

Title - **GLUBBER AND GLUE PUTTY**

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Primary Subject - Science

Secondary Subjects - Science

Grade Level - 5 - 8 (adaptable)

SCIENCE PROJECT OF THE WEEK

GLUBBER AND GLUE PUTTY

PROBLEM: What happens when I combine Borax or laundry starch with white glue?

RESEARCH: Find out the difference between monomers and polymers.

HYPOTHESIS: Have you ever played with Silly Putty? Based on your research, why do you think it stretches so much?

MATERIALS: 3 tablespoons Faultless powdered starch (scented, gloss, or any other brand of starch will not work)

1 tablespoon Borax

2 cups hot water (but only as hot as it comes from the tap)

A paper or plastic cup

A spoon

A measuring cup

A bowl

½ cup white glue (Elmer's Glue-All or Elmer's School Glue works best)

2 self-sealing plastic bags to store the Glubber and the Glue Putty

PROCEDURE:

PART 1: GLUBBER

1. Mix three tablespoons of starch and 1 cup of hot water in a bowl, stirring well with the spoon.
2. Pour ¼ cup of the glue and ¼ cup of water into the cup.
3. Press it and mix it with the spoon for about one minute until a thick material forms.
4. Remove the Glue Putty from the cup.
5. Hold it over the sink to let any remaining liquid drain off the putty.
6. Shape it into a ball. Does it bounce?
7. Let the ball sit on the table. Describe what happens during the next five minutes.
8. Pull some of the Glue Putty slowly between your hands. How much does it stretch? Let go and describe what happens.
9. What happens when you pull it hard and fast?

PART II: GLUE PUTTY

1. Repeat step 1 above using Borax in place of the starch. It is OK if some crystals remain in the bottom of the bowl.
3. Pour ¼ cup of white glue and ¼ cup of liquid into the bag, leaving the crystals that did not dissolve in the bowl.
5. Seal the bag and squeeze gently to mix. The glue will form a solid lump.

6. Keep squeezing for about a minute after the glue starts to form the lump.
7. Open the bag and hold it over the sink to let any remaining liquid drain off.
8. Shape the Glubber into a ball. Does it bounce? How is it different in the way it bounces to the Glue Putty?
9. Let the ball sit on the table. Describe what happens during the next five minutes.
10. Try pulling some of the Glubber slowly between your hands. Does it stretch? Let go and see if it will snap back.
11. What happens when you pull it hard and fast?
12. Describe the ways the Glue Putty and the Glubber are the same and how they are different.
13. Are the two substances more like a liquid or more like a solid?

ENRICHMENT: You have enough of the Borax solution and the starch solution to repeat these steps three more times. Try diluting the solutions by adding more water. Take the remaining solutions and add $\frac{3}{4}$ cup of water. Follow the instructions above. Take the remaining solutions again. You should have $\frac{1}{2}$ cup left. Add $\frac{1}{2}$ cup more of water and follow the instructions again. Describe any changes that you see in the Glubber and the Glue Putty for each trial. If your results are too sticky, add a little more of the Borax or starch solution.

CAUTION: Be very careful not to let the Glubber or Glue Putty get on clothes or furniture. It will not come out easily.

DATA: Be sure to make a note of any changes that happen at each step of the procedure.

CONCLUSION: This is not optional. You must explain what you learned by doing this activity. Remember that you must answer the question you asked in your original problem statement.

NOTE: BE SURE TO HAVE YOUR PARENT OR GUARDIAN SIGN YOUR WORK.
PARENTS: YOUR SIGNATURE SHOWS YOUR STUDENT HAS DONE THE WORK.

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