

## CONTROL VARIABLES:

Factors that a scientist wants to keep constant. These are the factors in an experiment that you are NOT testing. By controlling other variables the best you can it helps make your experiment valid (reliable).

\* control group: group you are not experimenting on but are comparing with the testing group.

## INDEPENDENT VARIABLES:

(What I change)

Does NOT depend on something else

ex Does the amount of fertilizer affect how much a plant grows?

INDEPENDENT VARIABLE

DEPENDENT VARIABLE  
(height)

## DEPENDENT VARIABLES:

(What I Observe)

This factor can change as a result of the indep. var.

ex Does practice improve the time it takes to complete a maze?

Independent variable

dependent variable

## Independent + Dependent Variables

- \* Dependent variables are always graphed on the y-axis.
- \* Independent variables are always graphed on the x-axis.
- \* A dependent variable DEPENDS on an independent variable.

DEPENDENT	INDEPENDENT
Amount of paycheck	Number of Hours Worked
Price of Speeding Ticket	Speed you were traveling
Height of Grass	Amount of Rainfall
Speed of Car	Pressure applied to gas pedal
Grade in Algebra 1	Effort in Class

Linear Functions

# Variables



Independent:  
size of paper



Dependent:  
distance the plane flies



Controlled:  
force of throw,  
design, paper type

Independent	Dependent	Controlled
<ul style="list-style-type: none"><li>· what is being tested</li><li>· the thing in an experiment that is changed</li></ul>	<ul style="list-style-type: none"><li>· result</li><li>· changes based on the independent variable</li></ul>	<ul style="list-style-type: none"><li>· things we keep the same</li></ul>

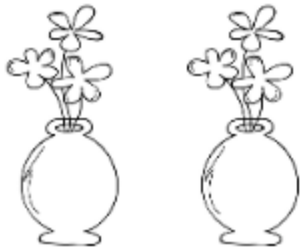
# INDEPENDENT

VS

# DEPENDENT

The part of the experiment that **I** (as the scientist) intentionally change to see if there will be a result.

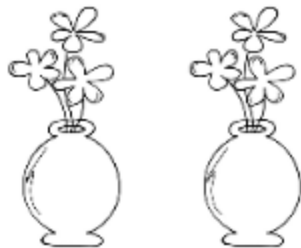
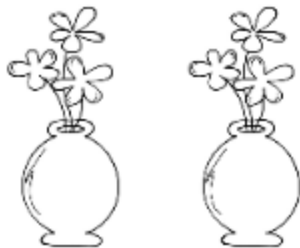
The part of the experiment that is measured or observed. The scientist **D**EPENDS on this collected **D**ATA to draw conclusions.



HOW DOES FOOD COLORING IMPACT WHITE CUT FLOWERS?

# SCIENTIFIC VARIABLES

*For experimental design*



A list of factors that are kept the same to ensure a fair test.

An untested or "normal" group that is used for **COMPARISON!**

# CONSTANTS

*Sometimes called controlled variables*

VS

# CONTROL GROUP

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# Types of Variables

## Independent

The one thing you change.  
Limit to only one in an experiment.

Example:  
The liquid used to water each plant.

## Dependent

The change that happens because of the independent variable.

Example:  
The height or health of the plant.

## Controlled

Everything you want to remain constant and unchanging.

Example:  
Type of plant used, pot size, amount of liquid, soil type, etc.

### Independent Variable



### Dependent Variable



### Controlled Variables



Virtual Lab - [https://www.biologycorner.com/worksheets/scientific\\_method\\_ecb.html](https://www.biologycorner.com/worksheets/scientific_method_ecb.html) European Corn Borer

Virtual Lab - [http://www.glencoe.com/sites/common\\_assets/science/virtual\\_labs/CT08/CT08.html](http://www.glencoe.com/sites/common_assets/science/virtual_labs/CT08/CT08.html) factors affecting fish

Virtual Lab - [https://www.biologycorner.com/worksheets/photosynthesis\\_virtual.html](https://www.biologycorner.com/worksheets/photosynthesis_virtual.html) Photosynthesis

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# Variable Notes

Key Words	Definition/Notes
What is a variable?	• a changing quantity in an experiment
<b>3 Types</b>	
1. <u>Independent Variable (IV)</u> aka <u>manipulated variable</u>	<ul style="list-style-type: none"> <li>• variable being changed/tested</li> <li>• "I" changed... it is what <u>CAUSES</u> the DV to change</li> <li>• graphed on the <u>X-axis</u></li> </ul>
2. <u>Dependent Variable (DV)</u> aka <u>responding variable</u>	<ul style="list-style-type: none"> <li>• variable that is <u>measured</u></li> <li>• it is the <u>EFFECT</u> and response to changing the IV</li> <li>• graphed on the <u>Y-axis</u></li> </ul>
	<p style="text-align: center;">y DRY MIX</p>
3. <u>Constants</u> aka <u>controlled variable</u>	• everything else in the experiment the scientist wants to keep the same