

Demonstrations with Elmer's Glue

Teacher Instructions

Energy Transformation

Materials

- Elmer's Color Changing glue (heat)
- Two large steel ball bearings (2-inch diameter) or 2 small dumbbells
- Foamboard
- Putty knife

Procedure

Day before

1. Prepare the foamboard by smearing Elmer's Color Changing glue over one side with a putty knife.
2. Allow the glue to dry overnight

During class

3. Hit the two steel ball bearings (or dumbbells) together to create a sound. Ask the students to discuss where the energy for the sound came from.
4. Lead the students to conclude that some kinetic energy transformed into sound energy during the collision.
5. Ask the students to discuss if there are any other forms of energy produced during the collision. Hopefully, a student will suggest that heat was produced.
6. Tell the students that we can test for the heat with the Elmer's glue product, it will change from purple to pink if it gets hotter.
7. Ask for a student to volunteer to hold the glue covered foamboard so that the class can see.
8. Hit the foamboard between the ball bearings to create a pink circle at the impact site.

Energy of Lightsabers

Materials

- Elmer’s Color Changing glue (sunlight)
- Red flashlight
- UV flashlight
- Rolled white printer paper
- Tape
- Foamboard
- Putty knife

Procedure

Day before

1. Prepare the “lightsabers” by rolling a piece of printer paper around the end of each flashlight and securing with tape.
2. Create the “lightsaber energy detecting screen” by smearing Elmer’s Color Changing glue over a piece of foam board with a putty knife. Allow to dry completely.

During class

3. Turn out the lights in the classroom and turn on the “lightsabers.” Ask the students to discuss which lightsaber is more powerful, Darth Vader’s red lightsaber or Luke Skywalker’s blue lightsaber.
4. After students share, tell them that you have a device that can detect the energy of a lightsaber. A high energy lightsaber will change the color of the detecting screen, but a low energy lightsaber will not.
5. Shine the red lightsaber on the “energy detecting screen” to show that nothing happens.
6. Shine the blue lightsaber on the “energy detecting screen” to reveal a color change.

Secret Messages with Elmer's glue stick

Materials

Teacher Demo

- Elmer's Disappearing Purple glue stick
- Notecard
- Vinegar
- Paintbrush

Student Activity

- Elmer's Disappearing Purple glue stick
- Notecards
- Cotton swabs
- Vinegar
- Ammonia
- Soapy water
- Lemon juice
- Blowdryers

Procedure

Day before

1. Prepare the notecard by writing a message using a paintbrush dipped in vinegar. Allow the vinegar to dry overnight

During class

2. Tell the students that today in class, we are going to try and figure out how Elmer's Disappearing Purple glue works, and first, we'll just apply some to a piece of paper to see it in action.
3. Use a document camera so students can see the message instantly appear when you apply the glue stick to the previously prepared notecard.
4. You can act puzzled by the message, as if you didn't know it was going to happen.
5. Put the students into small groups and supply them with the materials listed above to see if they can replicate what happened in the demonstration.
 - a. Vinegar and lemon juice will both have the same effect, so you can prompt students to discuss what those substances have in common (leading to the discovery that acids take away the purple color and introducing the concept of acid-base chemistry and indicators)