

FULTON FRESH KITCHEN SCIENCE

Strawberry DNA

In this experiment we'll be able to see DNA - without a microscope!

SAFETY FIRST! Youth should always have parent supervision when performing science experiments.

MATERIALS

- Resealable plastic bag
- 2 strawberries
- 2 tsp liquid dish detergent
- 1/2 cup water
- 1 tsp table salt
- 2 plastic cups
- 1 coffee filter
- 1/2 cup cold rubbing alcohol
- 1 coffee stirrer
- Measuring spoons

PROCEDURE

1. Remove any green leaves on the strawberries.
2. Put the strawberries into the plastic bag, seal it, and gently smash it for about two minutes. Completely crush the strawberries. This starts to break open the cells and release the DNA.
3. In a plastic cup, make your DNA extraction liquid: mix together 2 tsp of dish detergent, 1 tsp of salt, and 1/2 cup of water.
4. Add 2 tsp of the DNA extraction liquid into the bag with the strawberries. This will further open up the cells.
5. Reseal the bag and gently smash for another minute (avoid making too many soapy bubbles).
6. Place the coffee filter inside the other plastic cup. Open the bag and pour the strawberry liquid into the filter. You can twist the filter just above the liquid and gently squeeze the remaining liquid into the cup.
7. Gently pour an equal amount of cold rubbing alcohol as there is strawberry liquid down the side of the cup. Do not mix or stir. You have just isolated the DNA from the rest of the material contained in the cells of the strawberry.
8. Within a few seconds, watch for the development of a white cloudy substance (DNA) in the top layer above the strawberry extract layer.
9. Tilt the cup and pick up the DNA using the plastic coffee stirrer.

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Strawberry DNA

What do you call strawberries playing the guitar? A jam session!

DID YOU KNOW?

DNA stands for deoxyribonucleic acid and is the genetic materials found within the cells of most living organisms. It provides the “instructions” for organisms to grow, live, and reproduce. DNA is made up of macromolecules called nucleotides. Each nucleotide contains a phosphate group, a sugar group, and a nitrogen base. The four types of nitrogen bases are adenine (A), thymine (T), guanine (G) and cytosine (C). DNA is composed of two chains that twist around each other to form a double helix. The double helix arrangement resembles a spiral staircase in which the paired nitrogen bases form the steps and the sugar-phosphate backbones form the rails. The order of the nitrogenous bases is what determines DNA's instructions or genetic code. How does this experiment work? The soap breaks down the lipid bilayer of the cell membrane. The salt removes proteins that are attached to the DNA. The alcohol precipitates the DNA out of the solution. The DNA is not soluble (meaning it cannot dissolve) in the alcohol layer.

LEARN MORE

Dive deeper into our cells by learning more on the Brain POP website (<https://www.brainpop.com/science/cellularlifeandgenetics/dna/> - best for younger students) and the NIH Genetics Home Reference website (<https://ghr.nlm.nih.gov/primer/basics/dna> - best for older students).

CAREER CONNECTION

Exploring DNA is available in a wide variety of careers - everything from a geneticist, to forensic scientist, to plant scientists, and biochemist. The opportunities are endless - just like the possible genetic combinations of our DNA!

This lesson was adapted from activities from the NIH National Human Genome Research Institute (How to Extract DNA from a Strawberry) and Georgia 4-H (DNA Discoveries).

Share a picture of your experiment with us on social media with the hashtag #localfoodmadefun.

Visit our website or social media channels for a follow-along video of this experiment.

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