Section: ____

Names: ___

Chem 227

Strawberry DNA Extraction / Data and Report Form

Procedure: (Work with a partner.)

- 1. Obtain one fresh strawberry and remove the green sepals (tops) from the berry.
- 2. Place the strawberry in a re-sealable plastic bag.
- 3. Close the bag slowly, pushing all the air out of the bag as you seal it.
- 4. Being careful not to break the bag, thoroughly mash the strawberry with your hands for two minutes.
- 5. Pour 10 mL of extraction buffer into the bag with the mashed strawberry. Reseal the bag.
- 6. Mash the strawberry for one additional minute.
- 7. Place a funnel into a 50 mL centrifuge tube. Place the cheesecloth in the funnel to create a filter. The cheesecloth may overlap the edge of the funnel.
- 8. Pour the strawberry mixture into the funnel, filtering the contents through the cheesecloth and into the 50 mL centrifuge tube.
- 9. Carefully pour 2 mL of the filtered contents from the 50 mL centrifuge tube into a clean 15 mL tube. Use the lines on the side of the 15 mL tube to help measure the amount added.
- 10. Hold the 15 mL tube at an angle. Using a plastic dropper carefully add 5 mL of cold ethanol by running it down the inside of the tube. Add the ethanol until the total volume is 7 mL (use the lines on the side of the tube to measure). You should have two distinct layers. CAUTION: Do NOT mix the strawberry extract and the ethanol!
- 11. Watch closely as translucent strands of DNA begin to clump together where the ethanol layer meets the strawberry extract layer. You may see tiny bubbles in the ethanol layer appear where the DNA precipitates.
- 12. Slowly and carefully rotate the wooden stick in the ethanol directly above the extract layer to wind (or "spool") the DNA. Remove the wooden stick from the tube and observe the DNA.
- 13. Rinse and return all plastic containers. All solutions can be disposed of down the drain.

Questions:

1. Describe the physical appearance of the DNA that you have extracted. Is it a single molecule comprised of a very long double helix? Briefly explain.

2. What does macerating the strawberries, and treating them with the extraction buffer do to the strawberry cells? Why is this essential? Briefly explain.

- 3. DNA is not soluble in ethanol, but it does dissolve in water. Briefly explain your reasoning for this seemingly anomalous difference since both are polar, protic solvents.
- 4. Will DNA from animal cells have the same physical appearance as DNA extracted from plant cells? Briefly explain your reasoning.

Modeling: (Work with another partnership in a group of four.)

- Obtain a puzzle set. Your group will make a nucleotide model for a DNA segment from the puzzle pieces respectively using a phosphate unit, a deoxyribose sugar unit, and an appropriate base.
 - 5. Match the following:



Take a phosphate unit, a deoxyribose sugar unit, and an appropriate base unit and attach the pieces to look like this:



Use this as the appropriate nucleotide in the DNA sequence below from the *sense* strand and connect the remaining nucleotides to complete the DNA segment.

TGCACC

6. Clearly illustrate below how replication makes this same DNA segment showing the specific RNA intermediates. Include labels.

T G C A C C

Reading the base sequence, TGCACC, from left to right is which direction in relation to the deoxyribose saccharide-phosphate direction, 3' to 5' or 5' to 3'? Briefly explain why this is important in relation to your illustration.

Before taking the pieces apart, show Dr. R. the segment for approval and signature.