Name	Data	Conting
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Exploring the Scientific Method

The **scientific method** is a process that scientists use to better understand the world around them. It includes making observations and asking a question, forming a hypothesis, designing an experiment, collecting and analyzing data, and drawing a conclusion. This is sometimes also referred to as scientific inquiry. A **hypothesis** is a possible explanation for an observation. A good scientist will design a **controlled experiment** to test their hypothesis.

In a controlled experiment, only one variable is tested at a time. It is called the

manipulated or independent variable. The experimental group will test the independent variable. The control group will be left alone, so you have something to compare your results to. The variable that determines the data is the responding, or dependent variable. It responds to the manipulated variable. All other variables in the experiment should remain the same, because if you change more than one variable, you will not know which variable explained your results. Once something has been tested many different times by many different scientists, it can become a scientific theory. It is different from a scientific law, which

describes what will happen every time under a particular set of conditions.

True or False

If the answer is true, write "true" on the line. If the answer is false, replace the underlined word or phrase with one that will make the sentence correct. Write the new word(s) on the line.

1.		Forming a hypothesis is the first step of	of the scientific method.
2	describes something in r	A scientific law is different from a <u>scie</u> ature without attempting to explain it.	entific theory because it
3.	carry out investigations	In order for a <u>hypothesis</u> to be testal that will either support or disprove it.	ole, scientists need to be able
1 .	experiment. thing as the independent	The <u>experimental group</u> is the group to The <u>manipulated variable</u> is the same variable.	hat is left alone during the

Matching

Match the word to the definition. Write the letter on the line.

6.	Scientific inquiry	A.	This group shows the effect of the variable being tested
7.	Hypothesis	B.	This is the one variable that is changed
8	Control group	C.	A well-tested explanation for experimental results
9	Experimental group	D.	The many ways in which scientists study the natural world
10	Independent variable	E.	A possible answer to a scientific question
11.	Dependent variable	F.	This describes an observed pattern in nature
12	Scientific theory	G.	This group is left alone and not experimented on

12 ____ Scientific theory G. This group is left alone and not experiing 13. ____ Scientific law H. This is the variable that gets measured



Read through the following scenarios. Identify the control group, the experimental group, the independent variable, and the dependent variable.

Scenerio	Independent Variable	Dependent Variable	Experimental Group	Control Group
A company wants to test a new dog food that is supposed to help overweight dogs lose weight. 50 dogs are chosen to get the new food, and 50 more continue their normal diets. After one month, the dogs are checked to see if they lost any weight.	<u>14</u> .	15.	16.	17.
A new sunscreen has been developed that is supposed to be more effective at preventing sunburn. 30 participants spray one arm with the new formula, and spray the other arm with the leading formula. After 4 hours in the sun, their skin is evaluated for any redness.	18.	19.	20.	21
A student wants to study the effect of sunlight on plant growth. In his experiment, 12 plants receive normal amounts of sunlight, but half of them are kept under bright sun lamps all night long. After 6 weeks, the plants' heights are measured.	22.	23.	24.	25.