POPPY SCHOLARS · BIOLOGY: THE LIVING EARTH

Home lab 7 · Unit 7 · about 45 minutes

Can you see DNA with no special equipment, and what does each step of the recipe do?

Name _____ Date _____

MATERIALS

You supply everything. Tick each item as you gather it.

- ☐ 3 strawberries, or equal 30 g amounts of strawberry, banana and onion for comparison
- ☐ 3 zipper bags or cups for mashing
- ☐ Dish soap (about 1 tablespoon per sample), table salt (1/4 teaspoon), and water
- ☐ A coffee filter or paper towel, and 3 clear glasses
- ☐ Rubbing alcohol (isopropyl, 70 percent or higher), kept in the freezer for at least an hour
- ☐ A ruler in millimeters, a spoon and a kitchen scale

SAFETY

Rubbing alcohol is flammable and poisonous: keep it away from flames and heat, never drink it, and keep it away from children and pets. Work near open air. Wash your hands afterward. Throw the mixtures away down the drain with plenty of water.

PROCEDURE

1. Weigh out the same mass (30 g) of each food and mash it very thoroughly in its own bag or cup.
2. For each sample, mix 1 tablespoon of dish soap, 1/4 teaspoon of salt and 1/4 cup of water, and add it to the mashed food. Stir gently for 2 minutes without making foam.
3. Pour each mixture through a coffee filter into a clean glass, collecting the liquid.
4. Tilt each glass and slowly pour cold alcohol down the side so that it floats in a layer on top of the liquid, about as deep as the liquid. Do not stir. Wait 5 minutes.
5. Look at the boundary between the layers. The white strands and clumps are DNA with some other molecules. Measure the thickness of the white layer in millimeters, and describe it.
6. Write down what each ingredient did, based on what you know about cell membranes and DNA.

RECORD YOUR DATA

Food	Mass (g)	White layer thickness (mm)	Description
Strawberry			
Banana			
Onion			

LAB REPORT

Write a report that gives your table, says what each ingredient did and why, and states what your comparison of foods does and does not show. A result that varies by food is not by itself evidence about how much DNA each food has, so say what you would need to measure to claim that.

Report the numbers you actually got, even when they disagree with the lesson. Write on the lines, or type your report on the website and send it to a teacher there.

Question and hypothesis *State the question in your own words, what you expect to happen, and why you expect it.*

Method *What you changed, what you measured, what you kept the same, and how many trials you ran.*

Observations *Describe what you saw, including anything unexpected. Your data tables are added to the report automatically.*

Calculations *Show each calculation step by step, with units.*

Claim and reasoning *Answer the question using your numbers, then explain why, using the biology from the unit.*

Limits and next step *What could have affected your results, and one change you would make next time.*