



California State University of Bakersfield, Department of Chemistry

Snotty Spinach



Standards:

5-PSI-1: Structure and Properties of Matter: Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects.

4-ESS3-1: Cause and Effect: Cause and Effect relationships are routinely identified and used to explain change

Introduction:

Learn about the process of DNA extraction through this simple experiment. This experiment requires few materials that are easily found around the household or classroom. It enables students to relate facts about DNA from their textbook to observe DNA hands-on.

Materials:

- spinach
- blender
- water
- liquid detergent
- meat tenderizer
- rubbing alcohol

This material is based upon work supported by the CSUB Revitalizing Science University Program (REVS-UP) funded by Chevron Corporation. Opinions or points of view expressed in this document are those of the authors and do not necessarily reflect the official position of the Corporation or CSUB.

- beaker or glass container
- stirring rod

Safety:

- Always have an adult with you to help you during your experiment.
- Always wear eye protection and gloves when doing chemistry experiments

Procedure:

1. Put about half a bag of spinach in a blender. Add just enough water so that it blends quickly (about ½ cup, add more as necessary). The consistency should look like thin pea soup.
2. Strain the “soup” into another container. Save the soup.
3. Take the amount of soup and add about ¼ that amount of liquid detergent (any kind) and start stirring. The detergent lyses the cell membrane and the nuclear membrane.
4. Add about 1 spoonful of enzymes (meat tenderizer) and stir gently for at least 5 minutes. The enzymes break off most of the protein from the DNA strands.
5. Fill a small glass container half full with the clean and tenderized cell scum.
6. Tilt the jar and slowly pour an equal amount of rubbing alcohol down the side of the jar so that it forms a layer on top of the cell scum. Pretty soon you will see white stringy, snotty stuff rising up from the cell scum. That is the DNA. Use a stirring rod to collect the DNA.

Data and Observations:

Record your observations in this space

Questions:

1. How long did it take to see results?

2. What did you observe?

3. Do other vegetables work?

References:

1. Thousands of worksheets, educational games, and more!. (n.d.). *Education.com*. Retrieved August 4, 2014, from <http://www.education.com>

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