

The Scientific Method

What is the scientific method?

- a _____ that is used to answer questions about the world around us
- begins with a _____ to be answered or _____ to be explained and provides a method for conducting and analyzing an experiment

Identify the Problem – Ask a Question

- What do you want to know or explain?
- Testable questions are written to show an obvious _____ and _____ relationship
- In all testable question there is a cause and effect relationships. These are called variables

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- the part that you are changing in the test
 - i.e. ball release height

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- The part that changes because of the IV
 - i.e. ball bounce back height

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- these are the parts that you could also change, but we keep them the same in the test to make sure only the IV is affecting the outcome
 - i.e. type of ball, inflation of ball, type of surface, etc.

Hypothesis/Prediction

- what you think will happen – a _____
- based on your reasoning or previous knowledge, suggest an _____ or reason why the independent variable affects the dependent variable
- It does not matter if your prediction is _____ or _____!
- Hypothesis statements are set up in a specific way:
 - _____ and _____ are used to separate the _____ and _____
 - Control variables are generally not listed in the hypothesis
 - i.e. if the ball is released from a certain height then it will always bounce back at a lower height

Create an Experiment

- Develop a procedure for a _____ experiment and address the _____ rules

Perform an Experiment - Observations

- Follow the _____ in your procedure to perform your experiment
- There are many ways to gather information about an observation
- _____ analysis includes observations of colour, state, smell, texture, taste, hardness, etc.
- _____ analysis includes measurements of height, mass, temperature, etc.
- Observations should be _____, _____ and _____
- This usually involves putting your gathered information into _____, _____, _____, and _____

Analyze the Data

- Is the data reliable?
- Does the data and observations from the experiment support your hypothesis?

Communicate Results – Conclusion

- Write a conclusion that summarizes the important parts of your experiment and the results
- Once the experiment has concluded, the experimenter must go back to the hypothesis to see whether the results _____, _____ or _____ the hypothesis
- The conclusion should state if the hypothesis was _____, the results that proved this conclusion and provide an explanation for the results