

Divide your paper sections

Now:

- Heading
- Notes

Later:

- Study ?s
- Summary

The diagram shows a spiral-bound notebook page with blue horizontal lines and two vertical red margin lines. A table is drawn with black lines. The table has two columns: 'Title of Notes' and 'Date'. The first row is empty. The second row contains the text 'Study ?s' and 'Level 1,2 & 3' in the left column, and a bulleted list of instructions in the right column. The third row is empty. The fourth row contains the text 'Summary' and '3-5 sentences' in the left column, and is empty in the right column.

Title of Notes	Date
Study ?s Level 1,2 & 3	<ul style="list-style-type: none">• Take Notes during presentation• Underline key words• Skip a line after each• Slide• Abbreviate
Summary	
3-5 sentences	

Study your notes

- Review your notes.
- Quiz your self with the study questions.
- Review your summaries.

John Q. Student
Biology 101
April 1, 2000

Phylum: Platyhelminthes
Subphylum: Cestodaria

Characteristics:
• 3 parts: prosoma, opisthosome, and pedicels
• prosoma (first pair of appendages) used for feeding
• opisthosome (second pair of appendages) used for sensory purposes

Prosoma: sensory, feeding, and locomotor tags
Opisthosome: feeding, locomotion, reproduction

Pedicels: feeding, locomotion, reproduction

Phylum Platyhelminthes is made up of subphylum Cestodaria. Subphylum Cestodaria is characterized by two part called prosoma and opisthosome. The prosoma and opisthosome are sensory, feeding, and locomotor tags. The pedicels are the first appendage and refers to the suckers. The opisthosome are the 2nd pair of appendages, and they are used for sensory purposes: feeding, locomotion, and reproduction.

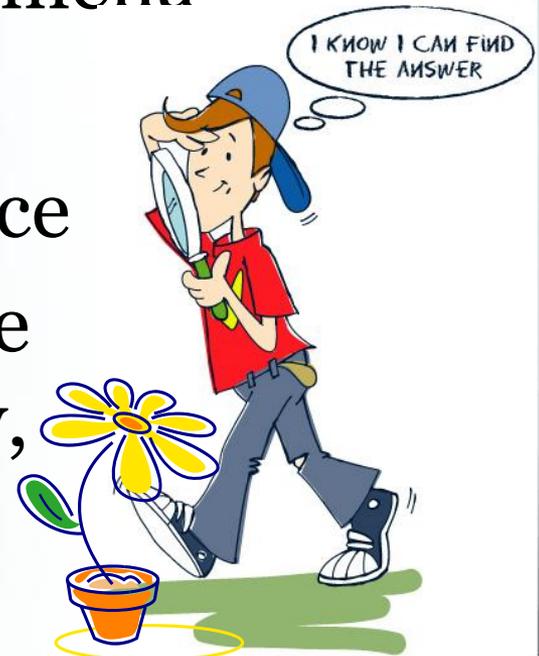
The Scientific Method

THINK like a Scientist.
RECORD like a Scientist.
REFLECT like a Scientist.



The Scientific Method

- **“Science”** derived from Latin **‘to know’**
- Way of **asking** and **answering questions** about natural phenomena
- **Pseudoscience = FALSE Science**
- Science does **NOT** investigate the “supernatural” or study morality, religion, etc.



Laws, Theories & Models

Law: A rule that describes patterns observed in nature.

Ex. *Law of Gravity, Laws of Motion*

Theory: A logical explanation of WHY or HOW things work in nature based on observations and experimentation. Ex. *Atomic Theory, Big Bang Theory*

Model: a diagram or 3D representation of an object or process.

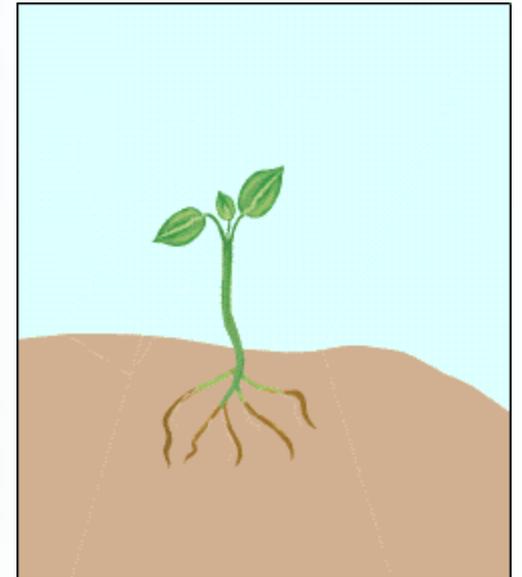
- *Theories and laws are well-accepted by scientists, but... **THEY ARE NOT SET IN STONE!***
- *They are revised when new information is discovered.*



1. Problem/Question

- A **problem** is a question based upon observations that can be tested through experimentation.

Ex. What is the effect of **sunlight** on **plant growth**?



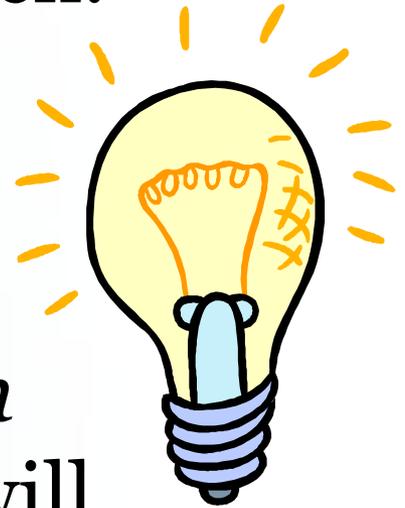
2. Observation/Research

- **Observe** the world using your senses (sight, sound, taste, touch, smell) and **research** your problem using the internet or books or journals.



3. Hypothesis/Prediction

- **Predict** a solution to the problem based on your research.
- “**If...then...because...**”



Ex. If **sunlight** *has an effect on* **plant growth**, then plants will grow larger in the sun because it is needed for photosynthesis.

4. Experiment

- **Test the hypothesis** with a **step by step** procedure.
- It is **clear** and **detailed** so another scientist can replicate your experiment.
- List all **materials**.



2 types of Variables

Independent Variable (IV)

- What the **investigator** (YOU) **changes**
- Known as the “**Experimental Group**”

Ex. **AMOUNT OF LIGHT** is changed for each plant.

Dependent Variable (DV)

- Changes **due** to the IV
 - What you **measure**
- Ex. measure the **PLANT GROWTH** (cm)

Control Group & Constants

- Control group

The group or sample that is **used as a standard for comparison.**

Ex. The **plant in the dark** is COMPARED to the experimental group (light).

- Constants

The factors in the experiment that need to **stay the same** between the experimental group and the control.

Ex. **amount of soil, nutrients, water,** etc. is CONSTANT for all plants

5. Collect Data



- Information and observations collected during the experiment.

QUALITATIVE

- Descriptions of observations
- “What it **LOOKS** like”

Ex. Plant C has dried up and lost all of its leaves

QUANTITATIVE

- Numerical measurements
- “**NUMBERS** with units”

Ex. 15 cm

Myth Busters in Action, p. 18

Write down examples from the video showing how the Myth Busters followed the steps of the Scientific Method.

1. Problem
2. Observation/Research
3. Hypothesis
4. Experiment
5. Collect Data
6. Analyze Results
7. Conclusion
8. Report Findings

6. Analyze results

- **Display data using a graph to show patterns.**

Ex. Line graph, bar graph, pie chart, etc.



DV



IV

Precision vs. Accuracy

Precision

- How close the measurements are to **each other**.

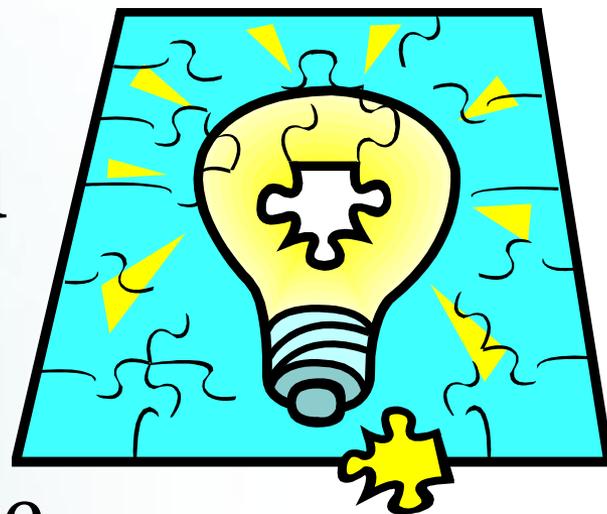
Accuracy

- How close a measurement is to the **actual (true) value**.

- Measure carefully (precisely)
- Collect data in multiple **trials** (repeated tests) to increase accuracy.

7. Conclusion

- The **solution** to the problem.
- State whether your hypothesis is **accepted** or **rejected**.
- **Summarize** and **explain** the significance of your results.
- Sources of **error**, etc.



8. Report Findings

- **Present your information** to others so they can replicate your findings.
- **Retesting** by other scientists verifies your results.



Think you can name all 8 steps?

- 1. Problem**
- 2. Observation**
- 3. Hypothesis**
- 4. Experiment**
- 5. Collect Data**
- 6. Analyze Results**
- 7. Conclusion**
- 8. Report findings**



Any Questions?

