

Experimental Design Notes

8th grade

Observation & Inference



modified by Liz LaRosa www.middleschoolscience.com 2009, from original posted at:
www.science-class.net/PowerPoints/Observation_Inference_8th.ppt

Observation

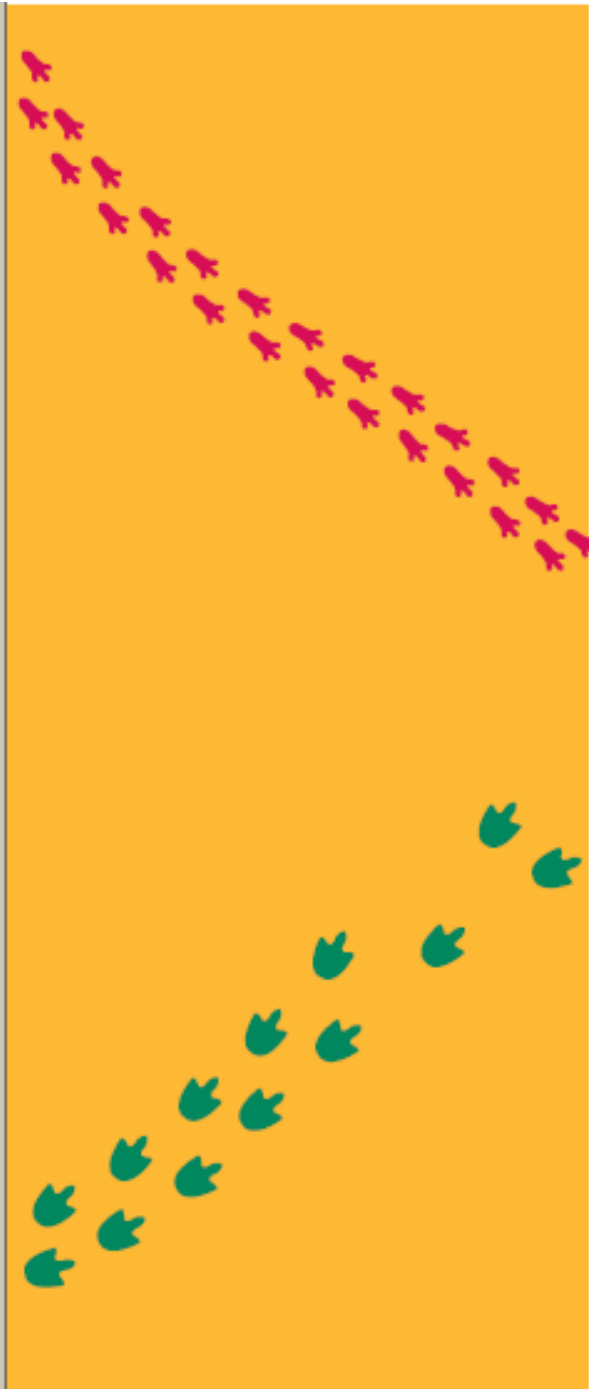
- Information collected and measured using your senses.

Inference

- Conclusion made based on observations

Examples

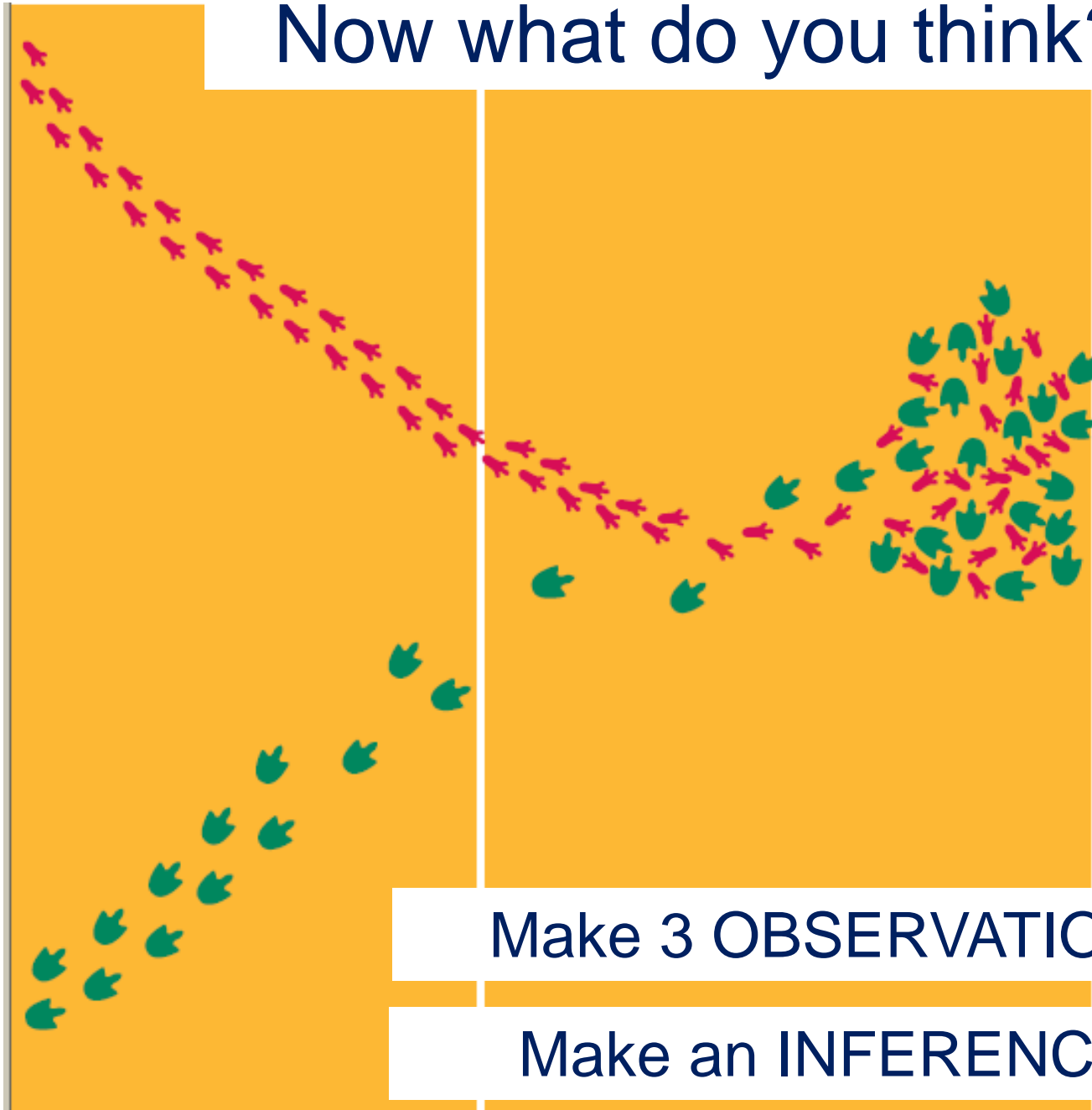
- **Observations:**
 - I hear people screaming
 - I smell cotton candy, popcorn, and hamburgers
 - I see a lot of people
- Inference = ?



Make 3 OBSERVATIONS

Make an INFERENCE

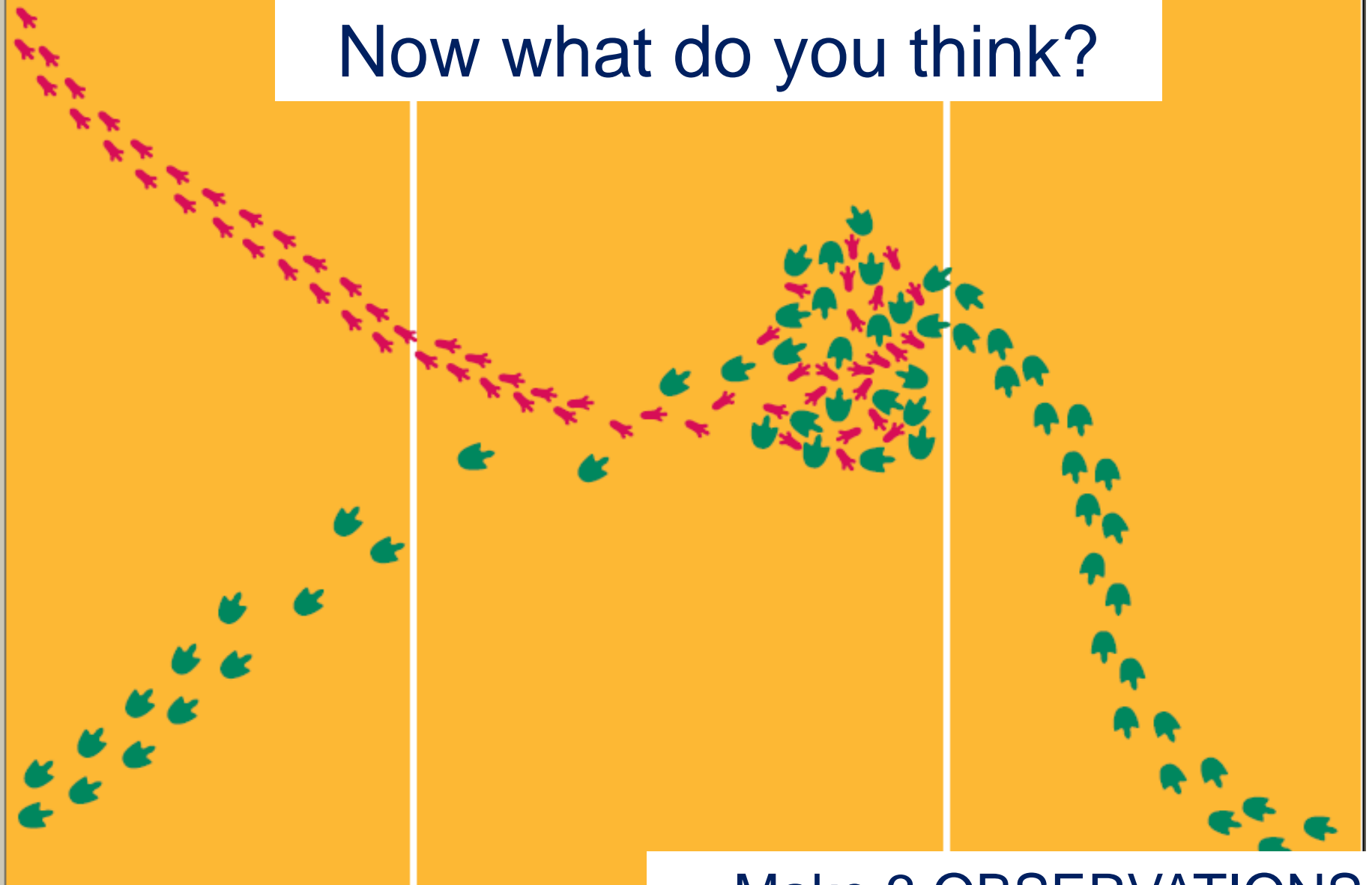
Now what do you think?



Make 3 OBSERVATIONS

Make an INFERENCE

Now what do you think?



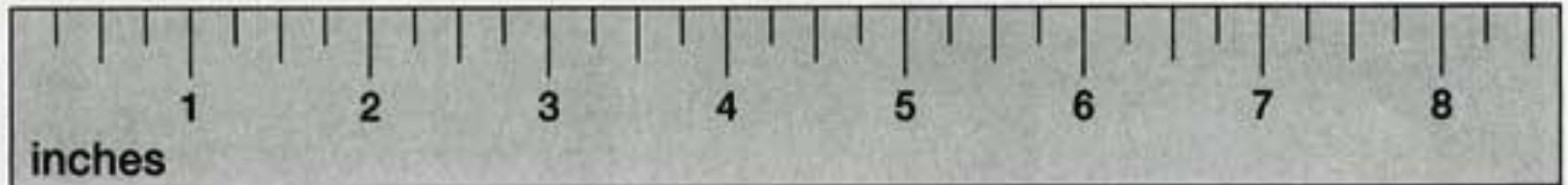
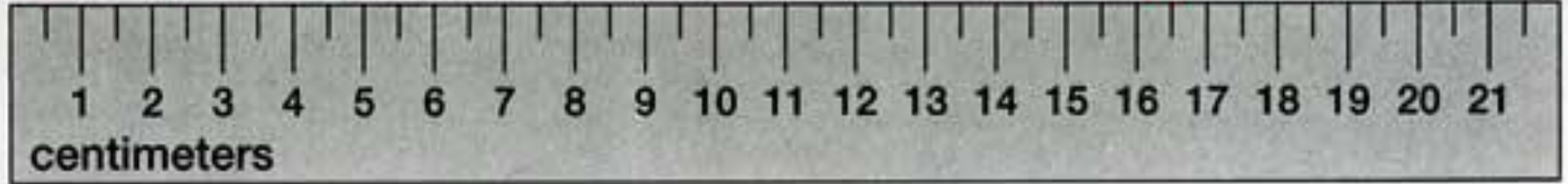
Make 3 OBSERVATIONS
Make an INFERENCE

Practice problems in notes

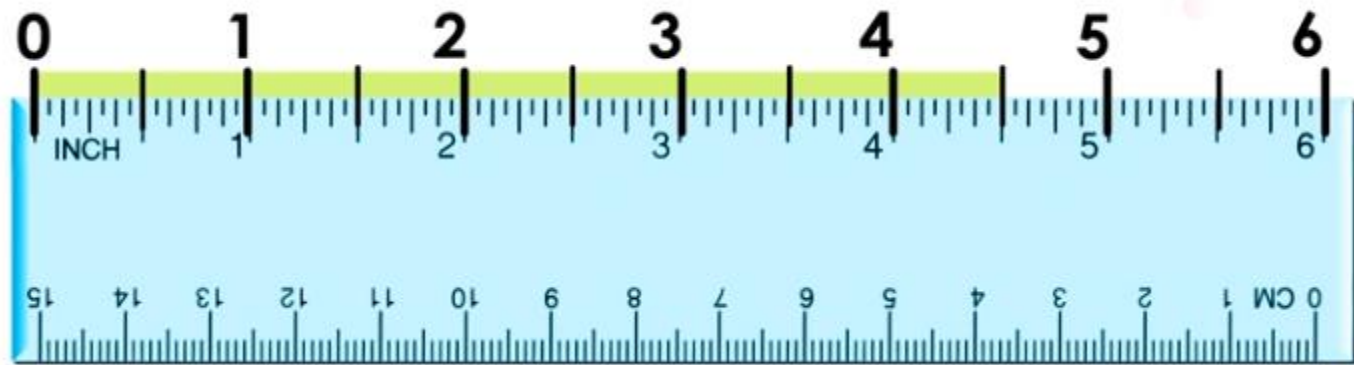
Tools for making observations

- Rulers
- Graduated cylinders
- Triple beam balance
 - Microscopes

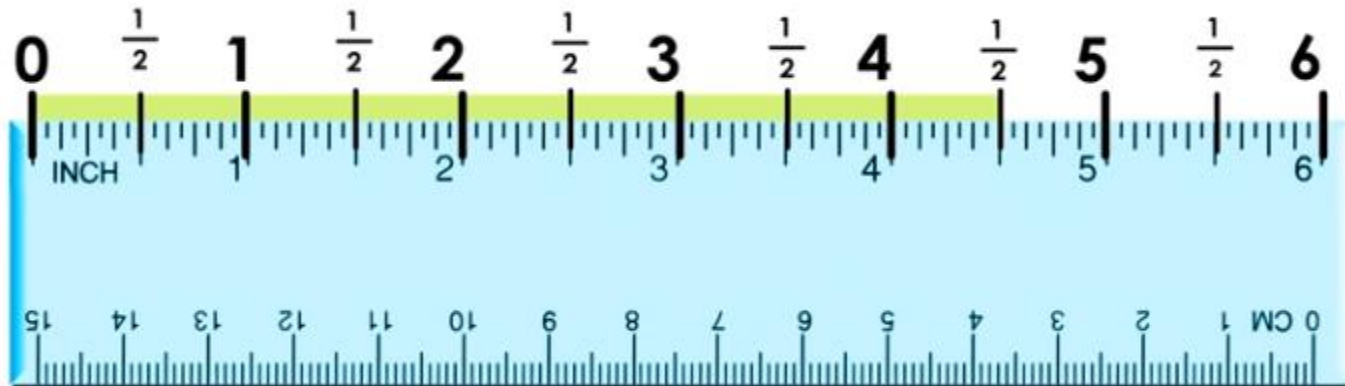
Comparison of Metric versus English rulers

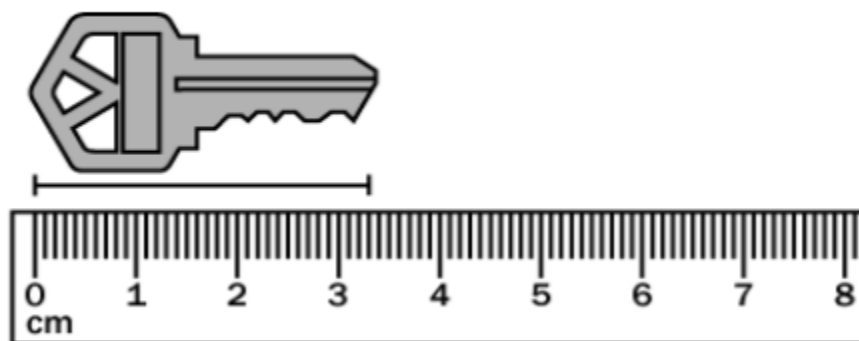


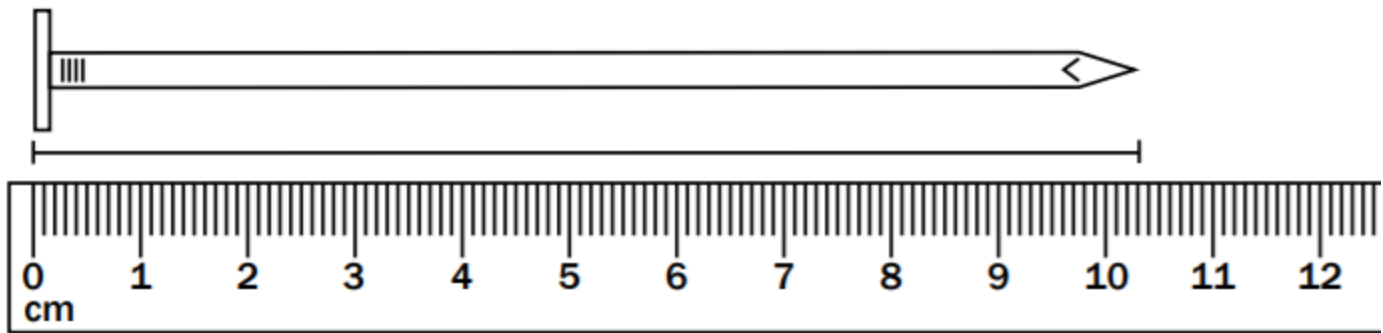
- Centimeters = cm
- Inches = in. = “

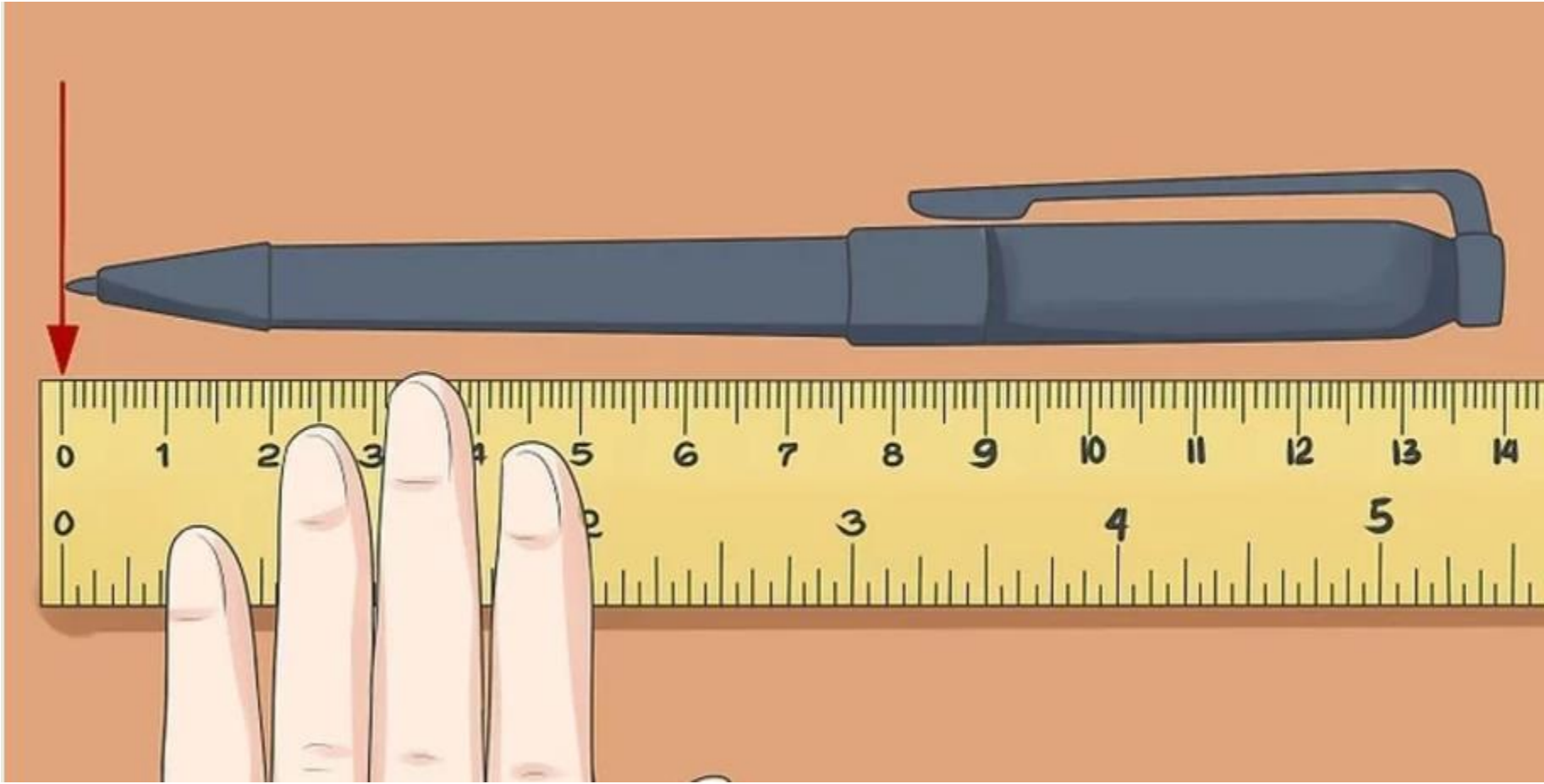


$$4 \frac{1}{2} \text{ " } = 4.5 \text{ " }$$



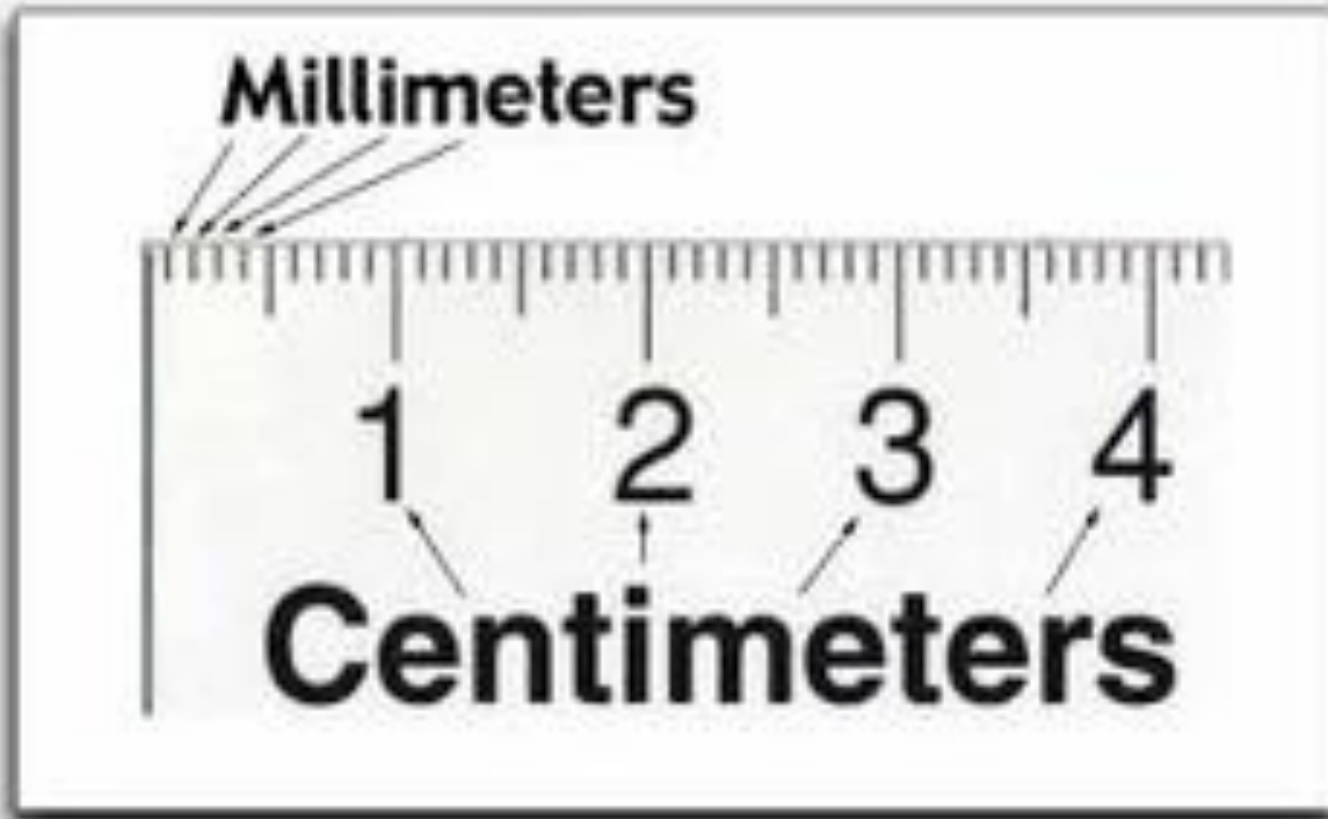








How many mm in a cm?

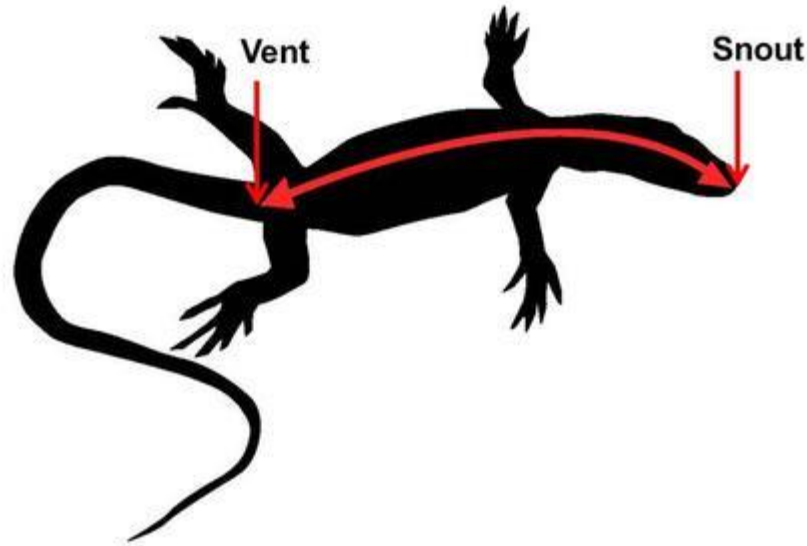




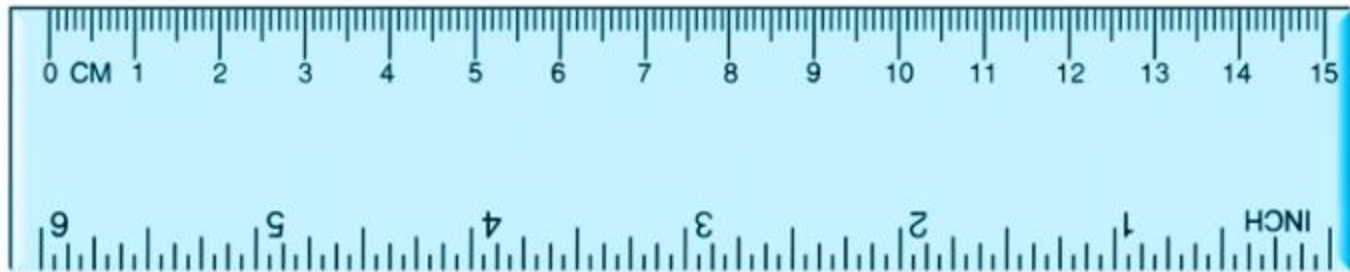
Red backed salamanders



Measuring snout - vent



Record # of inches, centimeters and millimeters of the spotted salamander



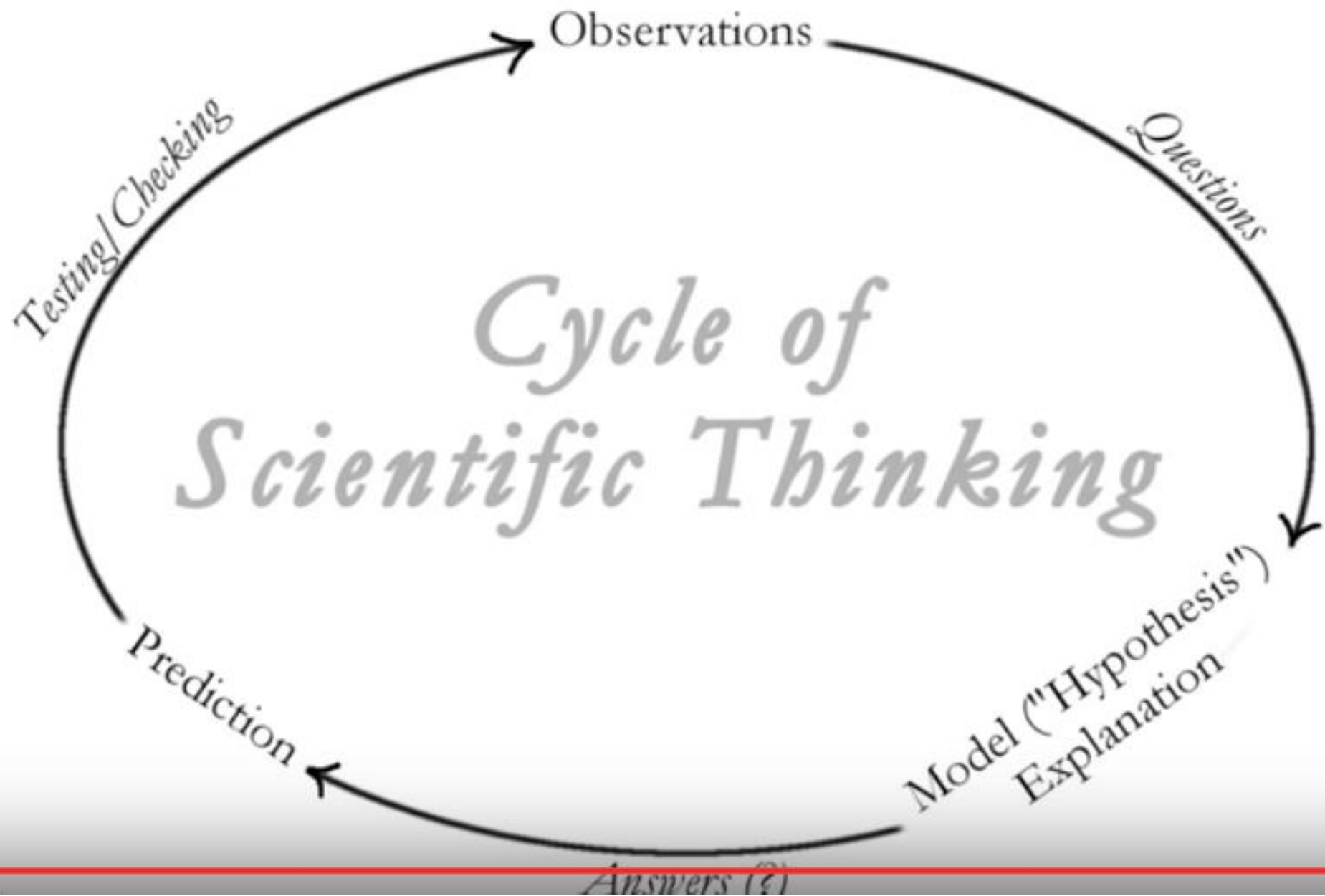
Alligator Lab

Measure your alligators snout to vent



Do measuring practice questions
in notes packet

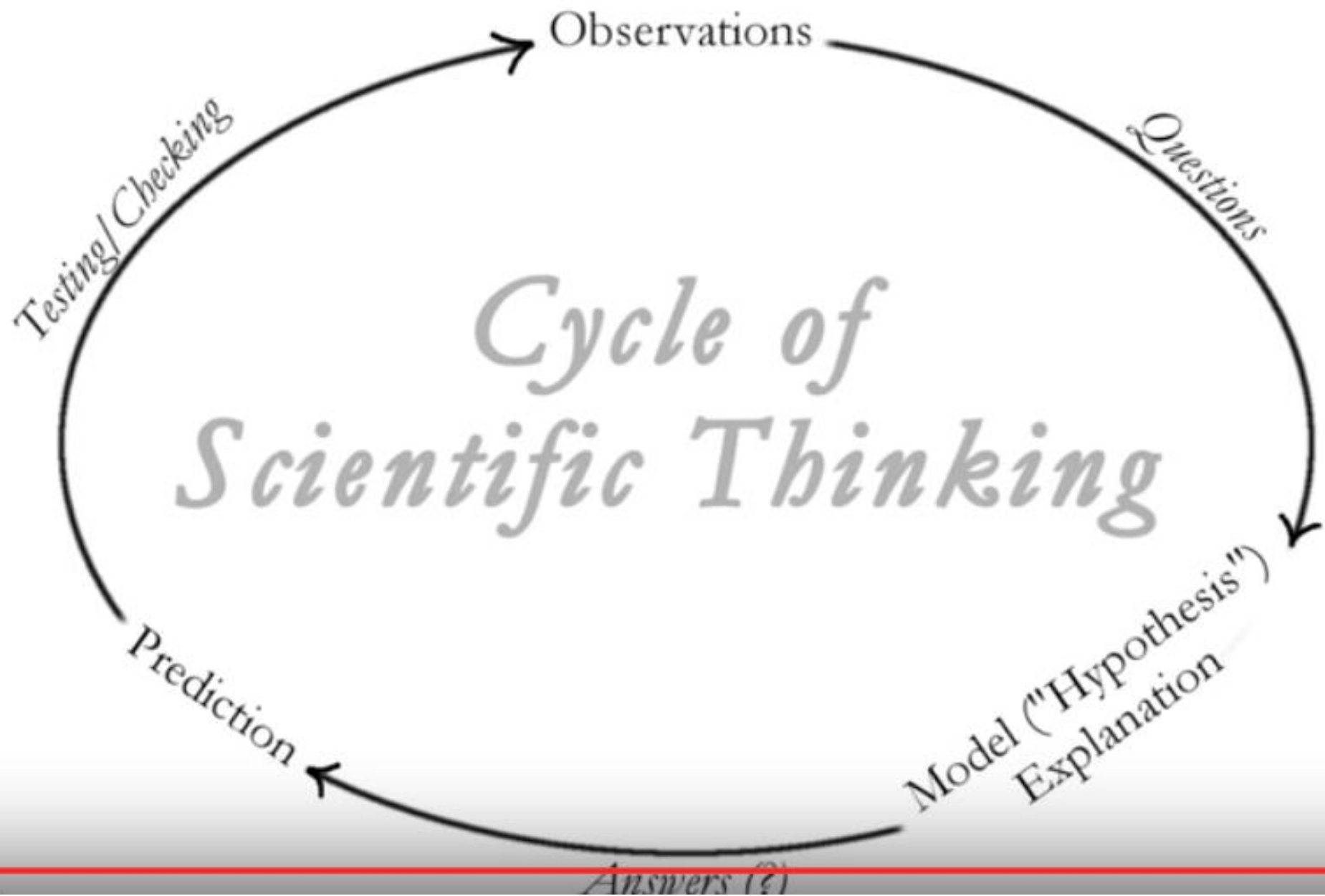
Cycle of Scientific Thinking



Observation → Questions



Cycle of Scientific Thinking

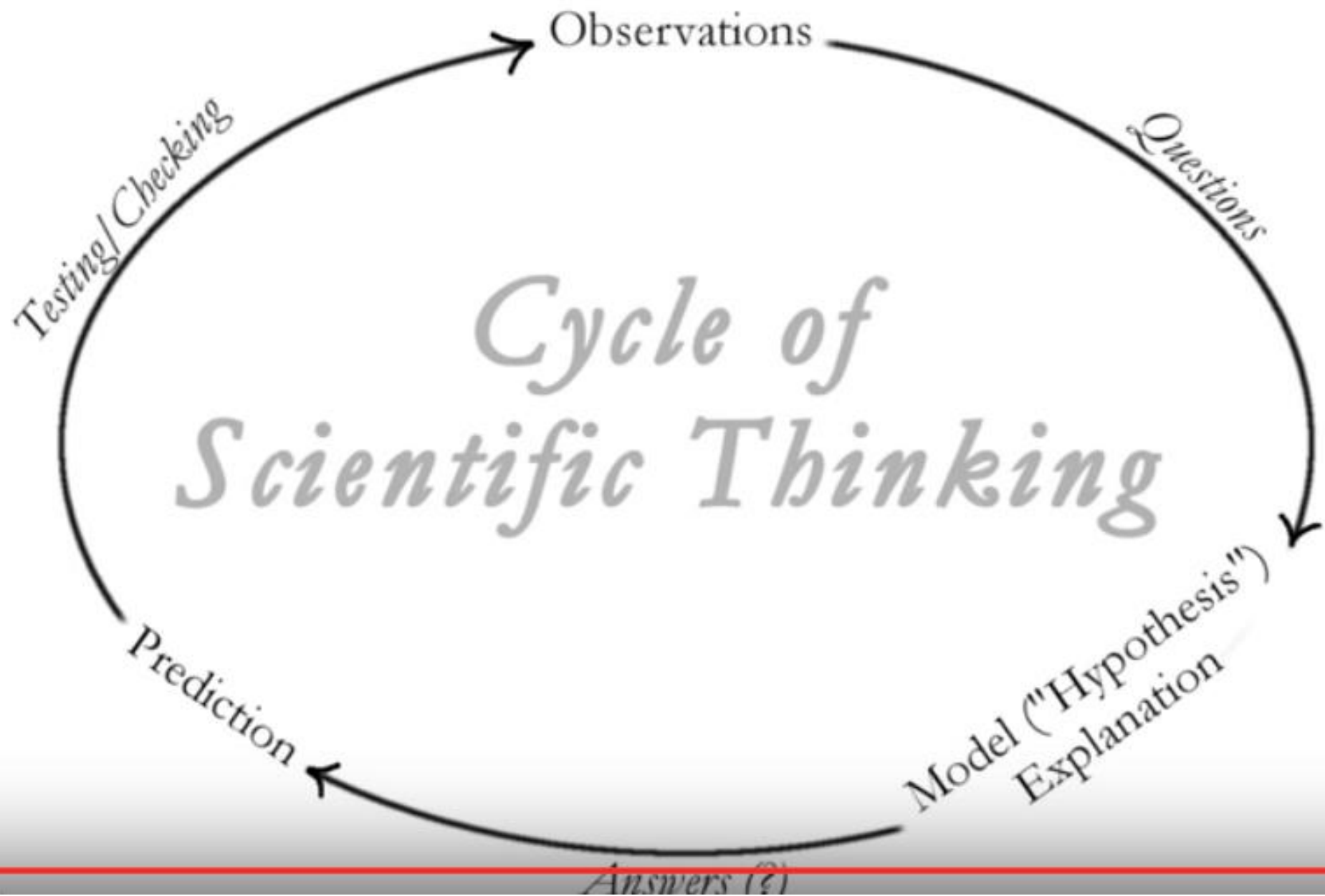


Hypothesis = a statement
explaining an observation

Example:

- This guy is blue because _____

Cycle of Scientific Thinking

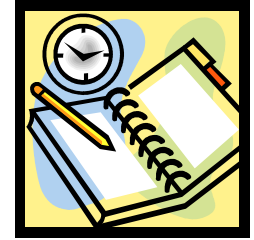


Test your hypothesis with an
experiment

Experimental Design Vocabulary

- Independent variable = thing you are testing (only difference between the groups)
- Control group = Group that does not get the independent variable (needed for comparison)

Vocabulary

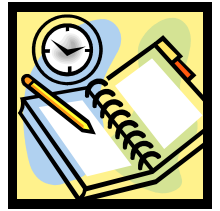


- Dependent variable = Data = the thing you will measure in your experiment
- Hypothesis = statement explaining what you think will happen
 - Ex: If I add ____ then ____ will happen

Title

- The effect of independent on the dependent variable
- The effect of the I on the D

Practice



(Title, independent variable, control group, dependent variable, hypothesis)

- You want to know if caffeine changes your heart rate
- You want to know how much bleach it takes to kill bacteria
- You want to know if blood pressure is affected by height
- You want to know if pH has an effect on seed germination

Things that make experiments better (more reliable) (more accurate)

- Only test one variable at a time (everything must be the same except that one thing)
- Include a control group to use for comparison
- REPEAT, REPEAT, REPEAT with large sample sizes → same results