

# DNA ISOLATION

## Materials

- 2 strawberries
- 2 resealable quart-sized plastic bags
- 2 tsp dish detergent
- 1 tsp salt
- ½ cup of water
- Coffee filter
- 2 plastic cups
- ½ cup of rubbing alcohol (keep chilled until use to help with coagulation)
- Coffee stirrer/pipette/inoculation loop

## DNA Isolation of a Strawberry

1. Pull any green leaves off of the strawberry and put them aside.
2. Put the strawberries into one of the quart-sized plastic bags. Seal the bag and gently smash the strawberries for about two minutes. This starts to break open the cells and release the DNA.
3. Mix together 2 teaspoons of detergent, 1 teaspoon of salt, and ½ cup of water in one plastic cup. This will be your DNA extraction liquid.
4. Pour the DNA extraction liquid into the bag with the strawberries. This will further break open the cells.
5. Reseal the bag and gently smash the strawberries for another minute. Avoid making too many soap bubbles.
6. Place the coffee filter inside the other plastic cup.
7. Open the bag of strawberry liquid and pour it into the plastic cup with the filter. Twist the coffee filter above the liquid and gently squeeze the remaining liquid into the cup.
8. Pour an amount of rubbing alcohol equal to the amount of strawberry liquid down the side of the cup. Do not mix or stir.
9. Watch for a white, cloudy substance (DNA) to develop as a layer on top of the liquid within a few seconds. You have just isolated the DNA from the rest of the material contained in the cells of the strawberry.
10. Tilt the cup and use a coffee stirrer to pick up the DNA from the top of the cup.
11. Place the DNA swab in the clean resealable plastic bag.

National Human Genome Research Institute. (n.d.). *Strawberry DNA extraction*. <https://www.genome.gov/about-genomics/teaching-tools/strawberry-dna-extraction>

## Analysis Questions

1. In this lab, you used dish soap to break open the strawberry cells. In a real crime scene, how might household chemicals or environmental factors (like dirt or rain) interfere with DNA collection?
2. You touched the strawberry and the equipment during this experiment. What steps must a forensic technician take at a crime scene to ensure their own DNA does not contaminate the evidence?
3. Strawberries are octoploid (meaning they have 8 copies of chromosomes), which creates a visible clump of DNA. Human cells are diploid (two copies). How does this difference affect a forensic scientist's ability to extract visible DNA from a tiny drop of blood?
4. If this strawberry DNA were crucial evidence in a criminal investigation, why would it be vital to document exactly who handled the tube, at what time, and where it was stored?