

■ Introduction

The **scientific method** is something that we use very often without being aware of it. This **method** is a way of approaching problems in an organized way. Below are the basic steps of the scientific method.

- 1) Make **Observations**-Information obtained by one or more of our senses.
- 2) Formulate a **Hypothesis**-An educated guess about the observations.
- 3) Perform an **Experiment**-A procedure designed to test the hypothesis.
- 4) Analyze **Data** – collect, record and analyze quantitative (numerical) and qualitative (descriptive) data.
- 5) Draw a **Conclusion**-Analysis of the experiment and discussion about whether or not the results support the original hypothesis.
- 6) **Repeat**, Repeat, Repeat - Replicate your work to ensure the validity of your results

■ Background

Today we will be conducting an experiment and making detailed observations. We will use the steps of the scientific method to guide our work. In this investigation we will be testing different qualities of milk to see their reaction when food coloring and dish soap are added. We will observe and record the different reactions of the different milk types.

■ Materials

- | | | |
|---------------|------------|-------------|
| petri dishes | whole milk | eye dropper |
| food coloring | 2% milk | |
| dish soap | 1% milk | |

■ Scientific Method

1. Preliminary Observations

a) Name one thing milk, food coloring, and dish soap have in common. _____

b) Define density. _____

c) Rank the following [1 = lowest density; 5 = highest density]

___ 1% milk ___ dish soap ___ whole milk ___ food coloring ___ 2% milk

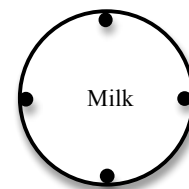
d) What is the relationship between dish soap and fat? _____

2. Make a Prediction

After thoroughly reviewing the materials and procedures, in a single complete sentence predict the outcome of this experiment.

3. Procedures (work in your lab/table groups)

1. Match the milk samples with the appropriately labeled Petri dish. Into each Petri dish pour enough of the respective milk such that the milk completely covers the entire bottom surface of the dish.
2. Per the diagram dispense **FOUR (AND ONLY FOUR)** drops of food coloring into the **Whole Milk** Petri dish on the outside edge of the milk (touching the walls of the dish).
**color does not matter*
3. After one minute, record detailed observations in the data table.
4. Place one drop of dish soap in the center of the milk layer.
5. After one minute, record detailed observations in the data table.
6. Repeat steps 2 thru 5 for the 2% milk; followed by the 1% milk
7. Clean-Up: *Discard the entire contents of each dish into a sink; rinse and dry each dish. Leave materials in the same condition as you found them.*



■ Data Table

Type of Milk	Observations After Food Coloring is Added	Observations After Soap is Added
Whole Milk		
2%		
1%		

4. Analysis and Conclusion

- a) Based on your recorded observations make a general statement about the way food color behaves in the different types of milk.
- b) Based on your recorded observations make a general statement about the way food color behaves in the different types of milk *after the soap is added*.
- c) Based on what you observed what would you expect to happen if you tested heavy cream? Explain.
- d) Identify and describe the particular scientific process, or processes, that are responsible for your observations.