

## SCIENCE FESTIVAL FACILITATOR'S GUIDE



### Sticky Icky!

#### 1. Make sure you have the materials you need.

- White school glue
- Food coloring (various colors)
- Borax (found in the laundry aisle)
- Two pitchers: One labeled “Borax Solution,” one labeled “Water Only”
- Warm tap water
- Plastic Tablespoons (some for water, some for glue)
- Plastic Teaspoons (for Borax solution)
- Six-ounce plastic cups (one for each student-adult pair)
- Popsicle sticks (one for each student-adult pair)
- Safety glasses

#### 2. Watch this video on your smartphone:

<https://youtu.be/RQDIW1IFkT0>

#### 3. Prepare your station.

- In the pitcher labeled “Borax Solution” mix one pint of warm tap water and two tablespoons of Borax. Stir well.
- Fill the “Water Only” pitcher with plain warm water.
- Distribute plastic cups and popsicle sticks, one each per student-adult pair. Have food coloring, pitchers, and measuring spoons available to share.
- If you have time, look around the room for examples of polymers to show students: plastic pens, calculators, cell phone cases, synthetic fabrics and rubber-soled shoes are all options.

**spark. inspire. engage.**

### Questions to ask participants before they start:

- What do rubber, silk, concrete and plastic have in common? Let's find out!
- Bonus: Pass around examples of different materials made of polymers: a plastic cell phone case, a rubber-soled shoe, a toothbrush or a shirt made from rayon.

### Instructions:

Please read each set of instructions out loud. Make sure that you direct the correct person to complete each assigned task.

- **Adult:** In your plastic cup, mix one Tablespoon of plain warm tap water with one Tablespoon of white glue.
- **Student:** Stir well with a popsicle stick. Tell your partner which color to use for the next step.
- **Adult:** Add a few drops of food coloring to the glue and water mix.
- **Student:** Stir well with a popsicle stick, keep stirring during the next step.
- **Adult:** Slowly pour two teaspoons of the Borax solution into the glue and water mixture.
- **Student:** Keep stirring until there is no liquid left.

### How It Works:

The glue and water mixture contains chains of molecules, called “polymers,” which move relatively freely as a liquid. When the Borax solution is added, it acts as a “cross-linker,” binding the polymer chains together and restricting their movement. It is this molecule in the Borax solution that causes the liquid to turn into sticky icky.

### Vocabulary:

**Polymer:** Natural and synthetic substances with a molecular structure that has lots of similar units bonded together, such as plastics, glass, concrete and rubber.

### Real-World Application:

One characteristic of polymers is that—like Sticky Icky—they can easily take a variety of shapes. We see polymers all around us: in our plastic toothbrushes, cell phone cases, rubber-soled shoes, and even synthetic fabrics made into clothes and sheets!