SCIENTIFIC METHOD

Name _____

Put the following steps of the scientific method in the proper order.

2 Research the problem.

5 Observe and record.

3 Make a hypothesis.

1 Identify the problem.

6 Arrive at a conclusion.

4 Test the hypothesis.

Match the following terms with the correct definition.

b 1. hypothesis

f 2. control

g 3. variable

a 4. experiment

d 5. conclusion

e 6. theory

c 7. data

a) organized process used to test a hypothesis

b) an educated guess about the solution to a problem

c) observations and measurements recorded during an experiment

d) a judgment based on the results of an experiment

e) a logical explanation for events that occur in nature

f) used to show that the result of an experiment is really due to the condition being tested

g) factor that changes in an experiment

Name _____ Date _____

The Scientific Method

Scientists study problems and conduct experiments in a variety of ways. However, all use the scientific method. The **scientific method** is an organized way to find answers to a problem. Match each phrase in the word box to an activity that describes it. Then number the descriptions to show the correct sequence for the scientific method.

interpret data	observe and record	make a hypothesis
identify the problem	arrive at a conclusion	test the hypothesis

A Make a Hypothesis

A group of students discusses what they believe will be the outcome of an experiment they are about to conduct. Each student records a statement that will either be proven or disproven by the experiment.

2

B Observe & Record

Each member of the group carefully watches as the experiment proceeds. One group member writes down the comments of the group as they call out what they see.

4

C Interpret Data

After the experiment is complete, the group discusses their observations. They review their notes and create a graph that shows the results of the experiment. The group discusses what these findings might mean.

5

D Test the Hypothesis

Now that the group has decided on a hypothesis, they are ready to proceed with the experiment. As they work, the group is cautious to test only one variable at a time and to follow all directions carefully.

3

E Arrive at a Conclusion

The group reviews their notes and the data they have collected. After a short discussion, they decide whether or not the original hypothesis is correct.

6

F Identify the Problem

A science group begins a discussion related to what they have been studying in class. They take turns posing questions they still have about the topic. Together, they decide on an experiment they would like to conduct. They hope the experiment will answer some of the questions they still have.

1

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Scientific Definitions

The scientific method uses specific vocabulary related to each step in the process. Match each term in the word box to its definition.

hypothesis	control	variable
experiment	procedure	theory
data	conclusion	

1. experiment — This is the organized process used to test a hypothesis.
2. hypothesis — This is an educated guess about the solution to a problem.
3. data — This refers to the observations and measurements recorded during an experiment.
4. variable — This is a factor that changes in an experiment. Proper procedure calls for testing only one of these at a time.
5. theory — This is a set of statements or ideas that explain a group of facts or phenomena.
6. conclusion — This is the judgment based on the results of an experiment.
7. control — This is a variable that is kept constant in an experiment.
8. procedure — This refers to the series of steps taken in order to carry out an experiment.

Name _____ Date _____

Laboratory Safety

When conducting experiments, it is important to handle equipment correctly and follow procedures that keep students and equipment safe. Each of the following scenarios illustrates a safety rule that should be observed in a science laboratory. Match each phrase in the word box to the situation that describes it.

wear proper safety equipment	handle glass and sharp materials carefully
keep workspace clean and organized	secure loose clothing and hair
use scientific smelling when needed	keep papers and other flammables away from flame

1. Secure loose clothing & hair Tomas and Elizabeth prepare to begin today's experiment. Tomas rolls up his sleeves so they will not be in the way. He remembers how distracting it is to be pushing them up all the time. Elizabeth secures her long hair with a hair band, ensuring that her hair will be out of her face and away from the lab materials.

2. Keep flammables away from flame Today Lewis will be working with a Bunsen burner to heat materials in a test tube. Before he begins, Lewis clears away all the papers that covered his workspace. He also removes his sweater from his chair back and moves it to a coat hook on the far wall.

3. Use scientific smelling when needed Alicia collects sensory data from her experiment. She writes down what she sees and hears. She notes that the substances also produced heat. Alicia is careful to hold the beaker away from her face and fans the air toward her nose as she sniffs carefully. She notices a faint smell like rotten eggs. She is thankful she did not take a big sniff.

4. Handle glass & sharp materials carefully Robert carries the beaker full of water with both hands, just to be safe. He would not want to clean up the mess or risk being cut if he were to accidentally drop it.

5. Keep workspace clean & organized The students mop up spills and properly dispose of used materials as they work. In this way they will not contaminate the results of their experiments.

6. Wear proper safety equipment Patricia ties on a long apron and dons a pair of plastic safety glasses. The apron keeps materials from staining her clothes. The safety glasses protect her eyes from any flying substances or splashing liquids