

## SCIENCE

Science is not just a topic or subject in school. It is a method that has been helping us learn about the world around us for thousands of years. To be successful in science, it is important to take part in the process. Let's practice.

Expectation - ENGAGE: *Try to learn, think and do as much as you can as often as you can. Science is all about asking questions and trying to figure out the answers. Everyone has a bad day once in awhile, but you should be trying to engage on a regular basis.*

### **LAB: Color Mixing**

#### Materials

- 2 beakers
- cold water in one of the beakers
- hot water in one of the beakers
- food coloring - 2 different colors
- paper towels for spills and clean-up

Expectation - Group Work: *be a positive and productive member of your group and the class. We want to create a classroom environment where you feel like you can take part and learn during the activities. It's better when everyone is included, engaged and learning.*

#### LAB Procedure

1. Send one student to the refrigerator to get a beaker of cold water.
2. Wait for the teacher to come around and fill the hot water beaker.
3. Place both beakers of water next to each other on the table. Let them sit still for a minute before adding the color.
4. As quickly as possible, place one drop of each color in the cold water, then one drop of each color in the warm water. If you do more than a drop or two, you have to start over.

Expectation - Observe: *when we are observing, we are focusing on what we can sense, not what we think or even know about it.*

5. Allow the colors to mix and observe the difference between the two beakers.
6. Sketch and describe your observations on the next page. Observe for 3 minutes or so. Answer question #2 also.

Expectation - Be responsible: *keep your seat and table area tidy and try to clean up as much and as well as you can. I will try to always have the clean-up procedures clearly stated.*

7. Clean-up - rinse out the beakers well and place upside down on a piece of paper towel on the table.



### Observations

1. Sketch what you see in the beakers.
2. Compare and contrast the action of the food coloring in each of the beakers.

Expectation - Ask questions about your observations: *Asking why is the central idea in science. More than likely, answers are going to lead to more questions.*

3. Ask some questions about what you observed in the lab. These can be things you might know or have no idea about.

Expectation - Infer what you think is happening: *an inference is an explanation for something that we come up with combining our observations and background knowledge. Be careful because our inferences are often wrong.*

4. Inference - Why do you think water temperature has an effect on the rate of mixing in the beakers?

Expectation - Be OK being wrong: *throughout the history of science, there are many examples of even scientists being completely wrong. Remember Alfred Wegener? He was laughed at by many top scientists who thought it was impossible that the continents moved around the surface of the earth. Turns out Wegener was right.*

Expectation - Make connections beyond the lab: *try to connect what you already know to what we are learning. This is a big part of working at the highly proficient level.*

**5.** What part does **energy** play in this experiment?

Expectation - Be OK not knowing something: *we all have different levels of knowledge and skills in science. If you know something already, great! If not, no problem. That's why we are here.*

Complete the activities below.

**6.** There were several **variables** in this experiment.

1. Look at the list below.
2. Which ones did we follow and not follow?
3. Choose one of the variables below
4. Explain why is important to keep the variable the same
  - a. the amount of water in each beaker
  - b. the size of the beaker used
  - c. the amount of food coloring
  - d. when the coloring was added to the water

**7. Fill in the blanks with increases or decreases.**

Heating a substance \_\_\_\_\_ molecular motion.

Cooling a substance \_\_\_\_\_ molecular motion.

As molecular motion increases, the space between molecules \_\_\_\_\_.

As molecular motion decreases, the space between molecules \_\_\_\_\_.

As energy \_\_\_\_\_, the molecules slow down.

As energy \_\_\_\_\_, the molecules speed up.