

Scientific Method

A way of thinking in which scientists follow steps to _____ and _____

P _____ (ask a question)

(conduct research)

H _____ (formulate an educated guess)

E _____ (test hypothesis)

O _____ (collect data)

C _____ (analyze and report results)

R _____ (retest based on results)

Start with a _____ (What is it that we are trying to figure out?)

* usually stated as a question NEVER yes or no types of questions

The form of the question should be: Which or How will the _____ variable affect the _____ variable.

Examples:

How will the height of the ramp affect the distance the car will travel from the end of the ramp?

Which ratio of salt to water will freeze in the shortest amount of time?

Next you formulate a _____

This is an educated guess/prediction based on _____

gathered from doing research or personal experiences.

* predict using a cause and effect statement (usually if-then statement)

Examples:

I think that the car on the 8cm high ramp will travel the furthest distance from the end of the ramp because it is the option that will have the most potential energy to convert to kinetic energy.

I think that the ice cube with the least amount of salt (1 tsp) will freeze in the shortest period of time because when I add salt to the driveway it doesn't allow the water to freeze as fast.

Now you are going to set up an _____ to help solve or answer your question.

- Design the experiment to clearly show a one particular factor causing a certain outcome.

- What is the procedure you will follow?

- What materials would someone need to conduct your experiment

TERMS TO KNOW!!!

Factor: _____

Control variables: _____

Independent Variables: _____

Dependent Variables: _____

As you conduct the experiment you will be recording the _____ (data)

Observations can be numerical (numbers ie time, length, mass, volume etc) but they can also be words that describe.

This is where data is recorded in things such as data tables.

* The more data that is recorded, trials completed, the more certain we are that we did good work and it wasn't just a fluke. _____ trials is a minimum base number to work with. More is better though.

On to the part where we actually find out what we have learned! Now we have to analyze the results and identify our _____

WRITING A GOOD CONCLUSION

1. RESTATE YOUR HYPOTHESIS
 2. RESTATE YOUR PROCEDURES AND DATA
- What actually happened?

3. TELL WHETHER YOUR HYPOTHESIS WAS CORRECT OR NOT
4. TELL OF ANY CIRCUMSTANCES OR ERRORS MAY HAVE CHANGED/AFFECTED YOUR RESULTS.
5. REFLECT BACK ON THE PROBLEM.
What did you learn?

Possible sentence starters for your conclusion:

The original hypothesis was _____. The procedures used _____ (usually just a general overview). From this, the data indicates that _____.

Therefore the hypothesis was found to be _____ because _____. An error that may have affected our results _____. At the end of this lab I have learned _____.