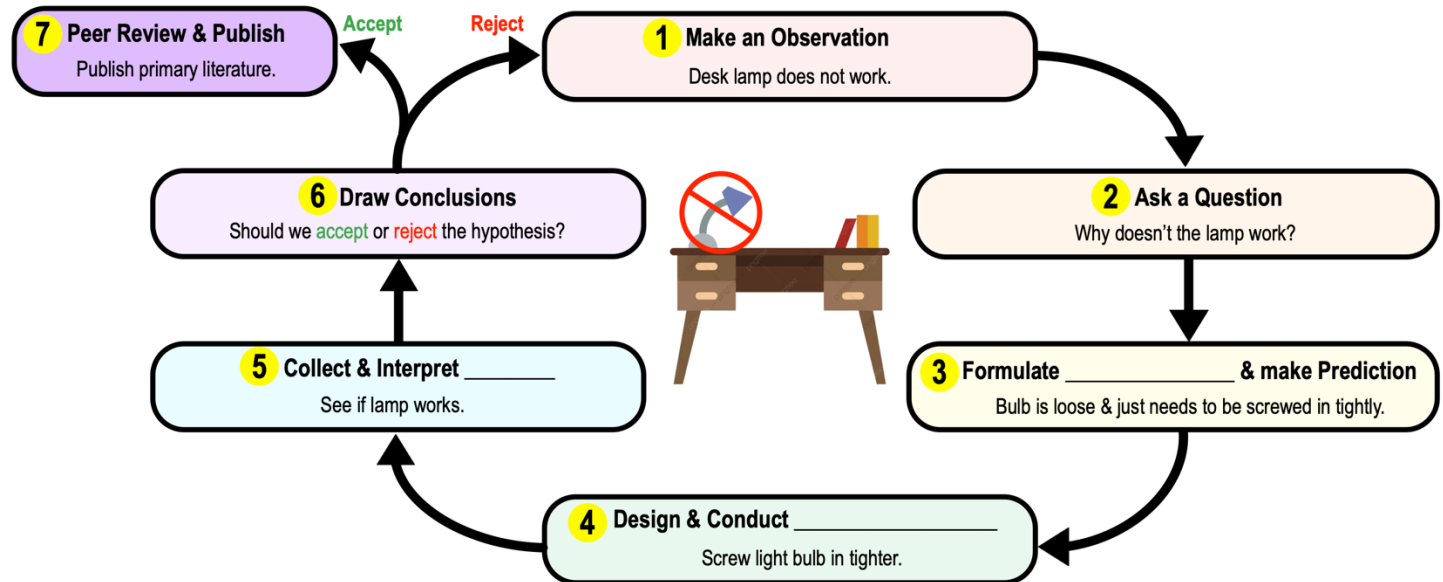


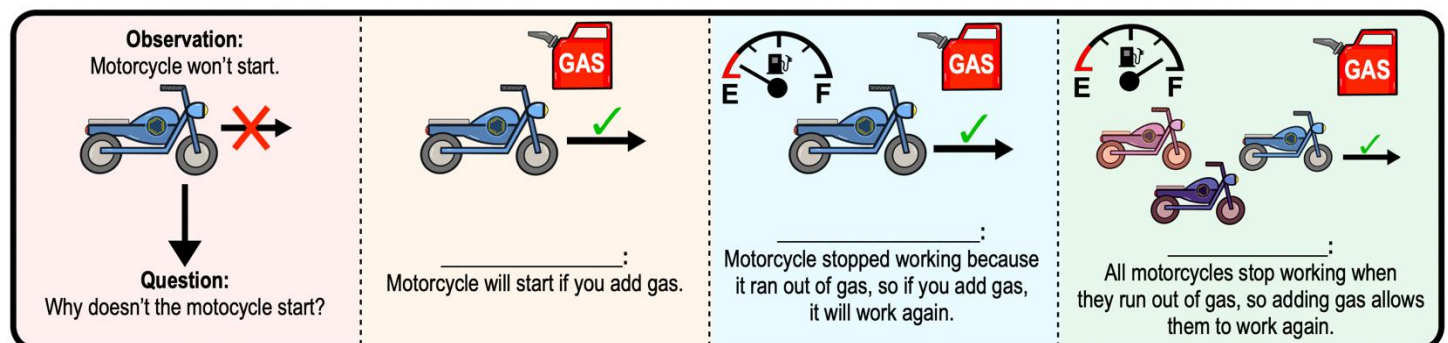
CONCEPT: SCIENTIFIC METHOD

- **Question:** How can you trust the information that you learn from your textbook?
 - You can trust it because the info in your textbook has been subject to the _____ *method*.
- **Scientific Method:** a procedure used to _____ questions, _____ ideas, & _____ scientific knowledge.
 - Scientific method *starts* with an _____ & a _____.



Predictions, Hypotheses, & Theories

- _____: an expected *outcome* of an event that can either be correct or incorrect.
 - Predictions *only* address the answer to “_____ will happen?”
- _____: a proposed & *testable explanation* for an observation.
 - Hypotheses address the answers to “*what* will happen?” & “_____ it will happen?”
 - Therefore, a good *hypothesis* _____ a *prediction*.
- _____: a testable & _____ hypothesis of many observations, supported by a large body of evidence.



- Technically, hypotheses & theories can never be proven correct, but they can be *falsified* (proven incorrect).

CONCEPT: SCIENTIFIC METHOD

EXAMPLE: A scientist observed a new phenomenon and wonders how it happens. What is the next step in their study?

- a) Observe. b) Experiment. c) Design experiment. d) Peer review. e) Hypothesize.

PRACTICE: Which of the following shows the best order of steps of the scientific method?

- a) Observation → Data Analysis → Hypothesis → Conclusion → Peer Review & Publish → Experiment.
b) Observation → Hypothesis → Experiment → Peer Review & Publish → Analysis → Conclusion.
c) Observation → Hypothesis → Experiment → Data Analysis → Conclusion → Peer Review & Publish.
d) Experiment → Hypothesis → Observation → Data Analysis → Conclusion → Peer Review & Publish.

PRACTICE: A scientist observes that even after sterilizing a broth, cells reappear in the broth over time. The scientist then asks: “Why do cells reappear in the broth after sterilization?” and designs/conducts an experiment. Considering this, appropriately label each of the following blanks as either a “prediction, hypothesis or theory.”

_____ : Cells will only appear in the broth exposed to a source of preexisting cells.

_____ : Cells appear only when preexisting cells grow & divide; therefore, cells only appear in exposed broths.

_____ : All organisms consist of cells & all cells come from preexisting cells.

Basic Theories of Biology

- There are _____ basic theories of biology:

Theory	Concept
1 _____	All organisms are made of cells, & all cells come from <i>preexisting</i> cells. 
2 _____	All organisms maintain a relatively consistent internal environment. 
3 _____	All organisms <i>evolved</i> from a single common ancestor. 

PRACTICE: Which of the following statements about the cell theory is false?

- a) All living organisms are made of cells. b) All cells arise spontaneously.
c) Cells are the basic structural & functional unit of life. d) All cells arise from preexisting cells.