

7th Grade Science DNA Extraction Lab

Names _____ Date _____

DNA Extraction: Strawberry

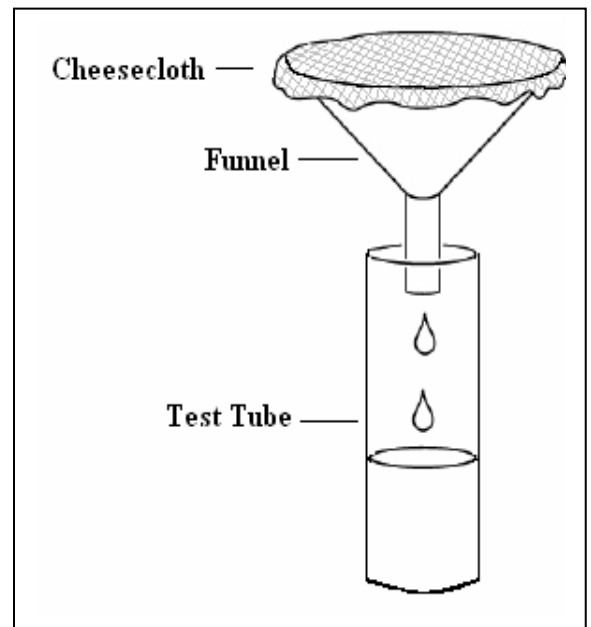
Background: The long, thick fibers of DNA store the information for the functioning of the chemistry of life. DNA is present in every cell of plants and animals. The DNA found in strawberry cells can be extracted using common, everyday materials. Strawberries are considered Octoploids because they have 8 pairs of Chromosomes. That is a lot of DNA for a plant to have. We will use an extraction buffer containing salt, to break up protein chains that bind around the nucleic acids, and dish soap to dissolve the lipid (fat) part of the strawberry cell wall and nuclear membrane. This extraction buffer will help provide us access to the DNA inside the cells.

Pre-lab questions:

1. What do you think the DNA will look like?
2. Where is DNA found?

Materials:

heavy duty ziploc bag
1 strawberry
10 mL DNA extraction buffer (soapy, salty water)
cheesecloth
funnel
50mL vial / test tube
glass rod, inoculating loop, or popsicle stick
10 mL ethanol
3 mL Dropper



Procedure:

1. Place some strawberries in a Ziploc bag and close it good.
2. Smash/grind up the strawberry using your fist and fingers for 2 minutes. *Careful not to break the bag!!*
3. Add the provided 10mL of extraction buffer (salt and soap solution) to the bag using the dropper.
4. Knead/mush the strawberry in the bag again for 1 minute very slowly so no suds are seen.
5. Assemble your filtration apparatus as shown to the right. Place the cheesecloth in the center of the funnel so that the cheesecloth covers the entire funnel.
6. Pour the strawberry slurry into the cheesecloth filtration apparatus and let it drip directly into your

test tube. You may need to fold up the sides of the cheesecloth and gently squeeze the strawberry matter so that juice flows out into the test tube.

8. You will need to fill at least $\frac{1}{2}$ of your test tube with the strawberry liquid.

9. When you have enough liquid in the test tube, throw the cheese cloth in the container provided by Mr. Hanson and put the funnel in the container provided by Mr. Hanson.

10. Tilt the test tube. Mr. Hanson will slowly pour 10 mls cold ethanol into the tube. **OBSERVE**

11. Dip the loop or glass rod into the tube where the strawberry extract and ethanol layers come into contact with each other. **OBSERVE**

Conclusions and Analysis

1. It is important that you understand the steps in the extraction procedure and why each step was necessary. Each step in the procedure aided in isolating the DNA from other cellular materials. Match the procedure with its function:

PROCEDURE

- A. Filter strawberry slurry through cheesecloth
 - B. Mash strawberry with salty/soapy solution
 - C. Initial smashing and grinding of strawberry
 - D. Addition of ethanol to filtered extract
- Membranes

FUNCTION

- ___ To precipitate DNA from solution
- ___ Separate components of the cell
- ___ Break open the cells
- ___ Break up proteins and dissolve cell

2. What did the DNA look like? Relate what you know about the chemical structure of DNA to what you observed today.

3. Explain what happened in the final step when you added ethanol to your strawberry extract. (*Hint: DNA is soluble in water, but not in ethanol*)

4. A person cannot see a single cotton thread 100 feet away, but if you wound thousands of threads together into a rope, it would be visible much further away. Is this statement analogous to our DNA extraction? Explain.

5. Why is it important for scientists to be able to remove DNA from an organism? List two reasons.

6. Is there DNA in your food? _____ How do you know?