2) **Dependent variables** are the things that the scientist focuses his or her observations on to see how they respond to the change made to the independent variable. Observe and measure

In our dog example, the dependent variable is how much the dogs eat. This is what we are observing and measuring. It is called the "dependent" variable because we are trying to figure out whether its value depends on the value of the independent variable. If there is a direct link between the two types of variables (independent and dependent) then you may be uncovering a cause and effect relationship. The number of dependent variables in an experiment varies, but there can be more than one.

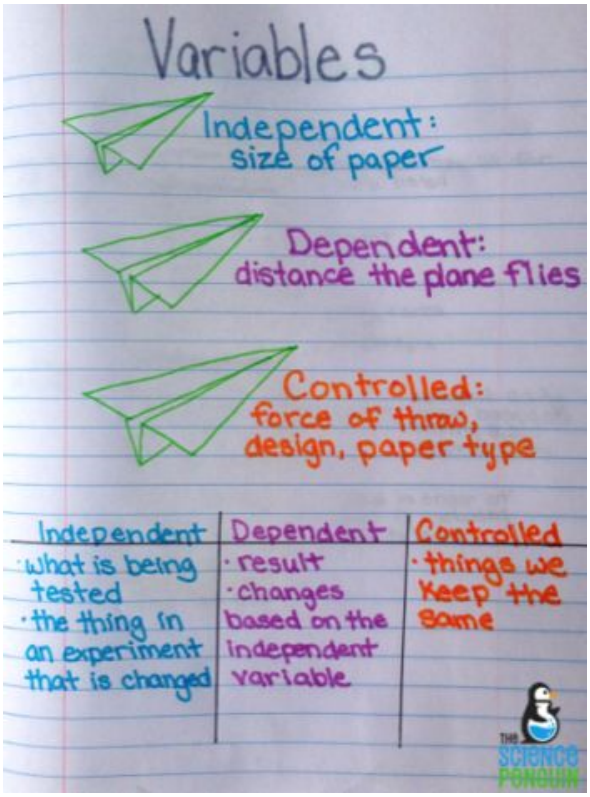
3) **Controlled variables** are quantities that a scientist wants to remain constant, and must observe them as carefully as the dependent variables.

For example, in the dog experiment example, you would need to control how hungry the dogs are at the start of the experiment, the type of food you are feeding them, and whether the food was a type that they liked. Why? If you did not, then other explanations could be given for differences you observe in how much they eat. For instance, maybe the little dog eats more because it is hungrier that day, maybe the big dog does not like the dog food offered, or maybe all dogs will eat more wet dog food than dry dog food. So, you should keep all the other variables the same (you control them) so that you can see only the effect of the one variable (the independent variable) that you are trying to test. Similar to our example, most experiments have more than one controlled variable. Some people refer to controlled variables as "constant variables."

In the best experiments, the scientist must be able to **measure** the values for each variable.

Example) Weight or mass is very easy to measure.

However, love cannot be measured.


Variables
Independent: size of paper
Dependent: distance the plane flies
Controlled: force of throw, design, paper type
Independent
·what is being tested
·the thing in an experiment that is changed
Dependent
·result
·changes based on the independent variable
Controlled
·things we keep the same
THE SCIENCE PENGUIN

1. In scientific experiments dependent variables should be: (25 points)

- changed on purpose by the experimenter.
- ✓ measured and observed.
- held constant.
- none of the above.

2. In scientific experiments the independent variable should be: (25 points)

- chosen by another, independent scientist.
- held constant.
- ✓ changed on purpose by the experimenter.
- ignored.

3. Mark whether each of the following factors is a good choice or bad choice for an independent variable:

Time (5 points)	G
Height (5 points)	G
Sadness (5 points)	B
Where someone was born (5 points)	B
Whether it is night or day (5 points)	

Stop watches, timers meters and inches, cm,

Tally of group of people

4. The variables you keep the same throughout an experiment are called the: (25 points)

- ✓ controlled variables.
- observational variables.
- independent variables.
- dependent variables.
- measured variables.

need to change amount

5. For her science fair project, Maya asks the following question: "I see that some recipes for bubble blowing solution have glycerin and others do not. I want to blow the largest bubbles possible. How does adding glycerin to my bubble blowing solution change the size of the bubbles I can blow with it?" From the list below, mark which variables Maya can ignore as unimportant during her experiment, which variables she needs to try to change during her experiment, and which variables she needs to try to keep the same during her experiment:

The brand of dish detergent used to make the bubble blowing solution (5 points)	control
The size of her bubble wand (5 points)	control
The amount of glycerin added to the bubble blowing solution (5 points)	change (independent)
The weather conditions outside when blowing bubbles (5 points)	control
Whether or not her neighbor's dog is barking (5 points)	ignore

21 minutes