7^{th} & 8^{th} grade Notes

Week 2

C-notes

What is Science?

- **Science tries to ANSWER questions using inferences, observation, measurements and data**
- **Science looks for EVIDENCE to find out the "truth"**
- ***science cannot prove negative questions or statements**
- **Example: There are NO fairies….**

What is observation?

It is looking with the brain…

- **Noticing changes**
- **Noticing appearance**
- **Noticing similarities**
- **Connecting with what you know**
- **Creating questions**

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What is observation?

Two types of observations:

- **<u>Quantitative observations-</u> observations that involve numbers or measurement.**
- **Example:**

The snake is 10 feet long, 3 inches in diameter

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What is observation?

Two types of observations:

- **<u>Qualitative observations-</u> observations of a quality, like color, smell, texture, taste.**
- **Example:**

The sugar in the bowl is white and tastes sweet

Assignment: Apple Observation 9.08.14

You and your partner were given an apple, write two qualitative observations about that apple and three quantitative observations in your notebook

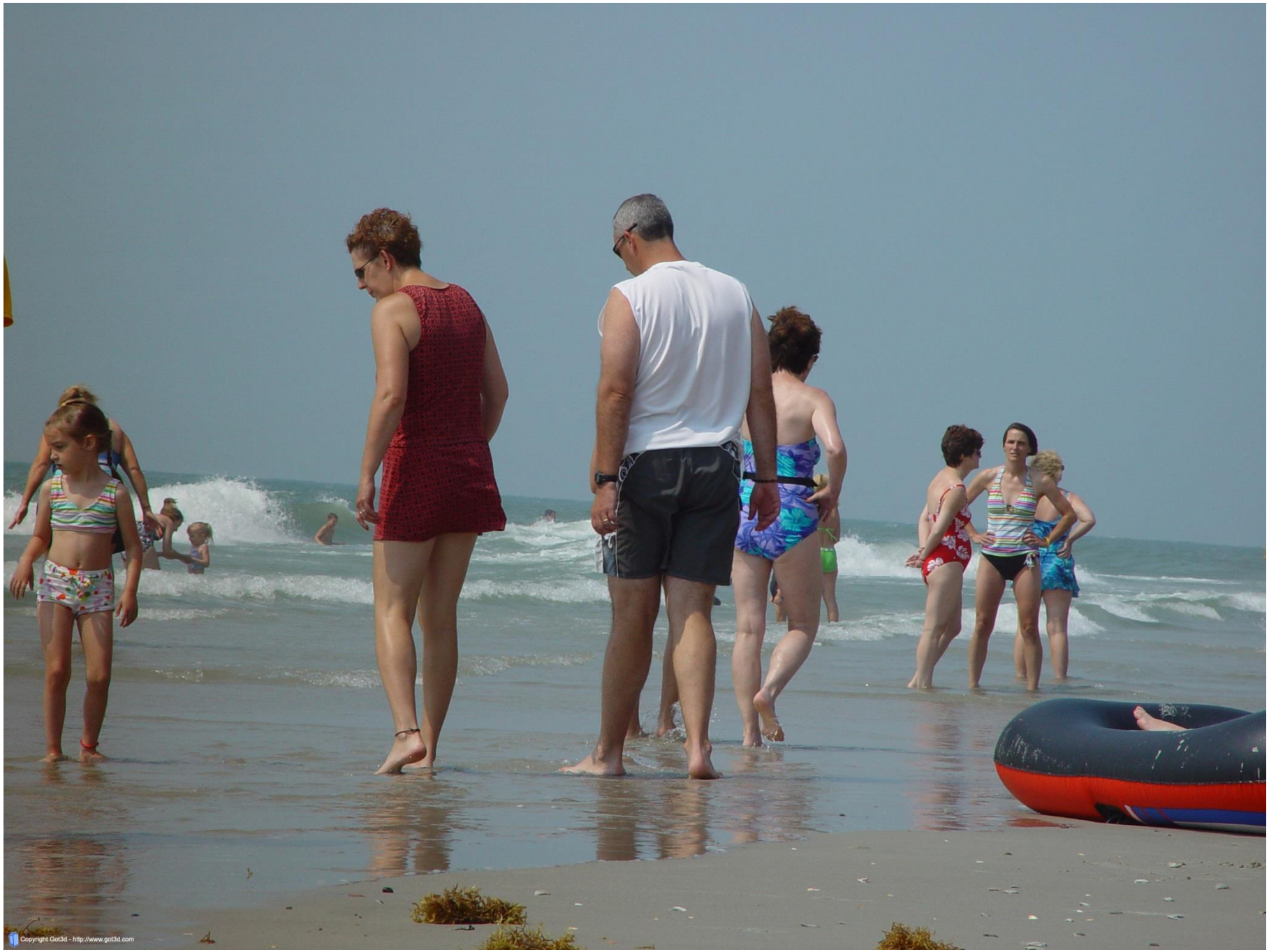
Qualitative Observations

Quantitative Observations

You write the RED parts in your notebook

What is an inference?

Inference- is an attempt to explain or interpret observations or to identify the cause of what was observed.



C-notes

What are Anchor Questions?

- **AQ tell you what we are learning for the week**
- **You must answer and know the answers to the AQ by Friday**
- **AQ are due on FRIDAY!!!!**
- **The assessment for the week comes from the AQ**

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What are Anchor Questions?

- **Should be glued or taped in the notebook**
- **The answers are written on the page that it is on and the page after**

Identifying Variables- a variable is something that might affect the "experiment" …lets see some examples. Let's say you want to find out the answer to the question:

Does the amount of sleep affect school grades?

a)Make a list of what could affect school grades?

b)For this question what would you change in the experiment?

c)For this question what effect would you measure in the experiment?

d)For this question what would you keep the same (constant) in the experiment?

Variables in an experiment

A variable, in an experiment, is something that can change or affect what happens in an experiment.

For the experiment to be valid (or count) there can only be one thing changed- the thing you are testing for.

C-notes

Variables in an experiment

Types of variables:

<u>Constants</u>: the variables that you must keep the same for an experiment to be fair and valid.

<u>Dependent variables</u>: the effect that is being measured in the experiment

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Variables in an experiment

<u>Independent variable</u>: also known as the manipulated variable because it is what YOU control or change in the experiment. THERE CAN ONLY BE ONE INDEPENDENT VARIABLE IN AN EXPERIMENT.

Identifying Variables- a variable is something that might affect the "experiment" …lets see some examples. Let's say you want to find out the answer to the question:

Does watering with coffee help a plant grow more?

a) Make a list of what could affect plant growth

b)For this question what would you change in the experiment?

c)For this question what effect would you measure in the experiment?

d)For this question what would you keep the same (constant) in the experiment?

Organization Tips for Students

1. GOALS. Set realistic goals at the beginning of the school year, and break those large goals into mini-goals. Write these goals down on index cards and keep them in a highly visible place where you can see them every day. Writing down your goals makes them more concrete, and motivates you to keep working towards them
2. DON'T RUSH. Wake up early enough for school to arrive well ahead of time. If you need 30 minutes to get up, shower and dress, pad that time by waking up at least 45 minutes prior to your departure. To ensure you don't turn off your alarm clock and go back to sleep, place your clock at the far end of your room. This way, you actually have to get out of bed to turn it off, and you're most likely to stay up
3. PREPARE YOUR WARDROBE. Before you go to bed each night, choose, iron and lay out your clothes for the next day. This way, you'll be all set to dress and go in the morning.
4. AVOID CLUTTER. At the beginning of the school year, you have no clutter. Be careful not to build clutter as the year progresses. Create separate folders for school announcements, tests that have been graded, papers you must give to your parents and so on. As papers become outdated, such as an event that has passed, toss them immediately.
5. MAKE TO DO LISTS. Always spend a minimum of 15 minutes per day, preparing your To Do list for tomorrow. In doing so, you will know exactly what tasks you have to accomplish the next day.

6. EFFECTIVE STUDY AREA. Designate a quiet, well-lit area for studying. Don't study in front of the television, or in an area of your home where you're bound to be distracted. Hang a Do Not Disturb sign on your door. If you can't find a quiet spot at home, go to the library. In addition, you should study while sitting at a table or desk. Avoid studying in a very comfortable chair or a bed, which may cause you to feel drowsy.
7. GET YOUR BEAUTY SLEEP. Get a good night's rest. This will ensure you are alert and ready to learn the following day.
8. USE A STUDENT PLANNER. Use a good student planner or organizer. The ones that have pocket folders, dividers and planning calendars are ideal.
9. USE ONE CALENDAR. Use one calendar to plan all of your school and personal activities, rather than two or more. When you use more than one, you run the risk of scheduling conflicts and missed appointments. This is very important. Heed the old proverb, A man who wears two watches, never knows the correct time.
10. COLOR-CODE. You may consider color-coding similar activities on your calendar. For example, highlight all upcoming tests in yellow, study time in green and recreational activities in pink.
11. WRITE IT DOWN. When you learn of an upcoming test, event, or anything you must prepare for or attend, immediately jot it in your planner. Don't wait for later, or you may forget about it.

12. BREAK UP YOUR STUDY TIME. Determine how many study hours you need, and schedule study time in your planner. For example, if you need six hours of time to study for a test, you may break that time up into six sessions, of one hour each. Choose the six days, and make a Study Time notation in your calendar.
13. SCHEDULE CONSISTENT STUDY TIMES. Set aside time every day for study, and make it consistent. For example, set your study time for each afternoon from 4:00pm to 6:00pm. Whatever you do, avoid last minute studying and cramming
14. BREAK IT UP. Break up big tasks, into smaller, bite-sized jobs. For instance, if you have to study three chapters in your history book, study one chapter at a time each day. If you have to work on a project, break it down into three or four stages.
15. EAT YOUR BROCCOLI FIRST. Imagine eating your dessert before your brocolli. What would be left for you to look forward to? Just the same, do your homework for your most difficult subjects first. Then, everything else will be a breeze, and therefore, more enjoyable

Basic Steps of the Scientific method

1. Question
2. Hypothesis
3. Procedure
4. Data
5. Conclusion

1. Question (Purpose or Problem): What you want to find out.
2. Hypothesis: What you believe the answer to the question is.
3. Procedure: The steps that you take to find out if your hypothesis is correct. This step also includes the MATERIALS you would need to perform the procedure
4. Data (and observations): Measurements, numbers, observations from the procedure
5. Conclusion: The answer to the original question now that the procedure has been done. In this step you also think about "what happened" and "why" (inference). This step may create more questions for further research.

Vocabulary Words Week 2

Word Bank

variable	Question	Dependent Variable	Quantitative Observation	Qualitative Observation
Control	Hypothesis	Trials	Independent Variable	Inference
Constant				

1. - _____the part of the experiment controlled or changed by the experimenter

2. - _____the part of the experiment that changes because of the independent variable, you observe or measure this part to collect data

3. - _____part of the experiment that remains the same throughout to prevent affecting the outcome

4. - _____standard of comparison, in the "natural" state

5. - _____educated guess or prediction

6. - _____use words to describe something's appearance such as color or texture

7. - _____use numbers to describe information about an object such as mass, length, or volume.

8. - _____is an attempt to explain or interpret observations or to identify the cause of what was observed.

9. - _____you are trying to answer this with your experiment

10. - _____ in science means that you repeat a part of an experiment over and over again in order to come as close as possible to the most accurate results.

11- _____ any factor that can affect the answer to the scientific question.

Vocabulary Words

1. **Independent Variable**- the part of the experiment controlled or changed by the experimenter
2. **Dependent Variable**- the part of the experiment that changes because of the independent variable, you observe or measure this part to collect data
3. **Constant**- part of the experiment that remains the same throughout to prevent affecting the outcome
4. **Control**- standard of comparison, in the "natural" state
5. **Hypothesis**- educated guess or prediction
6. **Qualitative Observation**- use words to describe something's appearance such as color or texture
7. **Quantitative Observation**- use numbers to describe information about an object such as mass, length, or volume.
8. **Inference**- is an attempt to explain or interpret observations or to identify the cause of what was observed.
9. **Question**- you are trying to answer this with your experiment
10. – **Trials** in science means that you repeat a part of an experiment over and over again in order to come as close as possible to the most accurate results.
11- **Variable** any factor that can affect the answer to the scientific question.

8th Anchor Questions Week 2 (Sept. 8-12)
Questions Due: Friday, Sept. 12 Assessment date: Friday, Sept. 12

1. Design an experiment to answer: Do the new "Air Jumpers" shoes make people jump higher? Identify the va
2. Explain what "oranges don't take naps" stands for
3. List the basic steps of the scientific method
4. Explain what a "control" is in an experiment and why it is used
5. Explain two methods that you use to be organized with your schoolwork
6. SKILL: lab design; identifying dependent and independent variables
7. REVIEW: all Week 1 notes (routines, procedures, expectations)

Vocabulary

Data	**Hypothesis**	**Procedure**	**Manipulated (independent) variables**
control	**Explain**	**Question/problem**	**Dependent variables**
inference	**control**	**Scientific method**	**Qualitative observation/data**
constant	**Trials**	**Conclusion**	**Quantitative observation/data**

7th Anchor Questions Week 2 (Sept. 8-12)
Questions Due: Friday, Sept. 12 Assessment date: Friday, Sept. 12

1. Design an experiment to answer: Does the new "Skinny Pill" make people lose weight? Identify the variables
2. Explain what "oranges don't take naps" stands for
3. List the basic steps of the scientific method
4. Explain what a "control" is in an experiment and why it is used
5. Explain two methods that you use to be organized with your schoolwork
6. SKILL: lab design; identifying dependent and independent variables
7. REVIEW: all Week 1 notes (routines, procedures, expectations)

Vocabulary

Data	**Hypothesis**	**Procedure**	**Manipulated (independent) variables**
control	**Explain**	**Question/problem**	**Dependent variables**
inference	**control**	**Scientific method**	**Qualitative observation/data**
constant	**Trials**	**Conclusion**	**Quantitative observation/data**

- Oranges
- Don’t
- Take
- Naps

- ORDER
- DATES
- TITLE
- NEAT

Identifying Variables Worksheet

Instructions: For the following experiments, *identify and describe* the (IV) independent variable, (DV) dependent variable, (CG) control group, and (Con) the constant.

1) Different rose bushes are grown in a greenhouse for two months. The number of flowers on each bush is counted at the end of an experiment.

IV_____

DV_____

Con_____

2) You water three sunflower plants with salt water. Each plant receives a different concentration of salt solutions. A fourth plant receives regular water. After a two-week period, the height is measured.

IV_____

DV_____

CG_____

3) Three wax palm trees are kept at different humidity levels inside of a greenhouse for 12 weeks. One tree is left outside in normal conditions. Height of the tree is measured once a week.

IV_____

DV_____

CG _____

3) Three wax palm trees are kept at different humidity levels inside of a greenhouse for 12 weeks. One tree is left outside in normal conditions. Height of the tree is measured once a week.

IV _____

DV _____

CG _____

Con _____

4) One tank of goldfish is fed the normal amount of food once a day, a second tank is fed twice a day, and a third tank four times a day during a six week study. The fish's body fat is recorded daily.

IV Amount of food

DV Body fat

CG The fish getting normal amount

Con Type of food, fish tank

5) Strawberry plant clones are given different amounts of water for a 3-week period. First strawberry plant receives 400 millilitres (ml) a day. The second strawberry plant receives 200ml a day. The third strawberry plant receives 100ml a day. The fourth strawberry plant does not receive any extra water; this plant only receives natural ways of receiving water. The height of the strawberry plants is recorded daily.

IV Amount of water

DV-Height of plant

Answer Key

1 - Patty Power

Which people are in the control group? *Group B*

What is the independent variable? *New sauce*

What is the dependent variable? *Amount of gas*

What should Mr. Krabs' conclusion be? *The new sauce appears to work as it reduced the amount of gas produced in 60% of the people tested.*

Why do you think 10 people in group B reported feeling better? *They thought they were getting the new sauce as a result thought that they didn't have as much gas. (Placebo effect)*

2 – Slimotosis

What was the initial observation? *Slimotosis on Gary's shell*

What is the independent variable? *Cures (Seaweed and Dr. Kelp)*

What is the dependent variable? *Slime and odor*

What should Sponge Bob's conclusion be? *Although Gary's symptoms have disappeared, it is not known which cure was the one that worked. He should redo the experiment and include a control group as well as two other testing groups for each of the proposed cures.*