Notes – Variables in a Scientific Investigation

Glue this page in as **PAGE 15** in your I.L.L.

Variable

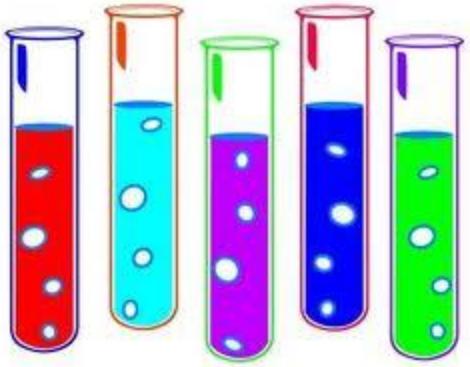
- A factor or condition that can change during an event or investigation

3 Types of Variables

- Scientists identify cause and effect relationships and then look to see if a change in one factor causes a change in other factors in a predictable way

- These factors are known as the independent, dependent, and controlled variables

1. Independent (INPUT)



- A factor that is intentionally changed during an experiment
- ***Causes*** a change
- Answers the question, “What I changed?”
- A fair experiment will only have one independent variable

2. Dependent (OUTPUT)

- A factor that might change as a result of the independent variable
- ***Effects*** of a change
- Answers the question, "What I observed?"
- Changes should be measurable

3. Controlled

- Factors that are intentionally kept the same during an experiment to ensure a fair study
- Answers the question, “What did I keep the same?”
- Will be more than one controlled variable in an experiment

Examples

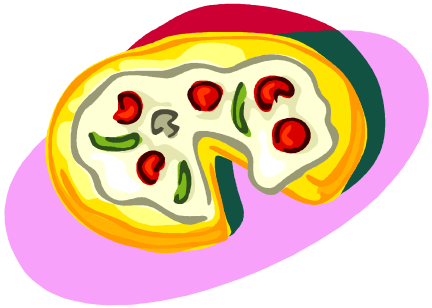
1. **Does more fertilizer make a plant grow faster?**

Independent variable amount of fertilizer used (grams)

Dependent variable plant growth(days)

Controlled variables type of plant, amount of water, amount of sunlight, type of soil, length of experiment (2 weeks)

Examples



2. **Does a larger number of pepperoni on a pizza affect the number of pizzas sold?**

Independent variable amount of pepperoni (number of pieces per pizza)

Dependent variable number of pizzas sold

Controlled variables amount of cheese, size of pizza, type of dough, temperature of pizza

Examples

3. **How does the summer heat affect the finish times of marathon runners?**

Independent variable

Dependent variable

Controlled variables