

## 8th Grade Science Lab: Extracting DNA from a Strawberry

### Objective:

Students will learn how to extract DNA from strawberries using everyday materials and understand the basic structure and function of DNA.

### Materials Needed:

- Fresh strawberries (1 per group)
- Resealable plastic bags
- Dish soap
- Salt
- Water
- Coffee filter or cheesecloth
- Small clear cups or beakers
- Isopropyl alcohol (chilled in the freezer)
- Measuring spoons
- Measuring cups
- Stirring rod or toothpick

### Safety Precautions:

- Ensure students wear gloves and goggles.
- Handle isopropyl alcohol with care; use in a well-ventilated area.
- Follow all school safety protocols and policies.

### Procedure:

1. **Preparation:**
  - Chill the isopropyl alcohol in the freezer before the lab begins.
2. **Making the Extraction Solution:**
  - Mix 2 tablespoons of dish soap, 1/4 teaspoon of salt, and 1/2 cup of water in a small cup.
3. **Mashing the Strawberry:**
  - Place one strawberry in a resealable plastic bag.
  - Remove as much air as possible, seal the bag, and gently mash the strawberry until it becomes a smooth pulp.
4. **Adding the Extraction Solution:**
  - Add 2 tablespoons of the extraction solution to the bag.
  - Reseal the bag and gently mix the contents for about one minute.
5. **Filtering the Mixture:**

- Place a coffee filter or cheesecloth over a clear cup or beaker.
  - Pour the strawberry mixture into the filter, allowing the liquid to pass through into the cup.
6. **DNA Precipitation:**
- Slowly pour an equal amount of chilled isopropyl alcohol into the cup with the filtered strawberry liquid.
  - Observe the formation of a white, cloudy substance (DNA) at the interface.
7. **Collecting the DNA:**
- Use a stirring rod or toothpick to gently spool the DNA from the solution.

**Reflection Questions:**

1. What did you observe when the alcohol was added to the strawberry mixture?
2. Why do you think the DNA became visible when the alcohol was added?
3. How does the extraction of DNA from a strawberry help us understand genetics?

**Assessment:**

- Write a short paragraph explaining the steps of DNA extraction and the role of each ingredient used.
- Draw and label a diagram of the DNA extraction process.

**Learning Standards Addressed:**

- **MS-LS3-1:** Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.
- **MS-LS3-1:** Analyze and interpret data on the variation and distribution of traits in a population.

**Teacher Notes:**

- Review all safety procedures with students before starting the lab.
- Ensure students understand the function of each component in the extraction solution.
- Encourage students to ask questions and think critically about the process.