

VARIABLES READING

We talk about variables a lot in science because understanding variables is the key to being able to do a good science experiment that gives you definite results. A **variable** is any part in a system that can be changed. In simpler terms, it's anything that can be changed in an experiment. Some variables that might affect the speed of a snowboarder include wax, skill level, clothing, tuning of the board, snow conditions, course, etc. The key to having a good experiment is only changing one variable in an experiment and keeping the others the same. Let's take a closer look at this. Circle the word reading at the top of this page.

There are 3 types of variables.

They are independent variable, dependent variables, and controlled variables.

- The **independent variable** is the one that you change on purpose. The important thing to note is that you should have only ONE independent variable.
- Another variable is the **dependent variable**. The dependent variable is the variable that might be affected by the independent variable. In other words, the dependent variable **DEPENDS** on the variable you changed on purpose. The dependent variable is usually the one that you measure.
- The variables that don't change in your experiment are called **controlled variables** and you should have lots of these.

Lets look at an EXAMPLE.

A student wanted to test how the mass of a paper airplane affected the distance it would fly. Paper clips were added before each test flight. As each paper clip was added, the plane was tested to determine how far it would fly. The mass of the plane (# of paper clips added) was the independent variable because the student changed that on purpose. The dependent variable was the distance flown because it depends on the other variable. Some controlled variables would include wind speed, wind direction, how hard the plane was thrown, the design of the plane, and the distance above the ground the plane was thrown from.

Why can we only have ONE INDEPENDENT variable?

Well, basically if we change two variables, we won't know which one caused the results of the experiment. For example, if we changed the # of paper clips and the design of the plane we wouldn't know which caused it to fly further. The key to designing a good experiment is to only have one independent variable and hold all the other variables the same.

LAST

FIRST

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3

2

1

0/INC

Staple this to
BACK OF THE
ORIGINAL
HANDOUT

MASTERY:3 Kinds of Variables

DIRECTIONS: If you earned a MASTERY on the PRE-TEST, I would like you to make up 3 scenarios of possible experiments and then IDENTIFY the VARIABLES in your experiment. The format should be like the ones I have on the original handout. If you are having trouble, go back to the original handout and practice 1st. PLEASE UNDERLINE THE VARIABLES IN YOUR SCENARIO AND STATE ATLEAST ONE CONTROLL in the SCENARIO.

1. _____

INDEPENDENT VARIABLE	
DEPENDENT VARIABLE	
CONTROL VARIABLE	a) b) c)

2. _____

INDEPENDENT VARIABLE	
DEPENDENT VARIABLE	
CONTROL VARIABLE	a) b) c)

3. _____

INDEPENDENT VARIABLE	
DEPENDENT VARIABLE	
CONTROL VARIABLE	a) b) c)