Thinking Like A Scientist

Introduction to the Scientific Method

Adapted from Katie Rose

Scientific Method

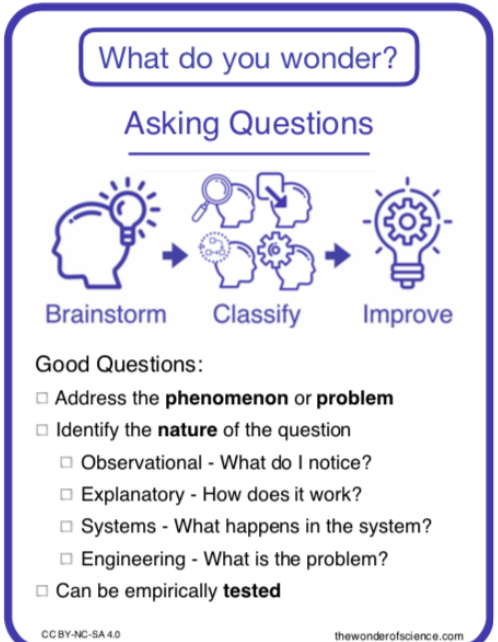
Take a minute to write down the order of the scientific method.

1. Observation
2. Hypothesis
3. Experimentation
4. Data Collection
5. Analyzing Results

All scientists begin a research project with the same curious intention... they ask *WHY* and *HOW* a natural phenomenon occurs.

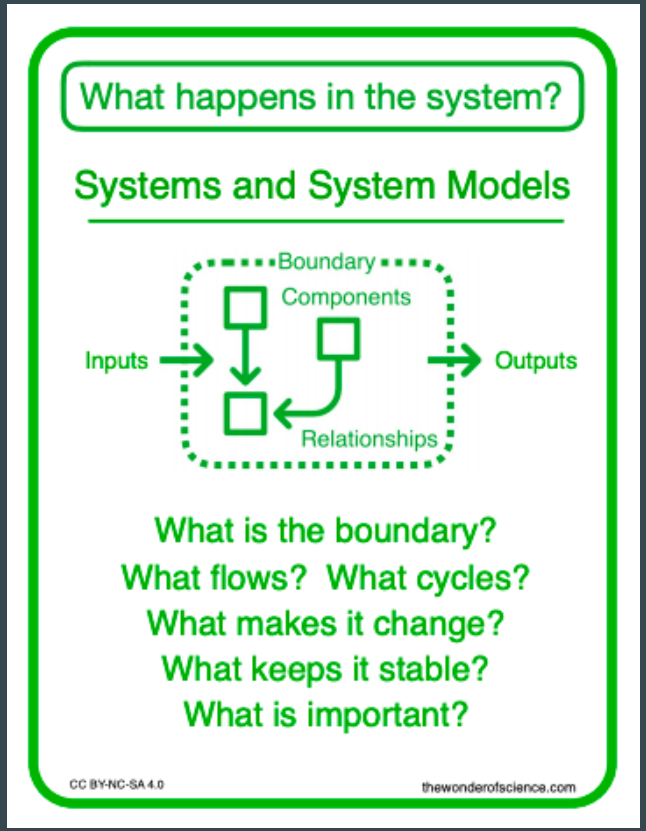
Natural phenomenon- something this is observed to happen or exist

Predict the natural phenomenon that is causing movement of the cough droplets.



Now listen carefully and **identify** the natural phenomenon.

Construct a model of cough droplet movement after a heavy cough.



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Now that you've observed the phenomenon and the problem with cough droplet movement that could contain covid-19 virus and infect other people nearby, **propose a solution** to the problem.

The most realistic and feasible solution is to wear a face mask.

- **Create a hypothesis** about the effect of cough droplet movement when wearing a face mask. **Can use the "If... then..." format for writing a hypothesis*
- **Construct a second model** hypothesizing the movement of cough droplets with a face mask being worn.

Now let's watch what occurs when a face mask is worn.

MARK Method to the experiment

M= Modify

A= Add

R= Remove

K= Keep

Using a different colored pen, highlighter, or marker reevaluate your **second model** of cough droplets movement while a face mask is worn.

You should use each component at least once, some you may use more than once.

Watching the experiment one last time, **identify** the:

-independent variable(s)

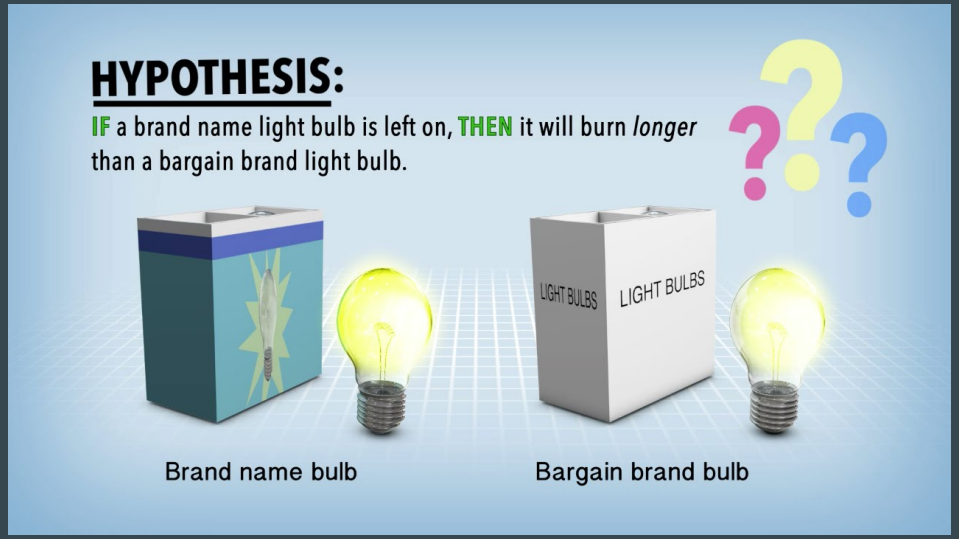
-dependent variable(s)

- and control(s)

Experimental Variables

- There are three kinds of variables
- **Independent variable-** factors that you manipulate in an experiment (What I change)
- **Dependent variable**- factors you observe or measure (What I observe)
- **Controlled Variable-** other factors you keep constant so they don't affect what you are testing (What I keep the same)

What are the variables for this experiment? What is the INDEPENDENT, DEPENDENT and some CONTROLLED variables?



Adapted from Nucleus Medical Media

Creating a CER

Now let's make a CER based on how wearing a face mask redirects movement of cough droplets due to thermal currents.

C= Claim E= Evidence R= Reasoning

1. **Make a claim**: *Make an assertion that is based on evidence or knowledge.* (one sentence)
2. **Justify** the claim: *Provide evidence to support, qualify, or defend a claim, and/or provide reasoning to explain how that evidence supports or qualifies the claim.* (should include the natural phenomenon, cough droplet movement through thermal currents)