

Name: _____

DUE: _____

Teacher: _____

SENT HOME week of Jan 11-15, 2016

First 4 steps of the scientific method are ...

What is a hypothesis?

2

1

3 hypothesis

4

One of the most important skills a scientist has is his/her ability to write a good hypothesis. By following the scientific method, you came up with a testable question that you want to answer, you did some initial research, and then before you set out to answer the question by performing an experiment and observing what happens, you will first clearly identify what you "think" will happen.

What you "think" will happen, of course, should be based on your preliminary research and your understanding of the science and scientific principles involved in your proposed experiment. In other words, you don't simply "guess." You're not taking a shot in the dark. You're not pulling your statement out of thin air. Instead, you make an "educated guess" based on what you already know (experience) and what you have already learned from your research.

If you keep in mind the format of a well-constructed hypothesis, you should find that writing your hypothesis is not difficult to do. You'll also find that in order to write a testable hypothesis, you need to understand what your variables are for your project. It's all connected!

Scientists use an experiment to search for cause and effect relationships in nature. In other words, they design an experiment so that changes to one item cause something else to vary in a predictable way.

These changing quantities are called variables. A variable is any factor, trait, or condition that can exist in differing amounts or types. An experiment usually has three kinds of variables: independent, dependent, and controlled.

- Independent – the cause; the one factor that is changed by the scientist
- Dependent – the effect; the factor(s) that is observed and measured by the scientist
- Controlled – the factors that must be kept the same by the scientist

Only one change at a time

Effect=Results=Data

The effect is the **DATA** you collect during your experiment. Which is observing and/or measuring what is happening.

Testable question

Variables

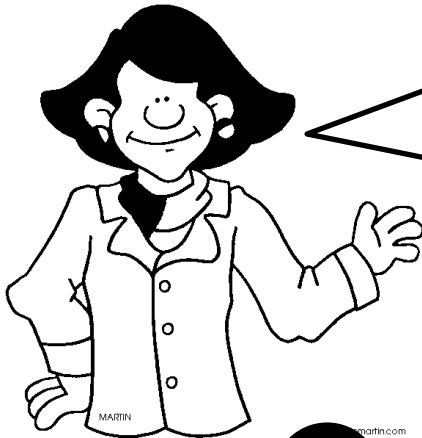
Hypothesis

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How do you write a hypothesis?

One of the most important skills a scientist has is his/her ability to write a good hypothesis. By following the scientific method, you came up with a testable question that you want to answer, you did some initial research, and then **before** you set out to answer the question by performing an experiment and observing what happens, you will first clearly identify what you "think" will happen - this is the hypothesis.

1

FIRST - Write your testable question

Remember a good testable question has 2 parts: cause and effect

How does changing the height of the track (20, 40, 60, 80 cm) affect whether the marble can loop the loop?

2

SECOND - Identify your variables

Remember to list how the CAUSE will be changed ... add details!

CAUSE = independent variable

the height of the track (20, 40, 60, 80 cm)

EFFECT = dependent variable

whether the marble can loop the loop

KEEP the SAME = controlled variables

- same size loop
- same starting point (length)
- same size marble

Add details by listing the different ways in which the cause will be changed

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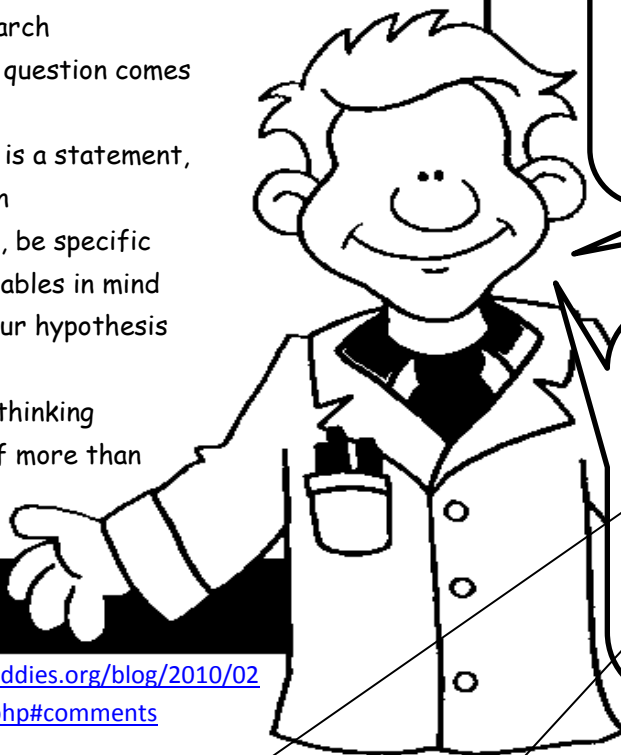
MARTIN

Hypothesis Tips:

- Do your research
- The testable question comes first
- A hypothesis is a statement, not a question
- Make it clear, be specific
- Keep the variables in mind
- Make sure your hypothesis is "testable"
- Explain your thinking
- Don't bite off more than you can chew

Source:

<http://www.sciencebuddies.org/blog/2010/02/a-strong-hypothesis.php#comments>



When you write your hypothesis, it should be based on your "educated guess" formulated by your research and experience. Similarly, **the hypothesis should be written before you begin your experimental procedures—** not after the fact.

Explain your thinking

Use one of these two formats to write your hypothesis.

- I think **C** will **E** because according to _____.
- If **C** then **E** because according to _____.

3

THIRD - Write your testable hypothesis

Remember a good hypothesis has a cause (independent) an effect (dependent). A hypothesis is what you think is the "possible answer" to your testable question.

Example 1

I think that an **80 cm** high ramp will make **the marble loop the loop** because according to **my research the greater the height (potential energy) the faster the marble will move (kinetic energy).**

Example 2

If the height of the ramp is **80 cm** then **the marble will loop the loop** because according to **my research the greater the height (potential energy) the faster the marble will move (kinetic energy).**