

Scientific Inquiry 1.3 (7th)

Date _____

Last _____, First _____ per _____

Introduction:

Lately we've had hot weather. I've **observed** more flies when I sit in my back yard. I have a **question**. *Do more flies hatch when the temperature goes up?* I think it is possible so I form a **hypothesis**.

The rate at which flies hatch increases as the temperature increases.

I design an **experiment**.

I catch 100 fly maggots and divide them into 5 groups of 20. I place each group in 5 jars with exactly the same conditions; same food, same jar size, same moisture, exposure to the same amount of light, and each with the same amount of air. The one **variable** that is different in each of the jars is temperature. I keep the 5th jar at the same temperature as the 1st jar. That way if I get different results in jars 1 and 5, then there could be a different variable affecting the rate at which flies hatch that I haven't thought about. I'll call my first jar my **control group**. The temperature of jar 1 will be kept at 30°C, Jar 2:15°C, Jar 3: 20°C, jar 4: 25°C, and jar 5: 30°C

1. What is **scientific inquiry**? _____

2. Scientific Methods

The scientific process involves a series of steps also known as the **scientific method**. These steps are listed below. Write in the missing steps.

- a. Make observations
- b. _____
- c. _____
- d. Test a hypothesis
- e. _____
- f. Draw conclusions
- g. _____

3. Observations Lead to Questions

Write down one question concerning each of the following observations. Avoid starting your question with the word "why", instead think of a factor that might explain your observation and include that factor or possible reason in your question.

Observation 1: The sky is blue.

Question _____

Observation 2 : I notice more flies on hot days.

Teacher's Question _____

4. **Forming a Hypothesis**

What is a hypothesis? and for a hypothesis to be a good, what characteristic must it have?

- a. A hypothesis is _____
- b. A good hypothesis must be _____
- c. The teacher's hypothesis about flies was: _____

5. **Testing a Hypothesis with an Experiment**

Why are experiments designed in science? _____

6. **Variables**

What are variables? What were some of the variables in my experiment with flies?

- a. Variables are _____
- b. Variables in the fly experiment
 - a. _____
 - b. _____
 - c. _____

7. **Controlled Experiments**

In a controlled experiment, how many variables should be manipulated at a time?

- a. # of variables that should be manipulated. _____
- b. What kind of variable does the experimenter change? _____
- c. If the changed variable causes a change in the result, then what kind of variable is the result? _____

If changing the temperature of fly maggots in a jar changes the rate at which they hatch then;

- d. What is the manipulated variable? _____
- e. What is the responding variable? _____

8. **Data**

What is data? Complete the sentences.

- a. Data is information you _____
- b. What is the type of data I need to collect in my fly experiment? _____

I run my experiment with fly maggots. My plan is to count the number of flies that hatch each day. I construct a table to record my data. On day 1 I count 10 flies in the 1st jar, 2 flies in the 2nd, 4 flies in the 3rd, 6 flies in the 4th, and 10 flies in the 5th. On day 2 I count 10 more flies in the 1st jar, 2 more in the 2nd, 5 more in the 3rd, 7 more in the 4th, and 10 more in the 5th jar. On the third day I count 0 more in the 1st jar. (All 20 maggots had hatched in the first two days). I count 3 more flies in the 2nd jar, 5 more flies in the 3rd, 7 more flies in the 4th, and 0 flies in the 5th. (All 20 maggots had hatched in the first two days in jars 1 and 5)

Add labels to the table. Fill in the data.

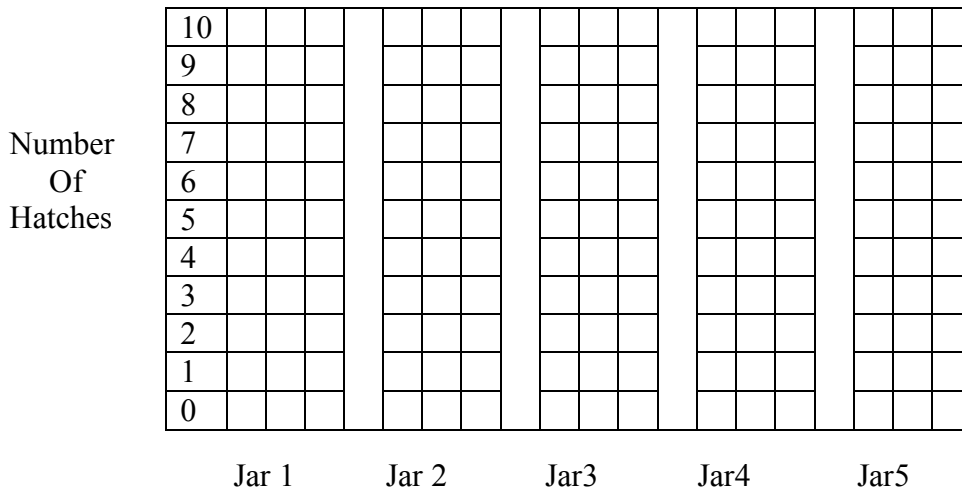
Temperature vs. # of Flies hatched per day

JAR #					
TEMPERATURE					
Hatches Day1					
Hatches Day 2					
Hatches Day 3					
TOTAL # of Flies					

10. Analysis

- a. Analyze the data above. Make a bar graph to help visualize what happened in the experiment. Use colored pencils. Use 3 columns for each jar. One column for day 1 another for day 2 and a third for day 3.

Day: 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3



11. Write a conclusion. Does the data support my hypothesis? If not what are some possible explanations. How sure are you?

12. What are some ways you could communicate the results of this experiment?