Who Committed the Dastardly Density Deed?

Names _____

_____

THE CRIME

Three bungling would-be burglars named Agar, Bubba, and Curly decided to relieve a wealthy socialite, Mrs. Moneyball, of her most valuable possession, a diamond necklace. After a brief stakeout, the trio entered her home while she was out. Unknowingly, of course, they tripped a silent alarm upon entry. The three located and unlocked the safe, from which they carefully removed a tall, clear canister containing three layers of colorless liquid.

Peering downward into the vessel, they saw the exquisite necklace sparkling on the bottom. The leader of the trio designated one of the others to reach down and snatch the necklace from its liquid bondage. The burglar, trembling with fear, managed to reach only into the first level of liquid before rapidly retracting his hand. Furious, the leader screamed for the second burglar to grab the priceless prize. The second would-be thief, shaking like a leaf, reached down as far as the second liquid layer before hastily pulling back his hand. The boldest burglar, giving up on his two timid cohorts, plunged his hand down to the bottom of the container and triumphantly withdrew the necklace.

At this instant, they heard the distant wail of a siren and stampeded from the house. As they were racing across the front lawn, a patrol car rounded the corner, freezing Agar, Bubba, and Curly in their tracks. As the officer approached, they raised their hands in the air and surrendered. The diamond necklace was also recovered on the lawn where one of the thieves had dropped it. It is now up to the police to determine which thief had actually snatched the necklace from the bottom of the canister.

At the station, the three were required to hold their hands under a special light that caused the liquids found in the container to glow different colors. Agar's hand was coated in a liquid that glowed red. Bubba's hand glowed blue, and Curly's hand glowed yellow. Fortunately, any liquid picked up in a higher layer of the canister was washed off in the next deeper layer, so the crime lab scientists were certain they could determine who reached into the bottom of the canister.

The crime lab separated the liquids from Mrs. Moneyball's canister and added dye to indicate the color that glowed under the light, but carelessly forgot to record the order in which the liquids were layered. Your job is to re-layer the liquids in the canister in the proper sequence to determine which thief stuck his hand all the way to the bottom to retrieve the necklace. That person will be charged with first-degree burglary while the remaining two will only be charged as primary and secondary accomplices. Submit your evidence to the District Attorney, who will charge the criminals according to their degree of dastardliness.

OBJECTIVE

To determine which burlar--Agar, Bubba, or Curly--reached into the bottom of a canister to steal Mrs. Moneyball's diamond necklace. You will do this by combining three different colored liquids in the proper sequence so that no mixing occurs.

MATERIALS

- 1 test tube rack
- 4 test tubes
- pipette

PROCEDURE

1.) Using a test tube rack, place 4 clean test tubes in the upright position.

2.) When your teacher calls you over, bring your rack with the test tubes. You will receive 5 mL of 3 different liquids. Return to your lab station.

3.) Carefully and **SLOWLY**, use your pipette to add 1.5 mL of each of these liquids, one at a time, to the fourth test tube. Drizzle the liquids down the inside wall of the test tube to facilitate layering.

4.) Examine that fourth test tube to see if the liquids formed three distinct layers. If not, clean out the mixture and repeat step 3, but add the colored liquids in a different order. Continue experimenting with the liquids until they remain in distinct layers in the test tube.

5.) When you determine the correct layering sequence, deduce which of the burglars should be charged with the most serious crime using the data chart.

DATA

Complete the data table below. Make sure you include a picture of your final results.

Burglar	Layer Reached
Agar	
Bubba	
Curly	

CONCLUSION

1.) In paragraph form, list the correct sequence of liquids, beginning with the top layer. Include which burglar reached into each layer and what their charge should be. Make sure to include in your paragraph the answers to these questions: Why the liquids when in their places in relation to one another? What if you turn the test tube upside down?