**Science: Identifying Variables in Controlled Experiments Worksheet**

For each of the following experiments identify the Independent Variable, the Dependent Variable and a list of Controlled Variables. Where possible identify the Experimental Control.

1. What colour of paint (Black, White, Red or Silver) on the outside of a can will cause the temperature of water inside the can to rise the fastest when placed near a light bulb?

**Independent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Dependent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Controlled Variables: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Experimental Control: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

2. How does the amount of salt in water used for watering plants affect the growth of the plants?

**Independent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Dependent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Controlled Variables: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Experimental Control: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

3. How does temperature affect the rate of ripening of picked apples?

**Independent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Dependent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Controlled Variables: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Experimental Control: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

4. How does the amount of light affect the mould growth on bread?

**Independent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Dependent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Controlled Variables: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Experimental Control: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

5. The number of flowers on different breeds of bushes in a greenhouse is recorded every week for two months.

**Independent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Dependent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Controlled Variables: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Experimental Control: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

6. You give forty sunflowers different watering with either pure water or different concentrations of salt solutions. The flowers are split into four groups of ten. After a two-week period, the average height is measured.

**Independent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Dependent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Controlled Variables: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Experimental Control: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

7. You are asked to perform an experiment to see how the voltage of a battery affects the brightness of a lightbulb.

**Independent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Dependent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Controlled Variables: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Experimental Control: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

8. Three groups of redwood trees are kept at different humidity levels inside a greenhouse for 52 weeks. One group is left outside in natural atmospheric conditions. Average height of the trees is measured once a week.

**Independent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Dependent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Controlled Variables: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Experimental Control: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

9. An experiment is conducted to see how the time it takes for a sugar cube to dissolve is changed as the temperature of the water it dissolves in is changed.

**Independent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Dependent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Controlled Variables: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Experimental Control: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

10. Pea plant clones are given different amounts of water for a three-week period. The first group receives 400 milliliters per day. The second group of pea plant receives 200 milliliters per day. The third group receives 100 milliliters per day. The fourth group of pea plants receives 50 mL of water per day. The height of the pea plants is recorded daily.

**Independent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Dependent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Controlled Variables: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Experimental Control: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Science: Identifying Variables in Controlled Experiments Worksheet**

For each of the following experiments identify the Independent Variable, the Dependent Variable and a list of Controlled Variables. Where possible identify the Experimental Control.

1. What colour of paint (Black, White, Red or Silver) on the outside of a can will cause the temperature of water inside the can to rise the fastest when placed near a light bulb?

**Independent Variable: Colour of paint**

**Dependent Variable: Temperature of water**

**Controlled Variables: Amount (volume) of water, type of can, size of can, type of bulb, distance from bulb to can, time…**

**Experimental Control: None**

2. How does the amount of salt in water used for watering plants affect the growth of the plants?

**Independent Variable: Amount of salt**

**Dependent Variable: Growth of plants**

**Controlled Variables: Type of plants, amount of light, amount of water, temperature, type of soil, amount of soil, type of salt…**

**Experimental Control: Plants receiving water with no salt**

3. How does temperature affect the rate of ripening of picked apples?

**Independent Variable: Temperature**

**Dependent Variable: Rate of ripening**

**Controlled Variables: Type of apple, humidity, light, ripeness when picked…**

**Experimental Control: None**

4. How does the amount of light affect the mould growth on bread?

**Independent Variable: Amount of light**

**Dependent Variable: Mould growth**

**Controlled Variables: Type of bread, temperature, humidity, size of bread**

**Experimental Control: None**

5. The number of flowers on different breeds of bushes in a greenhouse is recorded every week for two months.

**Independent Variable: Breed of bush**

**Dependent Variable: Number of flowers**

**Controlled Variables: Temperature, humidity, amount of water, time of watering, amount of sunlight…**

**Experimental Control: None**

6. You give forty sunflowers different watering with either pure water or different concentrations of salt solutions. The flowers are split into four groups of ten. After a two-week period, the average height is measured.

**Independent Variable: Concentration of salt solution**

**Dependent Variable: Average height**

**Controlled Variables: Amount of water, type of soil, amount of sunlight, temperature, humidity, soil type, size of pot…**

**Experimental Control: Flowers receiving pure water**

7. You are asked to perform an experiment to see how the voltage of a battery affects the brightness of a lightbulb.

**Independent Variable: Voltage of battery**

**Dependent Variable: Brightness of bulb**

**Controlled Variables: Type of bulb, how the circuit is wired,**

**Experimental Control: None**

8. Three groups of redwood trees are kept at different humidity levels inside a greenhouse for 52 weeks. One group is left outside in natural atmospheric conditions. Average height of the trees is measured once a week.

**Independent Variable: Humidity level**

**Dependent Variable: Average height**

**Controlled Variables: Temperature, soil type, amount of water, sunlight…**

**Experimental Control: Group of trees left outside**

9. An experiment is conducted to see how the time it takes for a sugar cube to dissolve is changed as the temperature of the water it dissolves in is changed.

**Independent Variable: Temperature of Water**

**Dependent Variable: Time to dissolve sugar cube**

**Controlled Variables: Amount of water, size and type of sugar cube, amount of agitation, type of container**

**Experimental Control: None**

10. Pea plant clones are given different amounts of water for a three-week period. The first group receives 400 milliliters per day. The second group of pea plant receives 200 milliliters per day. The third group receives 100 milliliters per day. The fourth group of pea plants receives 50 mL of water per day. The height of the pea plants is recorded daily.

**Independent Variable: Volume of water**

**Dependent Variable: Height of pea plants**

**Controlled Variables: Temp, sunlight, soil, pot size, time of watering, fetilizers…**

**Experimental Control: None**

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