Welcome to Investigative Science with Mr. Fireng

Thursday, August 04, 2016

1. Get out your stampsheet
2. Get out your homework
3. Write tomorrow’s homework in agenda
4. START WORKING QUIETLY
Learning goal: Properly apply all steps in the scientific method when problem solving.

Identifying the parts of a experiment

**Qualitative observation:** An observation using your senses, just words, no numbers.

**Quantitative observation:** An observation that includes a number and/or a measurement.

**Inference:** an interpretation that explains an observation.

**Hypothesis:** A possible explanation for a set of observations or to a scientific question; must be testable.

**Control group:** A group that remains under normal conditions during an experiment.

**Independent (Manipulated) variable (IV):** The variable you manipulate in the experiment.

**Dependent (Responding) variable (DV):** The variable you measure, it is affected by changing the IV.

**Experimental Question:** A formal cause-effect question. Asks about the relationship between two variables.

**Conclusion:** A summary of what is learned in an experiment.
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**Identifying the parts of an experiment**

But how are experiments developed? Not really one way.. This is just one path.

1. Make an observation (senses, instruments, data, previous experiments, etc.)
2. Ask an informal, how, what or why question about observation
3. Find evidence that helps you come up with an answer to your informal question
4. Make an inference (informal hypothesis) that may explain an observation and answer your question
5. Design an experiment that will help answer your question
6. Identify variables, one variable you will change (independent), one variable you will measure (dependent) and the variables you need to control
7. Identify the control group to compare your results to.
8. Change your informal question into an experimental question (How does... affect?)
9. Change the inference to a formal hypothesis (if, then, because...)
10. Conduct experiment and determine if the data supports or disproves your hypothesis.
11. Report your results!! Ask new questions!!
Mr. Fireng tried salted caramel for the first time and he thought it tasted delicious! He wondered if salt can improve the taste of sweets? He remembers reading an article that stated that combining salt sugar and fat can improve the taste of food. So he thought that yes, adding more salt to sweets would improve the taste. He decided to test this by adding various amounts of salt and measuring the quality of the ice cream. He came up with the experimental question; how does the amount of salt affect the quality of ice cream? His hypothesis was, If the amount of salt increases, then the quality of the ice cream will increase because the salt will make it sweeter. He made four batches of ice cream. One batch of ice cream had no salt. The other three had more and more salt. He tasted the ice cream and rated the texture, saltiness, sweetness and overall flavor on a scale from 0-4. He discovered that his hypothesis was supported by the data! As the amount of salt increased, the ice cream tasted better and better!
Identifying the parts of an experiment

- What was the observation?
- What was the informal question that led to the experiment?
- What evidence did he use to answer the question?
- What was his inference (informal hypothesis)?
- How was he going to test the question?
- What is the independent variable?
- What is the dependent variable?
- What is the control group?
- What was the experimental question?
- What was Mr. Fireng hypothesis?
- Did the results support or disprove Mr. Fireng’s hypothesis?
- What new questions could Mr. Fireng ask?
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What was the observation? **Look for something that was noticed, seen or experienced!**
Identifying the parts of an experiment

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What was the informal question that led to the experiment? This is a basic, who, what or why question. This can be changed to an experimental question later...
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What evidence did he use to answer the question? Look for observations, data from instruments, information that was heard or read, could be data from a previous experiment.
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What was his inference (informal hypothesis)? This uses previous experience and evidence that explains the observation and answers the informal question.
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How was he going to test the question? Explanation of test, here is where the variables are identified
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What is the independent variable? The variable that is being changed.. “manipulated”

What is the dependent variable? The variable that is being affected by the change, the one being measured “responding”
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What is the control group? In the experiment, one test group is not changed, it is “controlled”
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What was the experimental question? Must be “How does (independent variable) affect the (dependent variable)?
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What was Mr. Fireng hypothesis? **Must be “if the (independent variable) increases/decreases/changes then the (dependent variable) will increases/decreases/changes because….”**
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Did the results support or disprove Mr. Fireng’s hypothesis? Look at the results! Remember, never say PROVE! ONLY SUPPORTS..
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What new questions could Mr. Fireng ask? Does it work with other foods? Does the type of salt matter? Ect..