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# SILLY PUTTY LAB

By Kim Taylor-Papp – Northville High School

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## **Teacher Notes:**

This is my favorite first day back activity. Rather than go over policies and procedures, I like to get the kids into the lab working right away. In order to complete the experiment students have to figure out the clues on the small slips of paper. These slips of paper have are photocopied onto seven different pieces of colored paper. Next, I use a variety of scissors with different cutting edges (scrapbooking scissors work best) and cut each paper, on the lines, into four strips leaving me with 28 strips of paper. I place all strips in a paper box and walk up and down the aisles. Each strip of paper is randomly selected by each student. Students who have chosen strips of paper of the same color have to find each other because they are lab partners. They, then, have to fit their strips of paper together like pieces to a puzzle (given the cut edge resulting from the scrapbooking scissors with different edges) to determine the order in which the directions are to be followed. Next, they have to work cooperatively and brainstorm with one another. All materials needed are placed on a cart in the front of the room. Given the clues on their strips of paper, they have to figure out what is needed to make the silly putty. Once made, students answer a handful of questions.

## **One cart for the students has the following materials (Materials supply 7 lab tables):**

- 7- paper cups
- 7-tongue depressors
- 14-(7-30 ml and 7-100 ml) graduated cylinders
- 7-500/1000ml flasks w/the higher viscosity solution
- 7-50 ml beakers w/lower viscosity solution, and food coloring

Before the students gather the materials, they make a correlation between what is listed on their strip of paper and what is shown on the cart. I stand behind the cart. I do not let the students grab the materials until they make that correlation.

- paper cups (the 1st item)
- tongue depressors (the 2nd item)
- 100 ml graduated cylinders (not described BUT needed for the high viscosity solution)
- higher viscosity solution = glue solution (3rd item . . . 1.5 cups=355.5 ml of hot water added to 2 cups=474 ml of glue its the recipe I prefer . . . recipe can be double, tripled, etc.)
- 30 ml graduated cylinder (not described BUT needed to measure the lower viscosity solution)
- lower viscosity solution = starch solution= 4th item (2 tbsp of borax added to 1 1/3 cups= 237 ml of hot water)
- Starch solution is then distributed into 7-50 ml beakers.
- food coloring (5th item)

### **ABOUT THE AUTHOR**

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# SILLY PUTTY LAB - LAB SHEET

An Experience in Cooperative Learning

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Procure a cylindrical container of cellulose pulp coated with a compound of glycerol and fatty acids

**Secure a length of thick fibrous material originally found in the supporting structure AND water conducting membranes of trees and shrubs**

**Dispense 100 ml of the higher viscosity solution provided into your cylindrical container**

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ADD 20 ML OF THE LOWER VISCOSITY SOLUTION TO THE CONTENTS OF THE CONTAINER

**Alter the chromatic characteristics of the defined solution just enough to provide a pleasing visual stimulus**

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**Impart physical agitation to the mixture until a uniform consistency is achieved**

USING EIGHT DIGITS AND OPPOSABLE THUMBS, REMOVE THE CONTENTS OF THE CYLINDER AND MANIPULATE IT TO A HOMOGENOUS MASS

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1. Determine the physical properties of your product (appearance, texture, color, odor, and density, solid, liquid or gas).
2. The strength of a material refers to the material's ability to resist an applied force.
  - A. Analyze compression characteristics-is a pushing force; does the mass compact as a result of compression
  - B. Analyze tensile strength-is a pulling force that tends to produce stretching of a material by pulling the material in both directions.
  - C. Analyze its elasticity-a type of deformation that is reversible. Once the forces are no longer applied, the object returns to its original shape. Does your material bounce?
3. Is your Silly Putty thixotropic or dilatant? Justify your answer

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1. Physical properties of your product =

2. Compression characteristics=

3. Tensile strength=

4. Elasticity=

5. Is your Silly Putty thixotropic or dilatant? Justify your answer

Group Members

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_