

THE SCIENTIFIC METHOD

THE SCIENTIFIC METHOD

*** set of steps that all research must follow**



Click here to watch Tim and Moby discuss the scientific method on BrainPop

Click here to watch a video clip from teacher tube.

http://teachertube.com/viewVideo.php?video_id=114538&title=Scientific_Method_Everyday

THE SCIENTIFIC METHOD

ASK A QUESTION

ASK A QUESTION

* The question is based on your observations (both qualitative and quantitative). Who, What When, Where, How, Why

* The question must be about something that can be measured or experimented on.

Write 3 questions that you could do an experiment about. They should end with a question mark!!

1)

2)

3)

THE SCIENTIFIC METHOD

ASK A QUESTION

RESEARCH THE QUESTION

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ASK A QUESTION
RESEARCH THE QUESTION

RESEARCH THE QUESTION

- * Don't start from scratch.
- * Look up what is already known about your question.
- * Use the internet, library, and other scientists.

Use a table with question words:

Who:

What:

Where:

When:

Why:

How:

THE SCIENTIFIC METHOD

ASK A QUESTION

RESEARCH THE QUESTION

WRITE A HYPOTHESIS

WRITE A HYPOTHESIS

- * Your best guess about what will happen based on your observations
- * Must be testable by making an experiment.
- * A STATEMENT about what will happen and WHY.

If _____ is related to _____
then _____.

This term should be the dependent variable.

This terms should be the independent variable.

This part is the explanation

Writing a Hypothesis

1. Coffee may stunt your growth.
2. The size of a leaf may affect the size of the tree.
3. The depth of the water may affect the color of fish.
4. Bacterial growth may be affected by temperature.
5. Ultra violet light may cause skin cancer.
6. Temperature may cause leaves to change color.

Let's rewrite these as hypotheses...

1. If _____ is related to _____
then _____.

2. If _____ is related to _____
then _____.

3. If _____ is related to _____
then _____.

Answers.....

Let's rewrite these as hypotheses...

1. If _____ growth _____ is related to _____ drinking coffee _____ then _____ someone who drinks a lot of coffee will be short _____.

2. If _____ tree size _____ is related to _____ leaf size _____ then _____ a tree with large leaves will grow tall _____.

3. If _____ fish color _____ is related to _____ depth of water _____ then _____ fish who live in deep water will be a dark color _____.

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RESEARCH THE QUESTION

WRITE A HYPOTHESIS

EXPERIMENT

EXPERIMENT

- * A test to see whether your hypothesis is right or wrong.**
- * Must be Fair.**
- * Only one factor should be changed. Everything else must stay the same.**
- * The factor you change is called the variable.**
- * The factors you don't change are the controls.**
- * Repeat the experiment over and over to make sure the results are not a mistake.**

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ASK A QUESTION

RESEARCH THE QUESTION

WRITE A HYPOTHESIS

EXPERIMENT

COLLECT DATA

COLLECT DATA

- * Keep a science journal with all the details of your experiment.**
- * Write down everything you do.**
- * Make all measurements and record them.**

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ASK A QUESTION

RESEARCH THE QUESTION

WRITE A HYPOTHESIS

EXPERIMENT

COLLECT DATA

ANALYZE DATA

ANALYZE DATA

- * Go back through your science journal and look at your data.**
- * Place the data into tables and graphs to be able to "see" what happened.**

THE SCIENTIFIC METHOD

ASK A QUESTION

RESEARCH THE QUESTION

WRITE A HYPOTHESIS

EXPERIMENT

GATHER DATA

ANALYZE DATA

MAKE A CONCLUSION

MAKE A CONCLUSION

Compare your results to your hypothesis

Does your hypothesis match your results?

YES?

**your experiment is ready to
be repeated by other
scientists and yourself**

NO?

**your experiment needs
modified to see if you
can get the hypothesis
and result to match**

Communicate your results in a final paper or project.

How much do you know about the scientific method?

Click here for a Quiz!!

<http://www.brainpop.com/science/scientificinquiry/scientificmethod/quiz/>