Monday, August 15

Special presentation from Mrs. Salisbury
If you didn’t add these to your agenda yesterday, then please do so right now:

Thursday: Directions – hw due Monday
Friday:  Directions – hw due Monday

Hold on to your exit tickets and the warm up paper that I am giving to you.
Exit tickets:
Please hold on to these for now.
If you want to earn more points on an exit ticket then follow these directions:
-On a separate sheet of paper, write down the questions you missed, what the correct answer should be, and explain WHY. Staple your exit ticket to the corrections paper and turn in to the basket behind my desk.

**Corrections need to be done on your own time. Not when we are doing something else in class.**

**All corrections and retakes must be completed within 2 weeks of the day you completed the assignment.**
Warm up – this will be completed on the warm-up paper that I gave to you. Keep that paper in your science folder so that you can find it each day immediately when you come in to class. Please copy the question and then write your own answer.

8/16: How would you define “observation” in your own words? How do you make observations?

Share what you wrote down with the people at your table
How do you do science?

Today we will...
- Record observations and compare qualitative and quantitative observations.

Mission: We will be incredible science students.
Observe the candle demonstration.
Add to your table of contents

<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Page #</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/12</td>
<td>Lab Safety Rules &amp; Agreement</td>
<td>1</td>
</tr>
<tr>
<td>8/16</td>
<td>Observation Notes</td>
<td>2</td>
</tr>
</tbody>
</table>

Tape the notes page on to page 2 in your notebook (this should be the back of the page that has the lab safety agreement)
Observation

• Information gathered using one or more of your senses
• States exactly what you observe (you are not explaining)
• Information gathered from observations is called evidence or data
Let’s see how good our observation skills are…

- https://www.youtube.com/watch?v=1GEEvvTiiQk
- https://www.youtube.com/watch?v=8-hapS2SPz4
Purpose – Practice making observations. We will also use this to explore variables, hypotheses and data tables later.
Instructions –

1. Person D is your supply boss. This person will get and return all materials.

2. You will need: 1 paper, 1 block, piece of string, protractor, washer(s), stopwatch (you may use cell phone)

3. Hang the string from the hook on the block. Attach a washer to the paperclip (please do not take the paperclips off)

4. Pull the washer up (keeping the string straight) and let go so that it swings.

5. Play around with it (you can add more washers, change length of string, etc). Write down observations on the notebook paper (try to get at least 15 observations)
Once the pendulum starts to move, there are names for the aspects of its movement. The size of a swing is called the **amplitude**. The amplitude is measured in degrees—the same degrees that you use to measure angles in geometry. One complete swing back and forth is called a **cycle**. The time it takes for a pendulum to complete one cycle (a complete swing) is called its **period** (meaning the period of time it takes). And just to confuse you, the number of cycles (swings) per second (or per minute) is called the **frequency**.
Safety – Follow rules listed in Safety Agreement. No horseplay (don’t swing these around) and please be careful not to break the rulers.
Pendulum Lab

Questions???

Who is the supply boss for each group?

What are you writing down?

What are some things that you can “change”? 
Once the pendulum starts to move, there are names for the aspects of its movement. The size of a swing is called the \textbf{amplitude}. The amplitude is measured in degrees—the same degrees that you use to measure angles in geometry. One complete swing back and forth is called a \textbf{cycle}. The time it takes for a pendulum to complete one cycle (a complete swing) is called its \textbf{period} (meaning the period of time it takes). And just to confuse you, the number of cycles (swings) per second (or per minute) is called the \textbf{frequency}. 
• Share 2 observations – try to share some that others have not yet shared.
<table>
<thead>
<tr>
<th>Qualitative Observations</th>
<th>Quantitative Observations</th>
</tr>
</thead>
</table>

Examples from pendulum lab:

Examples from pendulum lab:
Qualitative

- Quality
- These are descriptions/data that do not use numbers
- Ex: colors, smells, tastes, sounds, textures
Quantitative

- Quantity
- These are descriptions/data that **do** use numbers (measurements)
- Ex: anything that you can count or measure (size, temperature, speed... )
• Put a **STAR** by all of your **QUALITATIVE** observations.

• Put a **CHECK MARK** by those that are **QUANTITATIVE**.
<table>
<thead>
<tr>
<th>Qualitative Observations</th>
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</tr>
</thead>
<tbody>
<tr>
<td>• Quality</td>
<td>• Quality</td>
</tr>
<tr>
<td>• These are descriptions/data that do NOT use numbers</td>
<td>• These are descriptions/data that DO use numbers</td>
</tr>
<tr>
<td>• Examples: color, smell, taste, sounds, textures</td>
<td>• Examples: anything that you can count or measure (size, temperature, speed)</td>
</tr>
</tbody>
</table>

**Examples from pendulum lab:**

**Examples from pendulum lab:**
What were some QUALITATIVE observation you could make?
What were some QUANTITATIVE measurements you could make?
Warm up:
Please put this on your warm-up paper from yesterday.

Remember, write the date, question and then the answer. If you get it wrong, cross it out and write the correct answer when we talk about it.

8/17 Question: Which type of data do we want to try to collect more of during experiments – qualitative or quantitative? Why?
Warm up:
Please put this on your warm-up paper from yesterday.

Remember, write the date, question and then the answer. If you get it wrong, cross it out and write the correct answer with (corrected).

8/17 Question: Which type of data do we want to try to collect more of during experiments – qualitative or quantitative? Why?

Answer: Quantitative – it gives us more specific information and is less subjective.
Reminder:

-Friday is a ½ Day & spirit day – wear red, white and blue

-Walking to lunch – don’t run, Watch for the smaller kids Walk to the side so they can get by.
How do you do science?

Today we will...
- Identify variables in an experiment and formulate a question and a testable hypothesis

Mission: We will be incredible science students.
Stand up / Sit down Quiz

TRUE = Stand
FALSE = Sit
I play sports
I play sports for a school team
I can play an instrument
I like to listen to music
I am a good singer

TRUE = Stand  FALSE = Sit
I like to have fun
I like to read
I am in a school club
I am a tech genius
I have a super power

TRUE = Stand  FALSE = Sit

Tuesday Wrap Up 3/3
Stand up / Sit down Quiz

Quantitative = Stand

Qualitative = Sit
The pendulum had a frequency of 1.2 swings per second
The pendulum was swinging fast
The mass on the end of the pendulum was heavy

Quantitative = Stand
Qualitative = Sit
It is hot outside

That dog weighs 65 pounds

The cow eats a lot of grass

Quantitative = Stand

Qualitative = Sit
What’s wrong????

- I wanted to see how the length of the string of the pendulum affects the period (amount of time it takes for one complete swing). So, I cut 5 string of different lengths. I then tied washers that were different sizes to each one. I dropped some from a high angle and some from a low angle and timed how long it took for each one to swing back and forth.
Add to your table of contents

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<th>Date</th>
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<tbody>
<tr>
<td>8/17</td>
<td>Variable Notes</td>
<td>3</td>
</tr>
<tr>
<td>8/17</td>
<td>Controlled experiments and hypotheses</td>
<td>4</td>
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</tbody>
</table>
- Fold and cut
- Write labels on the outside
- Tape onto page 3 when done writing
Variables & Controlled Experiments
Variable

• Any factor that can change in an experiment

Ex: What are some factors that might affect plant growth?
Independent Variable

• (Manipulated) The variable that is \textbf{changed} by the scientist. This is what is being \textbf{tested}. We are trying to see how this variable \textbf{affects} something else.

Ex: I want to determine how the amount of sunlight affects plant growth. The amount of sunlight is my manipulated variable.
• (Responding) The variable that **MAY** be affected by the manipulated variable. We are looking to see *if* and *how* this changes.

**Ex:** Since I want to see how sunlight affects plant growth, then plant growth is my responding variable.
Controlled Variables

• These are the variables that are not changed and should remain the same.

• Think about all of the variables that could affect the outcome. Only the independent variable should be changed. All other variables should be kept the same.

Ex: Use same type of plant, same amount of water, same type of soil, same amount of fertilizer, etc.
Operational Definition

• A **statement** that describes how a particular **variable** is going to be **measured**. This tells you what you are looking for in the **dependent** variable.

  Ex: Amount of sunlight = hours of sunlight
  Plant growth = cm per week
Pendulum Variables

What are some variables that we see with these pendulums?
What are some variables that we see with these pendulums?
Pendulum Variables

Pick one variable that you would like to manipulate to test (this is the independent variable).

What will be your dependent variable (what are you measuring)?

What will be your controlled variables (list at least 3)?

Write down operational definitions for each one (length of the string, mass of the washers, period in seconds). We want to collect QUANTITATIVE data.
Once the pendulum starts to move, there are names for the aspects of its movement. The size of a swing is called the **amplitude**. The amplitude is measured in degrees—the same degrees that you use to measure angles in geometry. One complete swing back and forth is called a **cycle**. The time it takes for a pendulum to complete one cycle (a complete swing) is called its **period** (meaning the period of time it takes). And just to confuse you, the number of cycles (swings) per second (or per minute) is called the **frequency**.
**Pendulum Variables**

Examples:

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<th>Independent variable</th>
<th>How is this measured?</th>
<th>Dependent variable</th>
<th>How is this measured?</th>
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## Pendulum Variables

**Examples:**

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Controlled Experiment

• An experiment in which all factors are **identical** except one (the **independent variable**)

• With a controlled experiment, you are testing to see how one variable (the **independent variable**) affects another (the **dependent variable**).
• **Example:** Students of different ages were given the same jigsaw puzzle to put together. They were timed to see how long it took them to complete it.

**Independent variable:**
Age of students

**Dependent variable:**
Time to complete puzzle

**Controlled variables:**
Same puzzle (picture, # of pieces), same time of day, same directions
8/18 The chemist tested to see how the temperature of the water affects the rate sugar dissolves. What is the independent variable?
Warm-up (write the date AND question):

8/18 The chemist tested to see how the temperature of the water affects the rate sugar dissolves. What is the independent variable?

Independent variable (manipulated variable) = temperature of the water
Reminder:

- Friday is a ½ Day & spirit day – wear red, white and blue

- Walking to lunch – don’t run, Watch for the smaller kids Walk to the side so they can get by

6th hour-On Thursdays we need To stack the chairs at the end of class
How do you do science?

Today we will...
- Identify variables in an experiment and formulate a question and a testable hypothesis

**Mission:** We will be incredible science students.
Open to page 4

- Controlled Experiment
- Scientific Question
- Hypothesis
- Experimental Design
How does the **independent** variable affect the **dependent** variable?

Write the scientific question for your pendulum experiment. Look at your variables on page 3 to do that.
Hypothesis

• A **tentative explanation** (think about how you think that the independent variable will affect the dependent variable and why)

• A hypothesis must be **testable**

• Helps you to determine how to **design** your experiment and see what **data** you should collect
Hypothesis

• Written in this format:

If (how will you manipulate the independent variable) then (what do you predict will happen to the dependent variable) because (why do you think that will happen?)
Hypothesis

• Write a hypothesis for your pendulum experiment in this format (If...then...because). Look at what your variables are.

Example: If the length of the string is decreased then the amplitude will decrease because the shorter string won’t swing as high
Experimental Design

• When conducting an experiment, it’s important to do multiple trials. This helps to ensure that the data is valid and reliable and helps to reduce the effects of any experimental error. The data then needs to be averaged.
Experimental Design

• When conducting an experiment, it’s important to do multiple trials. This helps to ensure that the data is valid and reliable and helps to reduce the effects of any experimental error. The data then needs to be averaged.

For your pendulum lab, please conduct at least 3 trials and average your data.
To find the **average**

- Add up all of the numbers and **divide** by how many numbers you are adding together

**Example:**
These were the number of pendulum swings in 1 minute:
75, 85, 80

\[ 75 + 85 + 80 = 240 \]

\[ \frac{240}{3} = 80 \text{ swings/minute} \]
1. Students want to measure if the type of desk you sit in affects your ability to pay attention.

**Independent variable:** Type of desk

**Dependent variable:** Ability to pay attention

**Controlled (list 3):** Same kids, same teacher, same type of activity

**Operational definition (how might you measure the dependent variable?):**

Count how many times they are off-task, Have them complete a task and score it
2. Teacher wants to measure if the number of times homework is not turned in affects science grades.

Independent variable: Number of times homework not turned in
Dependent variable: Science grades
Controlled (list 3): Same class, same tests, same teacher
Operational definition (how might you measure the dependent variable?): The percent for the grades
3. Teachers want to measure if years of schooling affect the salary of business people.

Independent variable: Years of school

Dependent variable: Salary of business people

Controlled (list 3): Types of jobs, same cities, hours worked

Operational definition (how might you measure the dependent variable?): In dollars
4. Students wanted to study if the hours of sleep teachers get affect their level of patience with students.

Independent variable: Hours of sleep a teacher gets
Dependent variable: Patience
Controlled (list 3): Same students, same time of day, same activity types
Operational definition (how might you measure the dependent variable?): Number of times teacher writes up a student, tells a student to stop doing something
Pendulum Procedure Assignment

Now that you have identified your independent and dependent variables and written your question and hypothesis, it is time to design a controlled experiment that will allow you to gather data to test your hypothesis. Remember, you want to collect quantitative data.

Your assignment is to write your experimental procedure out with step-by-step directions. The directions should be clear, state what the operational definitions are (what will you measure or record?), should not use pronouns (don’t use the words “you” or “I”), and there should be 4 data points and at least 3 trials of each. For instance, if you are testing to see how the length of the string affects the frequency, then you would test 4 different lengths of string. For each length, you would count how many cycles there were in 1 minute 3 times for each length and then average those numbers. Also, include any controlled variables that you will need to account for (for example, how many washers will you use if that is a control and at what angle will you release the pendulum from?).

Make sure to include 4 data points.

This means if you are manipulating the length of the string then you use 4 different lengths. If you are manipulating number of washers, then you do it with 4 different amounts.

You will do 3 trials for each one (so you will test each length of string 3 times or each number of washers 3 times).

These should be written on a piece of notebook paper. Not in science notebook.
• Homework: directions assignment is due on Monday - you are NOT doing experiment at home.

• SLO test – this is just a pre-test and not for a grade. Don’t stress. Just answer as best as you can. No worries 😊
Friday, August 19

½ Day

8th Grade Team Building Activities