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**Strawberry / Banana DNA Extraction Lab**

**NCSCOS GOAL: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**PURPOSE:** To extract and observe DNA from the cells of an organism

**Background information:** DNA stores the information for the functioning of the chemistry of life. The DNA found in strawberry and banana cells can be extracted using common, everyday materials. We will use an extraction buffer containing salt to neutralize the charged nucleic acids, and soap to dissolve the lipid (fat) part of the fruit and nuclear membrane. This extraction buffer will give you access to the DNA inside the cells. Scientists at Iowa State University estimate that we eat an average of 50 million cells in a single meal. If the average plant cell has 10 feet of DNA, that means we eat almost 100,000 MILES of DNA in one meal!!

There are three basic steps in DNA extraction. The cell must be lysed, broken, to release the nucleus. The nucleus must also be opened to release the DNA. At this point, the DNA must be protected from the enzymes that will degrade it, causing shearing. Once the DNA is released, it must be precipitated.

**Safety Precautions:** Do not eat or drink in the laboratory. Wash out test tubes and throw away your baggie when done.

**Materials:**  Each student group:

* Test tube rack
* Funnel
* Extraction buffer
* Ziploc bag
* 1 strawberry/ banana chunk
* Cheesecloth
* Test tube
* Stirring rod
* Graduated Cylinder

**Procedure:**

**\*\*Two things to keep in mind: 1) everything needs to stay cold and 2) Do not touch the inside of the test tubes.**

1. Place one strawberry in a Ziploc bag.
2. Smash strawberry with fist for 2 minutes.
3. Add 10 mL of extraction buffer to the bag.
4. Mush again for one minute.
5. Filter through cheesecloth into the test tube using the funnel so that it is 1/8 full. (about the length of the last digit of your thumb)
6. **Come get an ice cold test tube of ethanol from the front of the class. Tilt your test tube and Slowly** pour the ice-cold ethanol until the tube is half full.
7. You will see the DNA precipitate out of solution and float to the top. You may spool the DNA on your coffee stirrer.

## **Results and Questions**

1. Describe what the isolated DNA looks like.
2. What protects the DNA in a living cell?
3. What surrounds a plant cell and provides protection?
4. What two steps were used to open the cell? A. B.
5. What causes the DNA to precipitate?
6. Do you think the DNA would look different if it came from a different source?

 If yes, why and what might it look like?

If no, why not?

**DRAW, COLOR, Label your DNA in the TEST TUBE.**

**Conclusion:** Write a summary paragraph about the structure of DNA. Use key vocabulary words and underline them. You must use 5 words and write at least 5 sentences for full credit.