

- Mason Jar with lid
- Jar with lid that can hold 2 cups (for Borax mixture) – a repurposed peanut butter jar is perfect!
- White or Clear Glue
- Borax
- Food Coloring
- Water

Mixing Up Your Slime

We recommend using a mason jar to make your Slime. Mason jars have measurements on the side which makes mixing easy! Classico spaghetti sauces come in jars that work perfectly! You can make your Slime with either washable or non-washable glue.

- Ask your student to find the 4 oz line. Fill jar to 4 oz line with white glue (½ cup).
- Add water to 8 oz line (½ cup).
- Discuss color mixing combinations and choose a color for your slime. If you use white glue, keep in mind that you will never have red slime – it will be pink! Drop in food coloring to get desired color.
- Shake, shake, shake! Keep shaking until everything is evenly mixed.
- In a separate container, make a Borax mixture by mixing 1 ½ Tablespoons of Borax with 2 cups of water. This will make enough for 6 batches of slime. The Borax will only suspend into the water, so it is very important that you shake the mixture well in between each use.
- Immediately after shaking the Borax mixture, add 1/3 cup to the glue and water. Screw the lid on very tightly and shake vigorously! When your slime no longer coats the sides of the jar, it's ready!
- Do not eat your science! MoLab's Slime is **NOT** edible.

Try this with your slime!

- Poke it!
- Pound it!
- Roll it into a ball!
- Bounce it!
- Squeeze it!
- Squish it!
- Stretch it!
- Maybe even pour it!

Ask Your Student

1. What are the three states of matter?
2. What are the properties of each state?
3. What properties does your slime exhibit?
4. How would you categorize slime?

What's Going On?

Mixing up a batch of slime is a great way to review matter and chemistry concepts. Chemistry is the science that deals with the identification of the substances of which matter is composed; the investigation of their properties and the ways in which they interact, combine, and change; and the use of these processes to form new substances. Many people think of chemists as being white-coated scientists mixing strange liquids in a laboratory, but the truth is we are all chemists.

Matter is anything that takes up space. Everything is made of matter! A molecule is the smallest particle in a chemical element or compound that has the chemical properties of that element or compound. Molecules are made up of atoms that are held together by chemical bonds. Atoms are the building blocks of all matter.

H_2O
Water

A molecule of water is made up of two hydrogen atoms and one oxygen atom.

The three most common states of matter are solids, liquids, and gases. The molecular bonds in each state is different. In a solid the molecules are tightly bound together. This gives them a definite shape. The molecules in liquid are bound together a lot looser than those of a solid. Liquids take the shape of the container they are in. Gases also takes the shape of the container they are in. Gas molecules are not bound together at all.

Matter can be changed either chemically or physically. Water is cool because it is a substance that can form into all three states. When water freezes into a solid or heats up into water vapor, it is a physical change. When slime changes color it is a physical change. Chemical change is any change that results in the formation of new chemical substances. At the molecular level, chemical change involves making or breaking of bonds between atoms. Mixing your materials to make slime.

Dig a Little Deeper

Slime is a Non-Newtonian fluid. A Non-Newtonian fluid is neither a liquid nor a solid. It can be picked up like a solid, but it also will ooze like a liquid. Slime does not have its own shape. Slime can also change its shape to fill whatever container it's placed in. However, it can also be bounced like a ball because of its

elasticity. Pull the slime slowly and it flows more freely. If you pull it quickly, the slime will break off more easily because you are breaking apart the chemical bonds.

Slime is also a polymer! A polymer is made up of very large chains of molecules. The glue used in slime is made up of long chains of polyvinyl acetate molecules. These chains slide past one another easily which keeps the glue flowing. Chemical bonds are formed when you mix the glue and slime activator together. Slime activators (borax, saline solution, or liquid starch) change the position of these molecules in a process called cross linking! Instead of flowing freely, the molecules become tangled and create the slimy substance. Think wet, freshly cooked spaghetti versus leftover cooked spaghetti! Cross linking changes the viscosity.

What is Viscosity? Viscosity is the property of a liquid that describes how fast or slowly it will flow. You can think of viscosity as how thick a liquid is. A liquid with high viscosity - that is thick, like peanut butter - will flow slowly. A liquid with low viscosity, or that's thin, like water, will flow quickly (in other words, it will flow freely). You can experiment with the viscosity or thickness of your slime by adding more or less water.

Extension Activity: Ask your student(s) to order 4 items from high to low viscosity.
Peanut Butter, ketchup, vegetable oil, water

Happy Experimenting from MoLab, Inc!