



**control:** a test group in which the variable is not altered. The control helps scientists see what difference, if any, that a change in the variable makes.

## Mars Rover Model Celebration – Lesson Plan

### Introduction:

**TEACHER: Please teach the vocabulary card for variable before introducing this card. The word variable is frequently used on this card to teach control and should be taught first.**

One of the new vocabulary words for this unit is “control”. Control is a word that has several meanings but today we are going to talk about a specific definition that is used in scientific experiments. A control in an experiment is “a test group in which the variable is not altered. The control helps scientists see what difference, if any, that a change in the variable makes.”

Let’s look at some pictures that will help us understand this particular meaning of control. A scientist decided to find out the effect that different amounts of fertilizer might have on how quickly a plant grows. He placed four plants in identical pots, with identical soil and placed them in the same window of his lab. He gave them the same amount of water each day. The only difference was the amount of fertilizer he used in each pot. The plant on the left is the control. No fertilizer was added. The other three plants were experimental, with each receiving a different amount of fertilizer. The scientist then compared the plants receiving the fertilizer to the control to see if there was a difference in growth. *(Discuss the differences in the plant growth with your students.)*

### Example:

In science, it is very important to use a control in experiments. You can compare the control to your experiment to see if the variable you changed made any difference. Think back to my experiment to change the orbit of one rock in Saturn’s rings. Can anyone tell me what the control would be in my experiment? *(Allow students to answer.)* Yes, that’s right. Any one of the billions of rocks I didn’t move and that are similar in size and shape to the rock I move can serve as our control.

### Reflection:

I am going to read some experiments. When you can identify the control, I want you to raise your hand. When I call on you, I want you to say, “I think the CONTROL is...”

- A student lets dry different amounts of glue on one side of a coin so that it weighs more. Another coin has no added glue. Then he flips each of the coins 100 times to see if the coins flip differently or the same. (Control= coin with no glue)
- Students want to find out whether a garbage can will cut down on trash left on a playground. For a week, the students keep track of the amount of trash left on the playground. Then they place a garbage can on the playground and again record the amount of trash left on the playground. (Control=trash from the week with no trash can)
- A student wants to know whether people think chicken tastes better with salt. She serves people three pieces of chicken. One has no salt, one has one shake of a saltshaker and the last piece has 10 shakes. (Control: the chicken with no salt)

### Make it personal:

## **Mars Rover Model Celebration – Lesson Plan**

Think about your Mars Rover project. Does your mission have an experiment? If so, have you included a control in your experiment? If you don't have a control, how can you include one? Share your thinking with your neighbor. Be sure to use the word "control" in your sharing. Then I will ask some of you to tell the class about how you included a control in your experiment.