

Strawberry DNA Extraction Activity

*Brought to you by the National Institute of Justice's
Forensic Technology Center of Excellence (FTCOE)*

Have you ever wondered how forensic scientists analyze DNA? Well, you'll learn to extract DNA from strawberries just like experts in the lab, unlocking the same scientific magic that helps solve real-world cases! DNA, short for Deoxyribonucleic Acid, can be referred to as the "building block of life" because it provides the instructions for our cells, organs, and systems to operate. DNA is housed in the nucleus of the cell, so forensic scientists have to break open the cells and nuclei to release the DNA to analyze it. Strawberries are perfect for demonstrating this process because they have a lot of DNA to extract. In fact, each strawberry cell contains 8 copies of DNA, while a human cell contains only 2 copies.

The materials that we will use each have a specific purpose in extracting the strawberry DNA. The liquid dish soap makes the cells and nuclei burst open, releasing the DNA. The salt helps ensure that the proteins in the cells are kept separate from the DNA. Lastly, isopropyl rubbing alcohol causes the DNA to clump together and makes the strawberry DNA more visible to the naked eye.

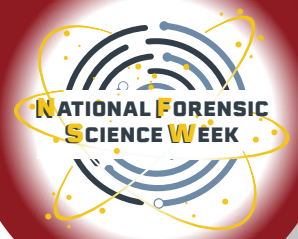
Materials (per person):

- 2–3 fresh strawberries
- 1 resealable plastic bag
- 2 tsp liquid dish soap
- 1 tsp salt
- 2 tbsp of cold 70% isopropyl rubbing alcohol (you can find this in the first-aid section of a grocery store or pharmacy)
- ½ cup water
- 1 coffee filter or paper towel
- 1 coffee stirrer or toothpick
- 2 plastic cups



Step-by-Step Instructions

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Step 1:

Remove the green leaves from the strawberries then place the strawberries in a resealable plastic bag. After sealing the bag, squish the strawberries using your hands for approximately 2 minutes, or until the strawberries are thoroughly mashed.

Step 2:

Next, make the DNA extraction solution by combining the following ingredients in a plastic cup.

- 2 tsp liquid dish soap
- 1 tsp salt
- ½ cup of water



Step 3:

Mix the DNA extraction solution gently using a coffee stirrer or toothpick, then add the solution into the plastic bag of mashed strawberries.

Step 4:

Seal the bag and gently mix the contents for approximately 1 minute by carefully squeezing and squishing the bag.



Step 5:

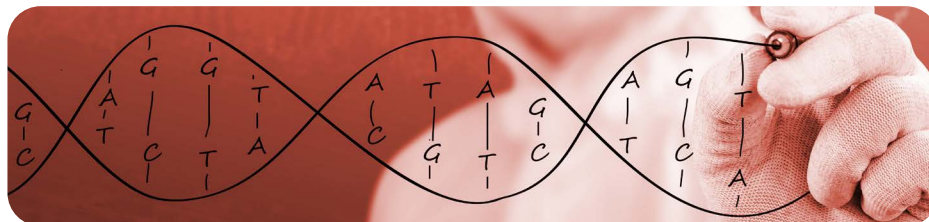
Place a coffee filter or paper towel over the opening of the second plastic cup and pour the mashed strawberry liquid onto the coffee filter or paper towel. Allow the liquid to drip down through the filter into the plastic cup—this liquid contains the DNA!

Step 6:

Remove the coffee filter or paper towel and add 2 tbsp of cold 70% isopropyl rubbing alcohol to the cup. You should see a clear or slightly cloudy material form in the upper layer of liquid—that's the strawberry DNA!

Step 7:

Using the coffee stirrer or toothpick, gently pick up and examine the strawberry DNA from the top layer.



The Forensic Technology Center of Excellence (FTCOE), led by RTI International, is supported through a Cooperative Agreement from the National Institute of Justice (15PNIJ-21-GK-02192-MUMU), Office of Justice Programs, U.S. Department of Justice. Neither the U.S. Department of Justice nor any of its components operate, control, are responsible for, or necessarily endorse, this printed material.