

Fabulous Fabrics

Student Worksheet

Name: _____

Date: _____

Pre-lab Questions

1. Use this space to copy the two lists of fabrics you made as a class. Label each list with a category heading.
2. With your group, brainstorm some variables involved in dyeing fabric. List your ideas here.
3. With your group, brainstorm how you can tell the fabrics apart. List your ideas here.

Lab Materials

- 2 multi-fiber ribbon strips
- Microscope or magnifying glass
- 2 plastic cups
- Kool-Aid powder
- Digital scale
- 100-mL beaker for water
- 50-mL beaker
- 6 strips each of red and blue litmus paper
- 2 Plastic pipettes
- Safety glasses
- Stirring rod/spoon
- Permanent marker
- Paper towels
- 30 ml Ammonia or vinegar (from teacher)

Lab Procedure & Data Collection

1. Take turns using the microscope or magnifying glass to analyze the multi-fiber ribbon.
2. Refer back to your brainstormed list of how to tell fabrics apart and make any changes or additions you now have.
3. Put on your safety glasses.
4. Label your two cups "1" and "2" with a permanent marker.
5. Use the digital scale to weigh 0.7 grams of Kool-Aid (dye) into each cup.
6. Use the 100-mL beaker to measure 50 mL of water; pour it into Cup 1 and stir with a stirring rod or spoon.
7. Measure 30 mL of water, pour it into Cup 2, and stir.
8. Pause for class discussion.
9. Fill out the data table with your predictions for the fabrics dyed in an acidic solution and a basic solution, using the star rating system (explained above the data table).
10. Submerge one fabric strip into Cup 1, then set timer for 10 minutes.
11. Obtain either ammonia or vinegar from your teacher (based on the class consensus) in your 50-mL beaker and begin adding it in 5-mL increments using pipette (approximately 5 full pipettes) to Cup 2. Use your litmus paper to test when you have added enough to change your solution's pH.
12. Submerge your second fabric strip into Cup 2 and start a timer.
13. After 10 minutes, remove your first strip from Cup 1 and place it on a paper towel.
14. Examine your first fabric strip and fill out your data table with your observations.
15. After 10 minutes, remove your second strip from Cup 2, place it on a paper towel, and complete your data table with your observations.

Fill in the table using the star scale below to predict how well each fabric will dye. Your teacher will tell you what each fabric type is and where it is located. Make sure to record this information in the table. Next, fill in the table using the star scale below to predict how well each fabric will dye.

☆ = will not dye well

☆☆ = will dye lightly

☆☆☆ = will dye moderately

☆☆☆☆ = will dye well

☆☆☆☆☆ = will dye excellently, with vibrant, dark color

Name of fabric	Natural or synthetic?	Predicted dye rating: acidic solution	Actual dye rating: acidic solution	Predicted dye rating: basic solution	Actual dye rating: basic solution

Discussion Questions

1. In question 2 above, you listed some variables involved in dyeing fabric. Which variable(s) did you test in today's lab?
2. How did pH affect the dyeability of each of the fabrics? What patterns, if any, did you notice?

3. Looking at your results, what was surprising?

4. In your own words, what is green chemistry?

5. Imagine you are a green chemist responsible for manufacturing a shirt to sell to eco-conscious consumers. Your shirt must be dyed with the same red dye as found in Kool-Aid. Which fabric would you choose to make your shirt out of? Would you dye the fabric in acidic or basic conditions? Justify your answers.