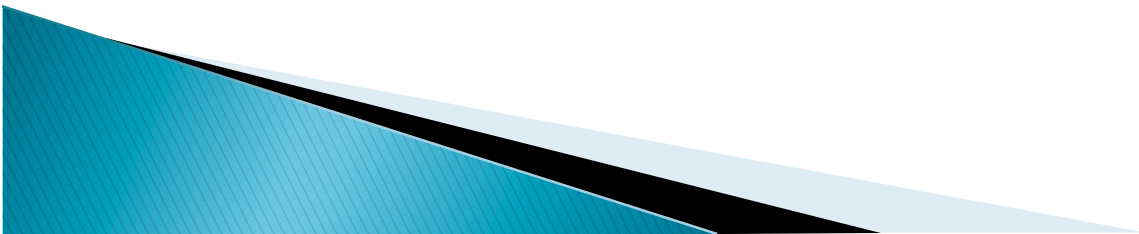


# Do Now (5 min)

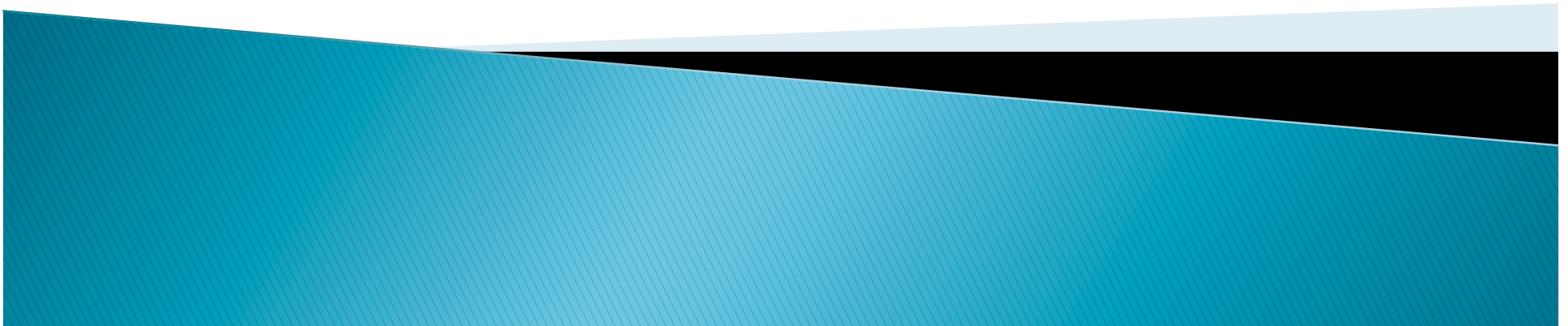
## 12-1-10

- ▶ What is the most important thing a scientist can do to make sure that an experiment is fair?



# More Details on the Scientific Method: Data Collection, Data Analysis

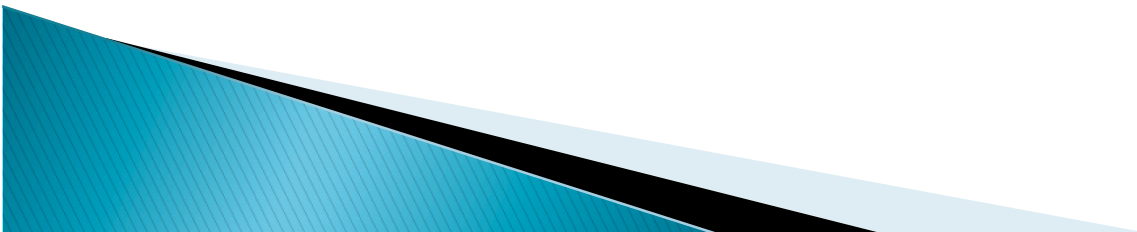
12-2-10



# 12-2-10 Agenda

1. Do Now (5 min)
2. Objectives (3 min)
3. Sci. Method: Step #4 Data Collection (4 min)
4. Sci. Method: Step #5 Data Analysis (5 min)
5. Sci. Method: Step #5 Data Analysis: Methods (4 min)
6. Sci. Method: Step #5 Data Analysis: Graphing (8 min)
7. Sci. Method: Step #5 Data Analysis: Graph Details (8 min)
8. Sci. Method: Step #5 Data Analysis: Choosing the Right Graph (10 min)
9. Sci. Method: Bringing it All Together (30+ min)

(77 min total...only have 61...we may finish tomorrow! ☺)



# Objectives (3 min)

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

- ▶ **SWBAT:**

1. *Explain the purpose of data collection*
2. *List at and provide an example of at least one data collection method*
3. *Define data analysis and explain its purpose*
4. *List at least one method of Data Analysis*
5. *Explain why graphing is often necessary in data analysis*
6. *Explain what can be done with a data table to make it more understandable*
7. *Analyze data and draw a conclusion.*
8. *List the 5 necessary details on every graph*
9. *Determine whether or not to use a bar or line graph*
10. *Design and carry out an experiment*

- ▶ Language (How you will master the objectives)

- ▶ **By:**

1. *taking notes on the PowerPoint*
2. *taking notes on the PowerPoint.*
3. *taking notes on the PowerPoint.*
4. *taking notes on the PowerPoint.*
5. *taking notes on the PowerPoint.*
6. *taking notes on the PowerPoint.*
7. *interpreting a graph*
8. *taking notes on the PowerPoint.*
9. *applying their notes from class*
10. *using their knowledge of the scientific method*

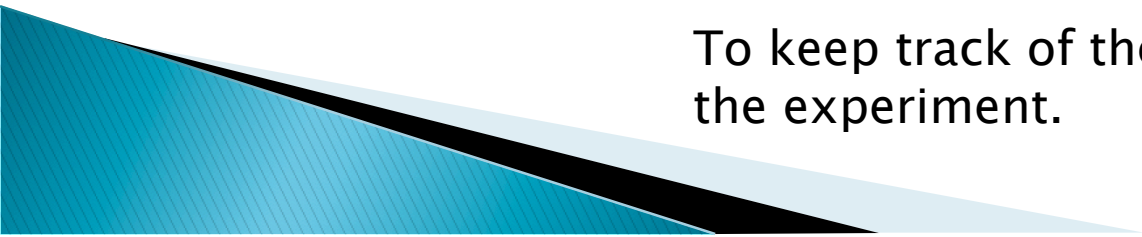
# Sci. Method: Step #4 Data Collection (3 min)

Objective: SWBAT: *Explain the purpose of data collection by taking notes on the PowerPoint presentation.*

- ▶ Step #1: Question (Does weight of an object affect the speed at which it falls?)
- ▶ Step #2: Hypothesis (If I drop a heavy object from a desk, than it will hit the ground faster than a lighter object)
- ▶ Step #3: Experiment
- ▶ Step #4: Data Collection

What is the purpose of collecting data?

To keep track of the information you get from the experiment.



# Sci. Method: Step #4 Data Collection (1 min)

Objective: SWBAT: *List at and provide an example of least one data collection method by taking notes on the PowerPoint.*

- ▶ There are many ways to collect data...
- ▶ The most common way to collect data:
  - Data Table...Below is one example of a data table

Trail #	Which Object Hit First
1	Lighter
2	Heavier
3	Heavier
4	Lighter
5	Heavier
6	Heavier
7	Lighter
8	Lighter

**NOTE:** This data is made up...you will collect your own soon 😊



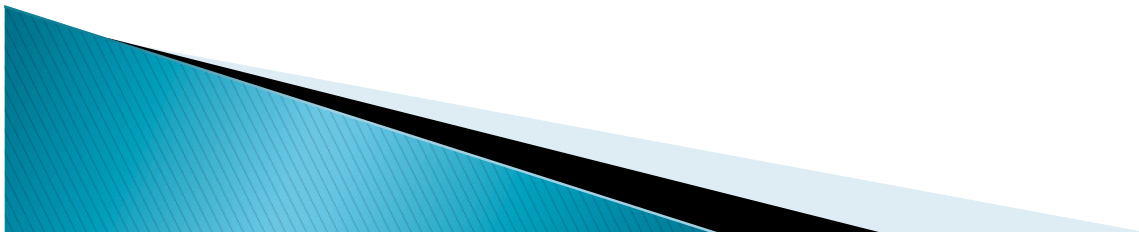
# Sci. Method: Step #5 Data Analysis (5 min)

Objective: SWBAT: *Define data analysis and explain its purpose by taking notes from the PowerPoint*

- **Data Analysis**: an in-depth examination of your data

What is the purpose of data collection?

To determine if your hypothesis is true or false! 😊

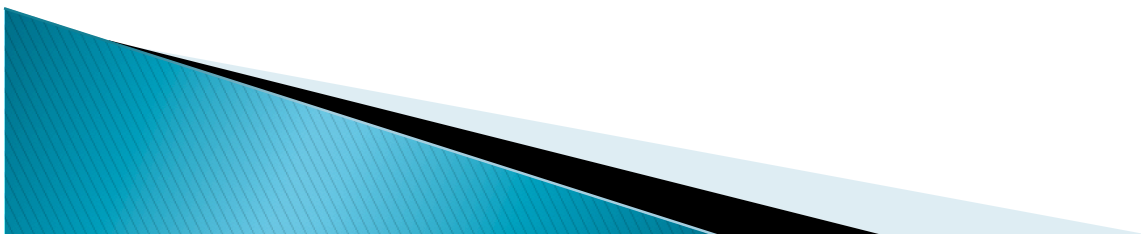


# Sci. Method: Step #5 Data Analysis: Methods (4 min)

Objective: SWBAT: *List at least one method of Data Analysis by taking notes based on the PowerPoint.*

- Data Analysis: an in-depth examination of your data
- (for the purpose of determining if your hypothesis is true or false)
- ▶ There are also many ways to analyze your data:
  - You can do:
    - –Statistical analysis (using statistics to examine your data)
    - –Logical analysis (using logic to examine your data)

In this class...we will use logical analysis



# Sci. Method: Step #5 Data Analysis: Graphing (3 min)

Objective: SWBAT: *Explain why graphing is often necessary in data analysis by taking notes based on the PowerPoint.*

Logical analysis (using logic to examine your data)

Trail #	Which Object Hit First
1	Lighter
2	Heavier
3	Heavier
4	Lighter
5	Heavier
6	Heavier
7	Lighter
8	Lighter

Sometimes, looking at a data table makes it very hard to determine if your hypothesis is true or false...

What could you do to make the information in a data-table more understandable?

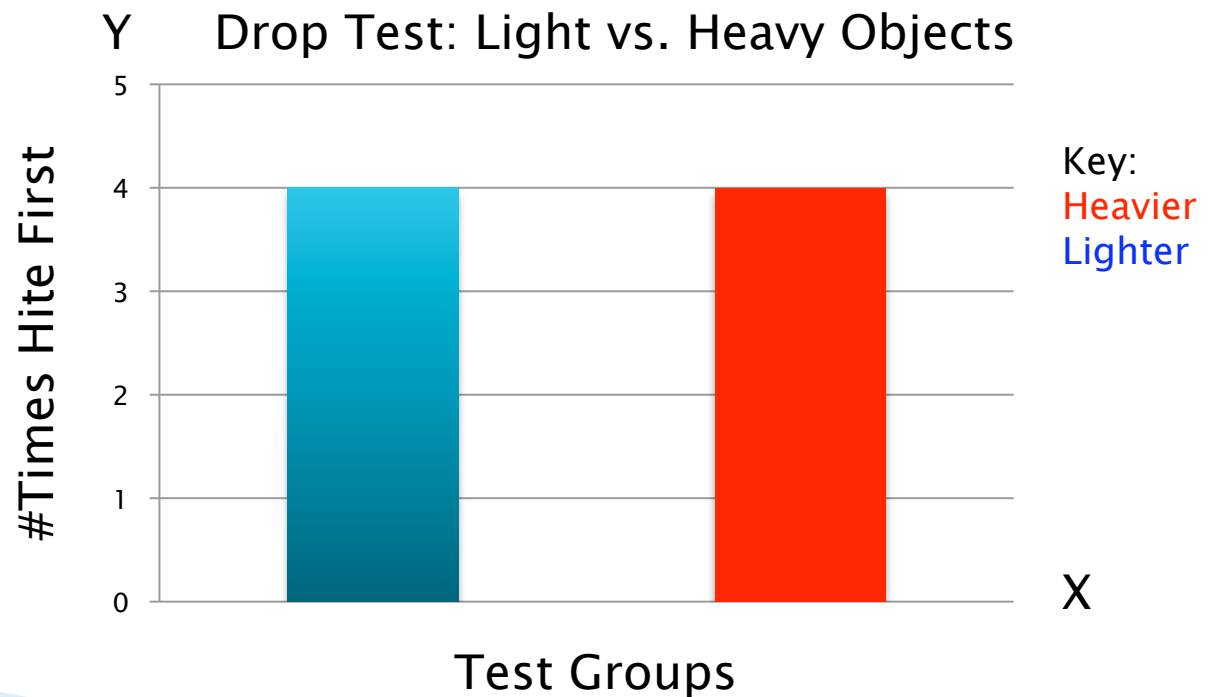


# Sci. Method: Step #5 Data Analysis: Graphing (2 min)

Objective: SWBAT: *Explain what can be done with a data table to make it more understandable by taking notes based on the PowerPoint.*

Trail #	Which Object Hit First
1	Lighter
2	Heavier
3	Heavier
4	Lighter
5	Heavier
6	Heavier
7	Lighter
8	Lighter

What could you do to make the information in a data-table more understandable?...**Graph it!**



# Sci. Method: Step #5 Data Analysis: Conclusions

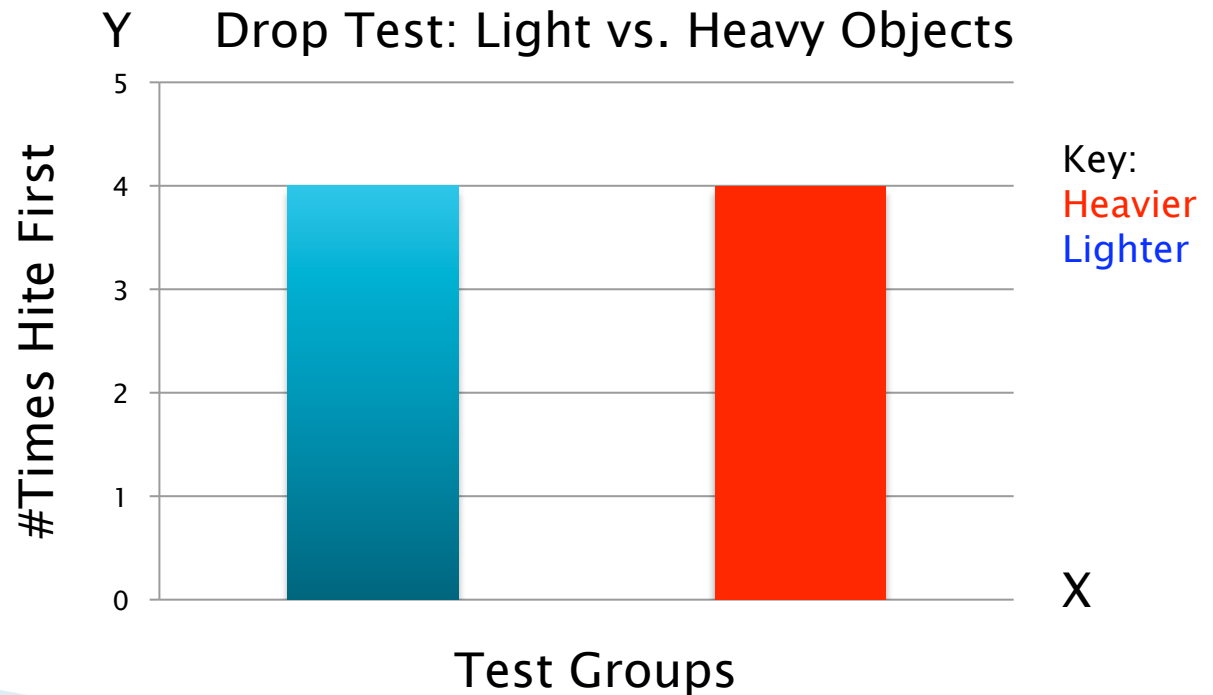
## (3 min)

Objective: SWBAT: *Analyze data and draw a conclusion by interpreting a graph.*

The last part of analyzing (examining) the data is **Drawing a Conclusion!**

So, according your data analysis, is our hypothesis true or false?

Step #2: Hypothesis (If I drop a heavy object from a desk, than it will hit the ground faster than a lighter object)

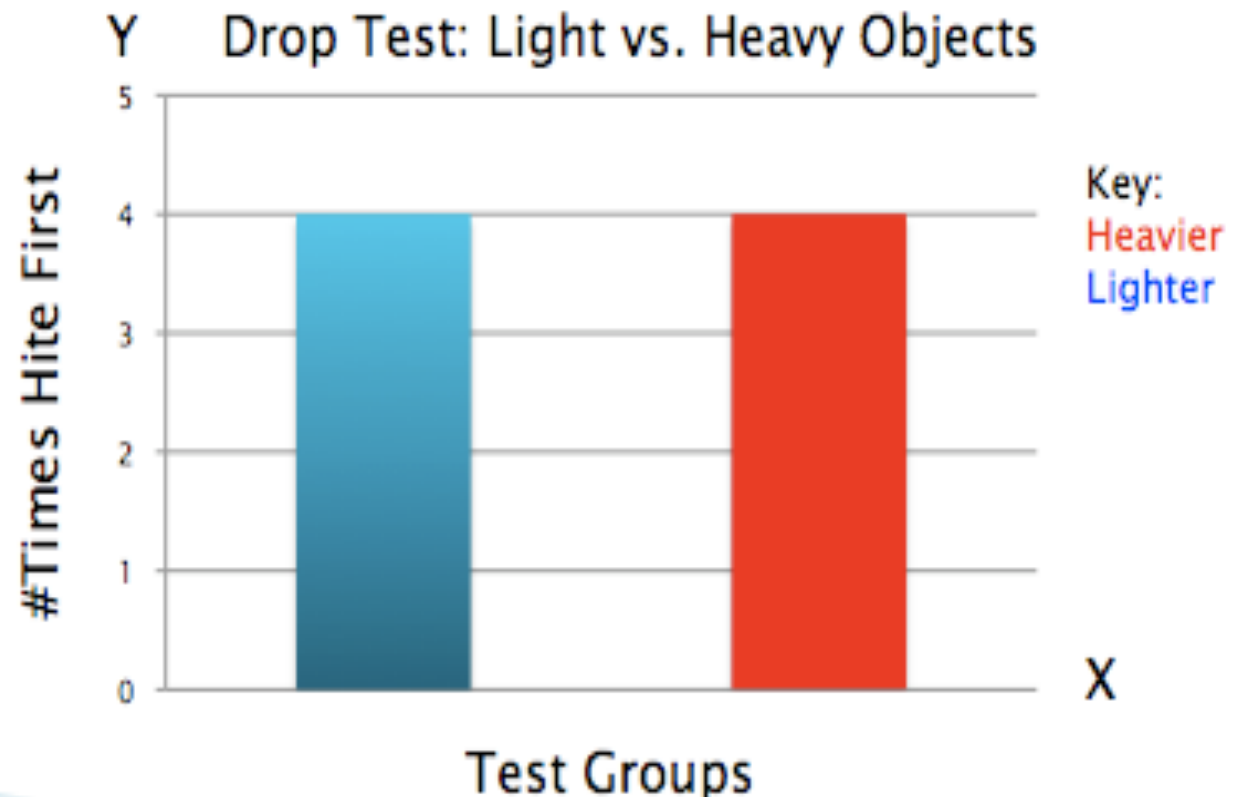


# Sci. Method: Step #5 Data Analysis: Graph Details (8 min)

Objective: SWBAT: *List the 5 necessary details on every graph by taking notes based on the PowerPoint.*

## 5 Necessary Details for All Graphs:

1. Title
2. X/Y Axis
3. Even intervals
4. Axis labels
5. Key



# Sci. Method: Step #5 Data Analysis: Choosing the Right Graph (10 min)

Objective: SWBAT: Determine whether or not to use a bar or line graph *by taking notes based on the PowerPoint.*

Why didn't we use a line graph?

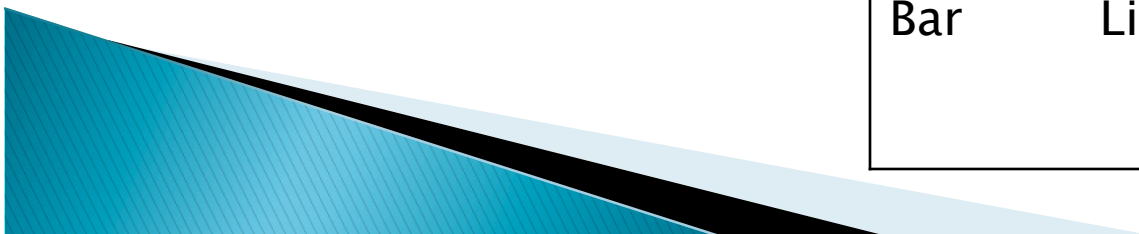
Use a Line Graph when:

–the data relates to time

Use a Bar Graph when:

–the data does not relate to time

Bar	Line	Number of times a light object hits the ground first vs. a heavier object
Bar	Line	Number of cancer cells in a brain from January to March
Bar	Line	Boys and Girls born in 2005
Bar	Line	Amount of CO <sub>2</sub> in the atmosphere from 1990–2000
Bar	Line	Blood alcohol concentration from sober to 3 drinks



## Sci. Method: Bringing it All Together (30+ min)

Objective: SWBAT: *Design and carry out an experiment by using their knowledge of the scientific method.*

You will now use the worksheet to complete your experiment!

Name \_\_\_\_\_ Date \_\_\_\_\_ Block \_\_\_\_\_

Anatomy and Physiology  
Student Experiment  
12-2-10  
Schy

You will now use your knowledge about the scientific method to design and conduct an experiment. I have completed step #1 for you. You will do the rest.

### Step #1: Question

Does the weight of an object affect the speed at which it falls?

**Step #2: Hypothesis:**

### Step #3: Experiment:

Please be very specific, similar to a recipe, when you write your experimental procedures. Remember they should be detailed enough for someone to be able to replicate your experiment!

#### Step #4: Data Collection:

Please use the space below to record your data. You may use a data table or any other organized method to collect your data.

### Step #5: Data Analysis:

In this section you must do two things. First, you must turn the data you collected into a graph. Second, you must write me an explanation of whether or not you proved your hypothesis true and false.

Write your explanation on the lines below.

# Closing/**HW** (5 min)

## ► Did you master the following objectives?

Content (The objectives you'll master today)

SWBAT:

1. *Explain the purpose of data collection*
2. *List at and provide an example of at least one data collection method*
3. *Define data analysis and explain its purpose*
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5. *Explain why graphing is often necessary in data analysis*
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10. *Design and carry out an experiment*

Language (How you will master the objectives)

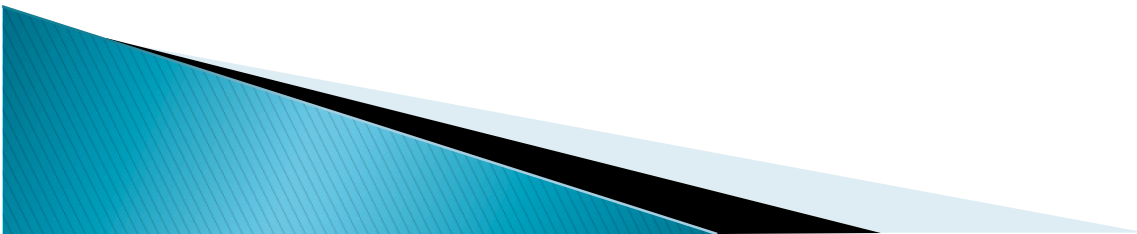
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9. *applying their notes from class*
10. *using their knowledge of the scientific method*

# Exit Slip (5 min)

- ▶ On a separate sheet of paper, write your **NAME, DATE, and BLOCK** at the top.

None today!



# 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?

