

Instruction and Student worksheet: Viewing Broccoli DNA



Student Name: _____

What do cow breeding, crime investigations and nutrient-loaded broccoli have in common?

Deoxyribonucleic acid (DNA). DNA is a unique code found in the cells of all living things. By studying DNA we are able to:

- Breed cattle that produce more milk
- Link people to crime scenes, by proving they were there
- Increase the nutrient content of broccoli (so you don't have to eat as much!)

DNA is so important, yet so tiny. How do we know it is really there? This experiment allows you to see some clumps of DNA, without microscopes or other scientific equipment.

In this experiment you will:

1. Physically break up the raw broccoli - with salt and a blender
2. Break the cell and nucleus membranes from the broccoli cells with the detergent
3. Free and uncoil the DNA - with enzymes in meat tenderiser
4. Collect the broccoli DNA - using rubbing alcohol.



The first 3 steps can be completed as a whole class group or prepared before the experiment.

1. Prepare your broccoli soup: add 1 cup of chopped raw broccoli to 2 cups of water. Add a good pinch of salt.
2. Blend for 15 seconds. Strain the broccoli soup into the measuring jug and add 2 tablespoons of dishwashing detergent. Mix gently for a minute.
3. Next, pour the broccoli water into the small glass jars or test tubes to about 1/3 full.
4. Add a pinch of meat tenderiser and gently swirl to mix.
5. Tilt the jar and pour some rubbing alcohol down the inside of the jar/test tube. Pour an equal volume to the amount of broccoli water. (By pouring down the inside of the jar, you avoid mixing the alcohol and broccoli water.)
6. Allow the jar to stand for 3-5 minutes. You should be able to see bubbles in the alcohol layer, then white 'clouds' or strands will form. This is the DNA! Gently swirl the toothpick in the solution to collect the DNA strands.



Discussion Questions:

1. Develop a flowchart, with images and text, showing the steps involved in viewing broccoli DNA.
2. What was the most difficult step? Explain your answer.
3. List 5 other things you could extract DNA from. Would you expect the DNA to look the same or different in each case? Why?