**The Scientific Method**

* An organized way to solve a problem through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	+ *Reality check: there is not a universal research method called, ” the scientific method” it does not exist in actual science laboratories.*

**The Process**

* Define/State the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Collect/Gather \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Form a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Design an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Data
* Form a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ your findings
	+ *Reality check: scientist may skip, or omit several steps in this process*

**Define/State the Problem**

* Form a question about a specific \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	+ Ex: Why is lightening attracted to tall structures?

**Collect/Gather Information**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Make \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Form a Hypothesis**

What is a hypothesis?

* + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ explanation based on your \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Must meet \_\_\_\_\_\_\_\_\_\_\_\_\_ criteria
	+ Testable
	+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ must be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Can be written as an if, then statement.

**Designing a Controlled Experiment**

* Devise a way to test your hypothesis.
	+ How will you perform your experiment?
	+ What materials will you need?
	+ How will you record your data?
* Must have\_\_\_\_\_\_\_\_\_ key variables:
	+ **Independent variable**
		- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- Key words: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ **Dependent variable**
		- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ variable.
		- It is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ being \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	+ Key words: measured, observed, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ **Control**
		- Standard for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- Does \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ receive the \_\_\_\_\_\_\_\_\_ (no treatment)
	+ **Constant(s)**
		- \_\_\_\_\_\_\_\_\_\_\_\_\_ that are kept the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for each test subject
		- Key words: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ amounts

**Collect and Analyze Data**

* What is data?
	+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ observations or information
* There are two types of data:
	+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_tative (Quality)
		- Uses the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- Ex: taste, smell, sound, behavior, etc.
	+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_itative(Quantity)
		- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- Ex: 10g, 50cm, etc.
* Scientist use the metric system to collect data:
	+ Based on units of 10
	+ Basic Units of measurement:
		- Volume: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (L)
		- Length: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (m)
		- Mass: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(g)
		- Temperature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (0C)
	+ Used in most countries except for the US
* Data is usually recorded in:
	+ Tables
		- I.V. listed in the right column
		- D.V. listed in the left hand columns
	+ Graphs
		- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ located on the \_\_\_\_\_\_\_\_\_\_-axis
		- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ located on the \_\_\_\_\_\_\_\_\_-axis

**Form a Conclusion**

* Should state if your hypothesis was \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Publish Your Findings**

* Write a lab report
* Submit your findings to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ journal

**Theory**

* + Scientific Theory- a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of why things work based on hypotheses that have been tested many times.

Sometimes Theories can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_!

* + remember science is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and subject to change as technology advances.

Theory of Spontaneous Generation

* Stated that living things can arise from non-living matter. (Aristole)
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ experiment proved that living things came from other living organisms.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ confirmed that the theory of spontaneous generation was wrong.