



MoLab Mondays!

Stress Ball Science

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.

It's the fifth installment of MoLab Mondays! We all could use a little stress break about now. So, here is a fun hands-on science project that the whole family can enjoy. Get ready to use your mixology skills to assemble a stress ball that will provide hours of relief! It's a pretty straight forward lesson with materials that should be easy to round up.

Tools & Materials:

- Bowl
- Spoon
- Balloons (2)
- Corn starch
- Water
- Water bottle
- Funnel (optional)
- Sharpies (optional)

Constructing Your Stress Ball

- In the bowl, mix a cup of water with two cups of cornstarch. Use the spoon to stir the mixture until it is goeey and well mixed. You will know it is ready when you feel resistance when stirring quickly, and no resistance when stirring slowly.
- Pour the mixture into the water bottle. Use a funnel if you have one available.
- Attach the lip of the balloon over the top of the water bottle. Flip the bottle over and squeeze the contents into the balloon until it is full.
- Try not to let any air bubbles get into the balloon. Remove the balloon and tie it in a knot.
- Cut the neck off another balloon. Wrap this second balloon over the filled balloon to cover up the knot. This also makes the stress ball more durable.
- If you want to, use the sharpies to get creative and add a face to your stress ball!

Make Observations and Ask Your Student

- Why did you feel resistance when stirring the mixture quickly?
- What other materials could you have used to fill the balloon?
- How do you think the action of squeezing the ball relieves stress?

What's Going On?

The mixture that was used to fill the balloon is sometimes referred to as oobleck. This mixture is a non-Newtonian fluid and turns solid when pressure or force is applied. Sir Isaac Newton is famous for his scientific theories in mathematics and physics. He described how normal liquids have a constant viscosity (or flow). This means that their flow behavior only changes in temperature or pressure. Non-Newtonian fluids are strange and don't follow the same rules.

Non-Newtonian fluids change their viscosity under stress. In science, a stress is a force applied to an object. The result of that stress is strain. Newtonian fluids do not resist as much stress as a solid would, so they do not show the signs of strain. Imagine hitting water with a hammer. It doesn't resist much to that stress. A non-Newtonian fluid does react to stress with a change in viscosity. What will happen if you hit a bowl full of oobleck with a hammer? Instead of splashing, the particles lock together. When you apply stress to your non-Newtonian mixture, it reacts to the strain by getting thicker and acting like a solid. As you squeeze the stress ball the mixture will become more rigid and solid-like. When you release the pressure, it returns to its earlier state. Cool.

Dig a Little Deeper

How does the action on squeezing a stress ball help to relieve stress and anxiety? A psychological theory suggests that when we are under stress, we take information in through two channels. The first channel is the basic primal sensory channel. We approach the situation using sights, sounds, sensations, and smells. The second channel is intellectual. Our brains try to make sense of what's going on and put the situation into words and context.

A stress ball relieves stress simply because it keeps your hands busy doing a simple, repetitive movement which eventually becomes almost subconscious. Your stress or anxiety is redirected to the stress ball. In addition, they're also a great form of therapy for your hands. These oobleck filled balls boost blood circulation and help with the treatment of carpal-tunnel syndrome. They are used as a tool for simple meditation, as well as the redirecting of certain senses, therefore leading to focus and productivity.

Extension Activity Ideas

- Gather materials and make more stress balls using a variety of supplies. Beans and rice are other options. Ask your little scientists to experiment with the different stress balls. How do they react

to stress (or being squeezed) differently? Does one of them bounce better than the other? Which one is the most relaxing to squeeze?

- Another fun idea is to create a giant stress ball using a really big balloon. Follow the same procedure as before, just super-size everything. You will need more of the oobleck mixture and a larger bottle. A 2L should work well.
- Yoga and meditation are other forms of stress relief. These techniques help relieve stress by lowering blood pressure and lowering your heart rate. Look for videos online or local studios conducting online classes!



Happy Experimenting from MoLab, Inc!