** Extracting DNA from Fruit**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_

Pre-Lab Questions:

1. What is the main function of DNA?
2. What do you think the DNA will look like?
3. What is the purpose of smashing the fruit?
4. REVIEW: What is a buffer?
5. What is the purpose of the salt in the buffer solution?
6. What is the purpose of the soap in the buffer solution?
7. What will the alcohol do to the DNA?
8. How much of the buffer solution will you add to the fruit solution?

Research:

The long, thick fibers of DNA store the information for the function of the chemistry of life. DNA is present in every cell of plants and animals. The DNA found in fruit cells can be extracted using common, everyday materials. An extraction buffer contain salt will be used to break up protein chains that bind around the nucleic acid. Dish soap will also be added to the extraction buffer and will help to dissolve the lipid (fat) part of the fruit cell wall and nuclear membrane. This extraction buffer will help provide access to the DNA. Alcohol will help unravel or unwind the DNA.

Materials:

Zip lock baggie with frozen strawberry Test Tube

10 mL DNA extraction buffer(soapy water) Beaker

Graduated cylinder Stirring rod

Ice Cold 91%ethanol(rubbing alcohol) Coffee filter

Procedure:

1. Smash the strawberry in the baggie for 2 minutes.
2. Add 10 mL of DNA extraction buffer(soapy water)
3. Smash again for 1 minute.
4. Pour the mixture into the coffee filter over the beaker and squeeze the solution into the beaker.\*\*Make sure JUST liquid goes in the beaker!!\*\*
5. Pour 5 mL of the solution from the beaker into the test tube.
6. SLOWLY pour the ice cold ethanol into the test tube until the test tube is half full with liquid.
7. Dip the stirring rod into the test tube right where the alcohol and

extract layers are in contact with each other. Spin the rod to wrap

the DNA around it.

\*\*See picture\*\*

1. Throw all DNA mixture, fruit mixtures, paper towel and Ziploc bag

into the trash. Rinse out the test tube, funnel, graduated cylinder,

and any other lab equipment used. Put all lab equipment away as

directed by the teacher.

1. Repeat steps 1-8 with another type of fruit.

 Data:

Watch where the alcohol and extract layers come in contact with each other. Keep the tube at eye level so you can see what is happening.

What do you see appearing? (Sketch what you see in the box and note any other observations.)

Notes:

Analysis and Conclusion:

1. Match the step in the procedure to the function it completed. (write down in your notebook all of the steps and answers)

PROCEDURE FUNCTION

|  |  |
| --- | --- |
| * 1. Initial smashing and grinding of fruit
	2. Mush fruit with salty soap solution
	3. Filter fruit slurry through cheese cloth
	4. Addition of alcohol to filtered extract
 | \_\_\_\_\_ unwind DNA and precipitate DNA in solution. \_\_\_\_\_ Separate cells from other cells and expose the most cells possible to the chemicals\_\_\_\_\_ Break open the cell wall, nuclear membrane, and dissolve the protein chains around the nucleic acids. \_\_\_\_\_\_ Separate components to allow for easier location of the DNA and remove unwanted/unbroken chunks of fruit.  |

COMPLETE SENTENCES:

1. Relate what you know about the chemical structure of DNA to what you observed today. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Is DNA the same in every cell of your body? Explain.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Knowing that DNA is not soluble in alcohol and is soluble in water. Explain why you think it is important that we used alcohol and not water in the final step of the DNA extraction.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. A person cannot see a single cotton thread 100 feet away, but if you wound thousands of threads together into a rope, it would be visible much further away. Is this statement analogous to our DNA extraction? Explain.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Why is it important for scientist to be able to remove DNA from an organism? List two reasons.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. What were the differences in the DNA you extracted from strawberry compared with the banana? Is there more or less DNA? Why do you think there is a difference?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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