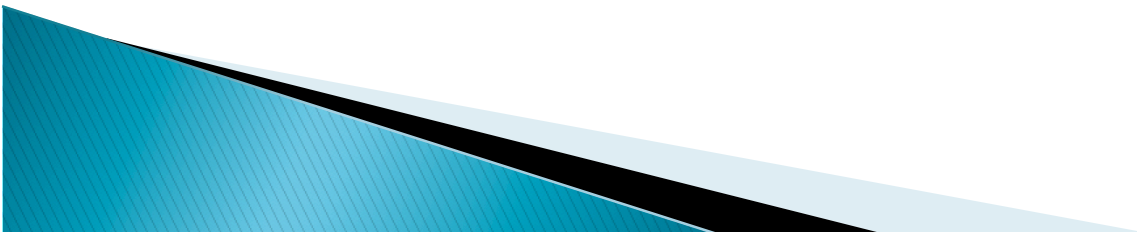


Do Now (5 min)

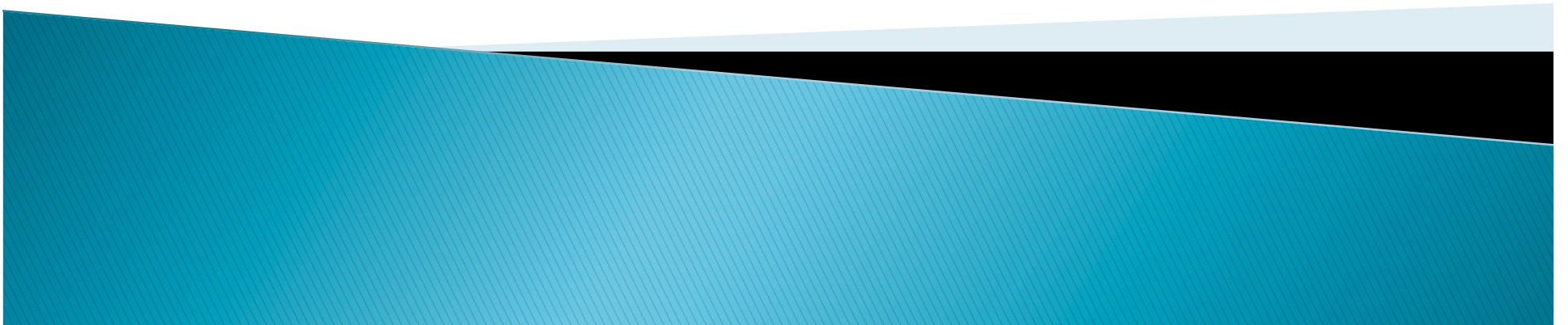
11-30-10

- ▶ Write down the 5-steps of the scientific method.



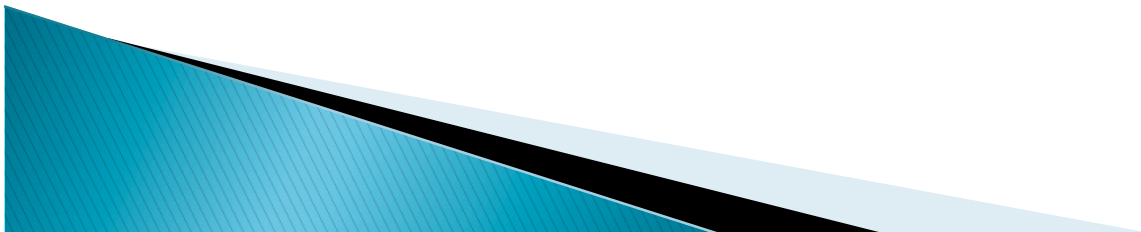
More Details on the Scientific Method: Question and Hypothesis

11-30-10



Agenda

1. Do Now (5 min)
2. Objectives (3 min)
3. Sci. Method: Step #1 Question (10 min)
4. Sci. Method: Step #2 Hypothesis (15 min)
5. Experiment #1 (16 min)
6. Closing/ **HW** (5 min)
7. Exit Slip (5 min)
8. Participation Grades (5 min)



Objectives (3 min)

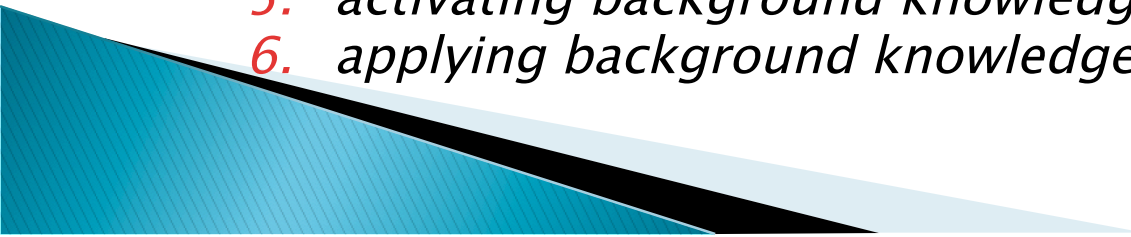
- ▶ Content (The objectives you'll master today)

- ▶ SWBAT:

- 1. List the elements of a scientific question*
- 2. Distinguish between scientific and everyday questions*
- 3. List the elements of a hypothesis*
- 4. Identify a hypothesis*
- 5. Create a scientific question*
- 6. Create a hypothesis in the "if/then" format*

- ▶ Language (How you will master the objectives)

- ▶ By:

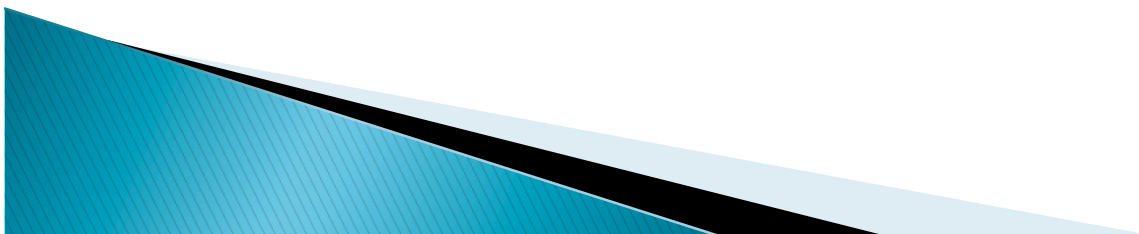
- 1. taking notes on the PowerPoint presentation*
 - 2. applying in-class notes about scientific questions*
 - 3. taking notes on the PowerPoint presentation*
 - 4. applying in-class notes on hypotheses*
 - 5. activating background knowledge about classroom items*
 - 6. applying background knowledge about classroom items*
- 

Sci. Method: Step #1 Question (5 min)

Objective: SWBAT: *List the elements of a scientific question by taking notes on the PowerPoint presentation.*

- ▶ Scientific questions are different than everyday questions.
 - They are based on:
 - Background Knowledge
 - Past Observations
 - Specific curiosities (the answer cannot be obvious)

Every day question	Scientific Question
Does fruit float?	Will a peeled or unpeeled orange float in room temperature water?



Sci. Method: Step #1 Question (5 min)

Objective: SWBAT: *Distinguish between scientific and everyday questions by applying in-class notes about scientific questions*

- ▶ Scientific questions are different than everyday questions.
 - They are based on:
 - Background Knowledge
 - Past Observations
 - Specific curiosities (the answer cannot be obvious)

Scientific or Everyday	Will a water-strider (a bug that walks on fresh water) be able to walk on salt water?
Scientific or Everyday	Will soy beans grown in soil?
Scientific or Everyday	Is water or air a better insulator to use in a coffee mug?
Scientific or Everyday	How do you make beer?

Sci. Method: Step #2 Hypothesis (10 min)

Objective: SWBAT: *List the elements of a hypothesis by taking notes on the PowerPoint presentation.*

▶ A hypothesis is:

- a) An educated guess (based on background knowledge)
- b) A prediction that can be tested
- c) MEASURABLE
- d) Written in “if, then” format
 - “If _____[I do this] _____, then _____[this]_____ will happen.”
- e) Very SPECIFIC
- f) Designed to answer your scientific question (Step #1)

▶ A hypothesis is not:

- a) An observation
 - Ex: (clouds are white)
- b) A scientific fact
 - Hydrogen has one proton
- c) A scientific law (gravity)



Sci. Method: Step #2 Hypothesis (5 min)

Objective: SWBAT: *Identify hypothesis by applying in-class notes on hypotheses*

Is it a hypothesis?		Example Hypothesis
Yes	No	If I open the faucet $\frac{1}{4}$ turn, the faucet will pour $\frac{1}{2}$ gallon per minute
Yes	No	Mr. Schy's classroom is 500 ft ²
Yes	No	If an average adult eats food, he will gain weight.
Yes	No	If I raise the temperature of a cup of coffee I will increase the speed at which the sugar dissolves.
Yes	No	If I give a plant 1-dose of fertilizer each day for 30 days, it will grow 10x faster than a plant without fertilizer.
Yes	No	If there is gravity, then the a pen will fall to the ground when pushed from a table.
Yes	No	If I put mud-guards on a bike, then they will keep the rider dry when riding through puddles.

Experiment #1 (On separate paper) (8 min)

Objective: SWBAT: *Create a scientific question by activating background knowledge about classroom items*

Scientific Method Step

#1: _____

- ▶ Scientific questions are different than everyday questions.
 - They are based on:
 - Background Knowledge
 - Past Observations
 - Specific curiosities (the answer cannot be obvious)

Activate Background Knowledge: What do you know about the items below?

I am going to drop them off the table at the same time...

What are you curious about? Write a scientific question.



Experiment #1 (On separate paper) (8 min)

Objective: SWBAT: *Create a hypothesis in the “if/then” format by applying background knowledge about classroom items*

Scientific Method Step #2:_____

- ▶ A hypothesis is:
 - a) An educated guess (based on background knowledge)
 - b) A prediction that can be tested
 - c) MEASURABLE
 - d) Written in “if, then” format
 - “If _____[I do this] _____, then _____[this]_____ will happen.”
 - e) Very SPECIFIC
 - f) Designed to answer your scientific question (Step #1)

Based on your background knowledge, write a hypothesis about this experiment.

I am going to drop them off the table at the same time...



Closing/**HW** (5 min)

- ▶ Did you master the following objectives?
- ▶ Content (The objectives you'll master today)
- ▶ **SWBAT:**
 - 1. List the elements of a scientific question*
 - 2. Distinguish between scientific and everyday questions*
 - 3. List the elements of a hypothesis*
 - 4. Identify a hypothesis*
 - 5. Create a scientific question*
 - 6. Create a hypothesis in the "if/then" format*
- ▶ Language (How you will master the objectives)
- ▶ **By:**
 - 1. taking notes on the PowerPoint presentation*
 - 2. applying in-class notes about scientific questions*
 - 3. taking notes on the PowerPoint presentation*
 - 4. applying in-class notes on hypotheses*
 - 5. activating background knowledge about classroom items*
 - 6. applying background knowledge about classroom items*

Closing/HW (5 min)

Name _____ Date _____ Block _____

Anatomy and Physiology

11-30-10

Schy

Scientific Method: Question/Hypothesis HW

1. (2 pts) Based on the following information, write a scientific question.

Some brands of batteries last longer than other brands of batteries.

2. (2 pts) Based on your scientific question, write a hypothesis that would answer that question.

3. (3.5 pts) (.5 ea)

Is it a hypothesis?		Example Hypothesis
1. Yes	No	If I open the faucet $\frac{1}{4}$ turn, the faucet will pour $\frac{1}{2}$ gallon per minute
2. Yes	No	Mr. Schy's classroom is 500 ft ²
3. Yes	No	If an average adult eats food, he will gain weight.
4. Yes	No	If I raise the temperature of a cup of coffee I will increase the speed at which the sugar dissolves.
5. Yes	No	If I give a plant 1-dose of fertilizer each day for 30 days, it will grow 10x faster than a plant without fertilizer.
6. Yes	No	If there is gravity, then the pen will fall to the ground when pushed from a table.
7. Yes	No	If I put mud-guards on a bike, then they will keep the rider dry when riding through puddles.

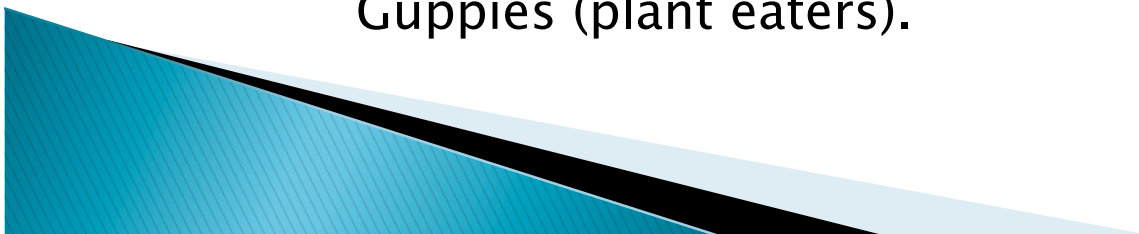
4. What scientific topic would you like to investigate? Write one more scientific question based on your topic of choice.

|

Exit Slip (5 min)

- ▶ On a separate sheet of paper, write your **NAME**, **DATE**, and **BLOCK** at the top. Today is 11-30-10 😊
- ▶ Then number your paper and write responses to the following questions.
 1. List 2 elements of a scientific question
 2. List 2 elements of a hypothesis
 3. Write a hypothesis about what you think will happen if:

Piranhas (meat eating fish) are put in the same tank as Guppies (plant eaters).



Participation Grades (5 min)

- ▶ Each day YOU will decide the grade you deserve...Though, I reserve the right to change these.
- ▶ Your 5-point daily participation grade is based on CLA's core-values:
 - ▶ CLA Students are S.M.A.R.T.
 - ▶ S = Self-Controlled
 - ▶ M = Motivated
 - ▶ A = Accountable
 - ▶ R = Respectful
 - ▶ T = Timely
 - ▶ One point for each core-value
 - ▶ (5 points possible each day)
- ▶ What do you deserve today?

