

TEKS-Based Activity for Grade 6

Oobleck, Goop, and Glurch

Description:

In this activity, students compare the physical properties of several substances.

Time Frame:

2 lessons (45 minutes each)

Correlation to Texas Essential Knowledge and Skills:

During this activity, students will be exposed to the following Texas Essential Knowledge and Skills:

Note: Some TEKS statements below end with a ; or *and* and nothing thereafter—this indicates that further TEKS statements follow but are not included here.

(6.7) Science concepts. The student knows that substances have physical and chemical properties. The student is expected to:

(B) classify substances by their physical ~~and chemical~~ properties.

Note: The TEKS listed here is the main content TEKS for this activity; however, this activity may also cover additional content and process skills included in other TEKS

Materials:

Metric measuring spoons (1 set per student group)

Hand lens (1 per student group)

Safety goggles (1 per student)

Liquid starch (60 mL per student group)

Table salt (2 g per student group)

Cornstarch (150 mL per student group)

Water

Elmer's® white school glue (1 small bottle per group plus a large bottle to make the glue mixture)

Borax powder (1 box per class) (this can be found in the laundry supply aisle as 20 Mule Team® Borax)

Clear 16-oz. plastic cups (7 per student group and 6 for materials distribution center)

Paper towels (1 roll)

Zipper-type freezer sandwich bag (4 per student group)

Wax paper (about 1 m per student group)

Ruler (1 per student group)

Marker (1 per student group)

Oobleck, Goop, and Glurch student investigation pages (included at the end of this activity)

Note: The extra amounts/quantities for the items listed above are for students to use when they alter their recipes.

Advance Preparation:

1. Prepare a glue mixture by combining equal parts water with equal parts Elmer's white school glue so that each student group has 60 mL of the mixture. Be sure to use Elmer's white school glue, as it contains a polymer known as polyvinyl acetate that is at a specific dilution rate.
2. Prepare a borax solution by adding 20 mL of borax to a liter of water so that each student group has 90 mL. Some borax powder may settle to the bottom of the container, so be sure to stir the borax to dissolve as much of it as possible.
3. Prepare copies of the Oobleck, Goop, and Glurch student investigation pages for each student group.
4. Set up a materials distribution center so that students can easily collect the materials for this activity. Set out the borax solution, glue mixture, plain water, salt, liquid starch, and cornstarch in appropriately labeled 16-ounce plastic cups at the materials distribution center. Also set out the roll of paper towels, small bottles of glue, and the clear plastic cups for each group.

Procedures:

SAFETY: Students must wear eye protection during this investigation. They should neither taste nor smell any of the materials.

1. Have students complete the Oobleck, Goop, and Glurch investigation pages.
2. Ask students to describe how they changed their recipes and report their results. Guide student responses so that they conclude that changing the input into a system will change the output, or results.

Oobleck, Goop, and Glurch

Materials:

Set of metric measuring spoons

Hand lens

Safety goggles

30 mL liquid starch

30 mL glue mixture

1 table salt

75 g cornstarch

30 mL water

30 mL white glue

30 mL borax solution

7 plastic cups

3 zipper-type sandwich bags

1 m of wax paper

Ruler

Marker

Procedures:

SAFETY: Wear eye protection and do not taste or smell any of the materials.

1. At the materials distribution center, get 7 plastic cups. Label the plastic cups with the names *starch*, *white school glue mixture*, *table salt*, *cornstarch*, *water*, *white school glue*, and *borax solution*. Place a small sample of each material in its labeled plastic cup (see the necessary sample amounts in the materials list above). Be sure to wash and dry the measuring spoon with water and a clean paper towel after each use.
2. Observe the physical appearance of each sample of material. Construct a table to record your observations of the physical properties of the starch, white glue mixture, table salt, cornstarch, water, white glue, and borax solution. Include descriptions of what you see, hear, and feel.
3. Now you will observe how these materials interact with each other. Carefully follow the directions for each gunk recipe. Mix and test the *Glurch* recipe first. Then mix and test *Oobleck*, and finally mix and test *Goop*.

Glurch

30 mL liquid starch
30 mL glue mixture
1 g table salt

Mix the starch and table salt together in the sandwich bag. Knead the bag for 2-3 minutes until the substances are well mixed. Then add the white glue mixture, again kneading the bag until the substances are well mixed. When a lump forms and it is hard to knead, take the lump out of the bag and squeeze out any excess liquid into a waste container.

Oobleck

75 g cornstarch
30 mL water

Add the water to the sandwich bag. Next, slowly add the cornstarch a little at a time to the water. Knead the bag to mix the substances together, making sure all of the cornstarch is wet. You may need to add a little more or less cornstarch so that the oobleck has a consistency light enough so it will flow through your fingers but solid enough to squeeze.

Goop

30 mL white glue
30 mL borax solution

Squeeze approximately 30 mL of white glue [not the glue mixture] into one corner of a zipper-type sandwich bag. Add 30 mL of borax solution. Seal the bag and then knead the contents until a new substance is formed. Make certain both substances are thoroughly mixed together.

4. Test each gunk recipe three times using the science methods listed below. Record your results in the table.

Roll Test

Roll your gunk into a snake on the wax paper and see how long a skinny snake you can make before it breaks. Measure the length to the nearest centimeter.

Pancake Test

Press your gunk into a pancake on the wax paper. Make the largest pancake you can, but you must be able to lift it off of the wax paper without it breaking apart. Measure the diameter of your pancake to the nearest centimeter.

Bounce Test

Roll your gunk into a ball and drop it from the height of your desk. Measure the distance, to the nearest centimeter, that it bounces back up from the floor.

Stretch Test

Roll your gunk into a ball and then pull it apart to see how far you can stretch it before it breaks. Measure the distance of the stretch to the nearest centimeter.

Glurch Test Results

	Test 1	Test 2	Test 3	Average
Roll test (nearest cm)				
Pancake test (nearest cm)				
Bounce test (nearest cm)				

Oobleck Test Results

	Test 1	Test 2	Test 3	Average
Roll test (nearest cm)				
Pancake test (nearest cm)				
Bounce test (nearest cm)				

Goop Test Results

	Test 1	Test 2	Test 3	Average
Roll test (nearest cm)				
Pancake test (nearest cm)				
Bounce test (nearest cm)				

5. Why do you test each recipe three times instead of just once?

6. On what test does *Glurch* do best?

Oobleck?

Goop?

7. How would you change the recipe for either *Glurch*, *Oobleck*, or *Goop* to make the results for one of the tests even better? Tell your teacher which substance (*Glurch*, *Oobleck*, or *Goop*) your group will modify. Record your new recipe below. Remember to change only one variable in your recipe. If you want to change more than one variable, make another recipe. Get the additional materials you need to test your recipe. Construct a table to report your test results.

