DNA ISOLATION

The Crime

Dr. Rivera arrived at the zoo's biology lab Monday morning and discovered that an incubated fertilized egg from a newly discovered species, nicknamed the "gremlin," was missing. Five zoo employees had access to the lab over the weekend: Maya Bacon, Noah Carpenter, Eli Gene, Priya Baker, and Jordan Parker. The five worked in different roles throughout the zoo but occasionally assisted with projects in the biology lab.

Near the empty incubator where the egg was stored, you and your fellow investigators found a partially eaten strawberry. Because cells left on the strawberry could contain DNA, you collect the strawberry and perform a DNA isolation. After the extraction, you send the sample to a laboratory for further analysis.

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 strawberries 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.
12. Box up the DNA evidence to send out for final testing.

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