Marion High School
Student Instructional Packet Assignments
September 8th - September 21st

Student: _____ Period: _____ Teacher(s): Circle your teacher's name, if more than one teacher is listed below. Teacher 1: Hanna Chestnut Email: hchestnut@marion.k12.sc.us Teacher 2: Habibunnisa B Shaik Email: hshaik@marion.k12.sc.us Course: __Physical Science _____ Teacher Planning Period: _____ **School Number: 843-423-2571**	**Student:** **Please put your name and class period on this sheet.** **You will need to return this sheet and any assignments attached.** **Circle your teacher's name**
	Tuesday – September 8th Introduction classroom rules and expectations Rules and Procedures Lab Safety rules and Symbols
Wednesday – September 9th Lab safety rules and symbols, Flinn's Safety contract Practice	Thursday – September 10th Interactive learning activity Lab safety Lab equipment Practice

South Carolina End-of-Course Examination Program

Physical Science Equation Reference Sheet for 2005 Academic Standards

Density

$D = \frac{m}{V}$ D = density $\left(\frac{g}{cm^3}\right)$ m = mass (gram, g) V = volume (cm^3)

Motion and Force

$v = \frac{d}{t}$ v = average speed or velocity $\left(\frac{m}{s}\right)$ d = distance (meter, m) t = time (second, s)

$a = \frac{\Delta v}{\Delta t} = \frac{v_f - v_i}{t}$ a = acceleration v = velocity t = time f = final i = initial

$F_w = ma_g$ $(w = mg)$ F_w or w = force of weight (newton, N)

m = mass (kilogram, kg) a_g or g = gravitational acceleration ($9.8 \frac{m}{s^2}$ or m/s/s)

$F = ma$ F = force (newton, N) m = mass (kilogram, kg) a = acceleration $\left(\frac{m}{s^2}\right.$ or $\left.m/s/s\right)$

Electricity

$V = IR$ V = potential (volt, V) I = current (ampere, A) R = resistance (ohm, Ω)

Work

$W = Fd$ W = work (joule, J) F = force (newton, N) d = distance (meter, m)

Waves

$v = f\lambda$ v = speed $\left(\frac{m}{s}\right)$ f = frequency (hertz, Hz) λ = wavelength (meter, m)

$v = \frac{d}{t}$ v = speed $\left(\frac{m}{s}\right)$ d = distance (meter, m) t = time (second, s)

Syllabus 2020-2021

Marion County School District

Instructor: Ms. Hanna Chestnut, BS

Main School Phone: 843-423-2571, Extension 3638

Courses Taught: CP Physical Science

Email: hchestnut@marion.k12.sc.us

Planning: 3rd block 12:10- 1:40 pm

2020-2021 schedule

1st block- 8:10-9:40 am

2nd block- 9:45-11:15 am

Lunch- 11:15-12:05 pm

3rd block- 12:10-1:40 pm

4th block- 1:45-3:15

Dear Students and Parents/Guardians,

I hope 2020-21 is going to be a wonderful school year!

Supply List:

- 3-ring binder with paper
- Pencils
- Ruler
- Colored pencils
- Highlighters
- Glue stick
- Scissors

Integration of the Curriculum:

I. Math: graphs, metric system, quantitative data.
II. ELA: lab reports, journal articles, reflection journals, writing.
III. Technology: Web quests, computer research, powerpoint, Microsoft word, virtual labs.
IV. Arts: making science models, drawing/labeling scientific diagrams, concept maps, graphic organizers and models.

CHEATING: If found cheating on Tests /Quizzes, copying from others tests, asking for answers, looking up in the book **YOUR TEST WILL BE CANCELLED AND YOU WILL BE AWARDED A ZERO.**

Rules for Online Class

- All classes will be recorded.
- Camera must be turned on for attendance and turned off as instructed.
- All students should have their device on mute until instructed to turn on.
- Attendance will be taken randomly to ensure that you are present for duration of the class, and to get credit for the class.
- Students can be removed from the virtual platform for unacceptable behavior
  - Teachers are requesting students to think responsibly and act respectfully while participating with their peers in the virtual classroom.
  - Our Schoolwide PBIS rules to "Expect Respect" remain in effect while at home.
  - Students who fail to follow the rules as outlined below can possibly be removed from the virtual classroom
- If you have a question please use the raise your hand icon or post it in the chat box.
- If you having technical difficulties please let your teacher know by email or any other instrument for communication (Remind, Class Tag).
- Tardy: virtual platforms records the time you log in/out.
- No Grooming/eating in front of camera.
- No profanity using virtual platforms.
- The same disciplinary actions will be handled the same as if you were in person inside the school.

Basic Rules:

- Identify a suitable workspace to work
- Log or dial in 5 minutes before the virtual classroom session begins
- Be respectful
- Listen actively
- Actively participate
- Complete and submit assignments
- Dress appropriately or turn off video feature

Student Responsibilities:

- Log in daily or assigned meeting times
- Ask/Answer questions
- Take turns participating daily in classroom discussions
- Complete packets and turn in work on time
- Work independently or in groups (when assigned)
- Be an active member of the virtual community

Unacceptable Behavior:

FLINN SCIENTIFIC

Student Safety Contract

School Name _____ **Teacher** _____

PURPOSE

Science is a hands-on laboratory class. You will be doing many laboratory activities which require the use of hazardous chemicals. Safety in the science classroom is the #1 priority for students, teachers, and parents. To ensure a safe science classroom, a list of rules has been developed and provided to you in this student safety contract. These rules must be followed at all times. Two copies of the contract are provided. One copy must be signed by both you and a parent or guardian before you can participate in the laboratory. The second copy is to be kept in your science notebook as a constant reminder of the safety rules.

GENERAL RULES

1. Conduct yourself in a responsible manner at all times in the laboratory.
2. Follow all written and verbal instructions carefully. If you do not understand a direction or part of a procedure, ask the instructor before proceeding.
3. Never work alone. No student may work in the laboratory without an instructor present.
4. When first entering a science room, do not touch any equipment, chemicals, or other materials in the laboratory area until you are instructed to do so.
5. Do not eat food, drink beverages, or chew gum in the laboratory. Do not use laboratory glassware as containers for food or beverages.
6. Perform only those experiments authorized by the instructor. Never do anything in the laboratory that is not called for in the laboratory procedures or by your instructor. Carefully follow all instructions, both written and oral. Unauthorized experiments are prohibited.
7. Be prepared for your work in the laboratory. Read all procedures thoroughly before entering the laboratory.
8. Never fool around in the laboratory. Horseplay, practical jokes, and pranks are dangerous and prohibited.
9. Observe good housekeeping practices. Work areas should be kept clean and tidy at all times. Bring only your laboratory instructions, worksheets, and/or reports to the work area. Other materials (books, purses, backpacks, etc.) should be stored in the classroom area.
10. Keep aisles clear. Push your chair under the desk when not in use.
11. Know the locations and operating procedures, where appropriate, for all safety equipment including first aid kit, eyewash station, safety shower, fire extinguisher, and fire blanket. Know where the fire alarm and exits are located.
12. Always work in a well-ventilated area. Use the fume hood when working with volatile substances or poisonous vapors. Never place your head into the fume hood.
13. Be alert and proceed with caution at all times in the laboratory. Notify the instructor immediately of any unsafe conditions you observe.
14. Dispose of all chemical waste properly. Never mix chemicals in sink drains. Sinks are to be used only for water and those solutions designated by the instructor. Solid chemicals, metals, matches, filter paper, and all other insoluble materials are to be disposed of in the proper waste containers, not in the sink. Check the label of all waste containers twice before adding your chemical waste to the container.
15. Labels and equipment instructions must be read carefully before use. Set up and use the prescribed apparatus as directed in the laboratory instructions or by your instructor.
16. Keep hands away from face, eyes, mouth and body while using chemicals or preserved specimens. Wash your hands with soap and water after performing all experiments. Clean all work surfaces and apparatus at the end of the experiment. Return all equipment clean and in working order to the proper storage area.
17. Experiments must be personally monitored at all times. You will be assigned a laboratory station at which to work. Do not wander around the room, distract other students, or interfere with the laboratory experiments of others.
18. Students are never permitted in the science storage rooms or preparation areas unless given specific permission by their instructor.
19. Know what to do if there is a fire drill during a laboratory period; containers must be closed, gas valves turned off, fume hoods turned off, and any electrical equipment turned off.
20. Handle all living organisms used in a laboratory activity in a humane manner. Preserved biological materials are to be treated with respect and disposed of properly.
21. When using knives and other sharp instruments, always carry with tips and points pointing down and away. Always cut away from your body. Never try to catch falling sharp instruments. Grasp sharp instruments only by the handles.
22. If you have a medical condition (e.g., allergies, pregnancy, etc.), check with your physician prior to working in lab.

CLOTHING

23. Any time chemicals, heat, or glassware are used, students will wear laboratory goggles. There will be no exceptions to this rule!
24. Contact lenses may be worn provided adequate face and eye protection is provided by specially marked, non-vented safety goggles. The instructor should know which students are wearing contact lenses in the event of eye exposure to hazardous chemicals.
25. Dress properly for lab activities. Long hair, dangling jewelry, and loose or baggy clothing are hazardous. Long hair must be tied back and dangling jewelry and loose or baggy clothing must be secured. Shoes must completely cover the foot. No sandals allowed.
26. Lab aprons have been provided for your use and should be worn during laboratory activities.

ACCIDENTS AND INJURIES

27. Report any accident (spill, breakage, etc.) or injury (cut, burn, etc.) to the instructor immediately, no matter how trivial it may appear.
28. If you or your lab partner are hurt, immediately yell out "Code one, Code one" to get the instructor's attention.
29. If a chemical splashes in your eye(s) or on your skin, immediately flush with running water from the eyewash station or safety shower for at least 20 minutes. Notify the instructor immediately.
30. When mercury thermometers are broken, mercury must not be touched. Notify the instructor immediately.

HANDLING CHEMICALS

31. All chemicals in the laboratory are to be considered dangerous. Do not touch, taste, or smell any chemicals unless specifically instructed to do so. The proper technique for wafting chemical vapors will be demonstrated to you.
32. Check the label on chemical bottles twice before removing any of the contents. Take only as much chemical as you need.

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Safety Rules

- 1. Be alert and responsible at all times in the laboratory.
- Follow all written and verbal instructions carefully. If you do not understand a direction or part of a procedure, ASK BEFORE PROCEEDING WITH THE ACTIVITY.
- 3. Never work alone in the laboratory. No student may work in the Lab without the presence of the teacher.

Safety Rules Continued...

- When first entering the lab, do not touch any equipment, chemicals, or other materials in the laboratory area until you are instructed to do so.
- Perform only those experiments authorized by your teacher. Carefully follow all instructions, both written and oral.
- Do not eat food, drink beverages, or chew gum in the laboratory. Do not use laboratory glassware as containers for food or beverages.

Safety Rules Continued...

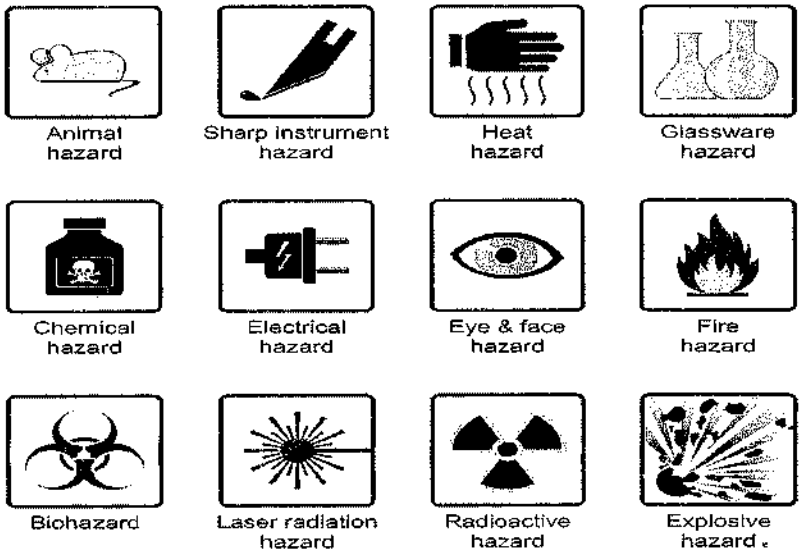
- No Horseplay in the laboratory.
- Always work in a well-ventilated area.
- Work areas should be kept clean and tidy at all times.
- Notify the teacher immediately of any unsafe conditions you observe.

Safety Rules Continued...

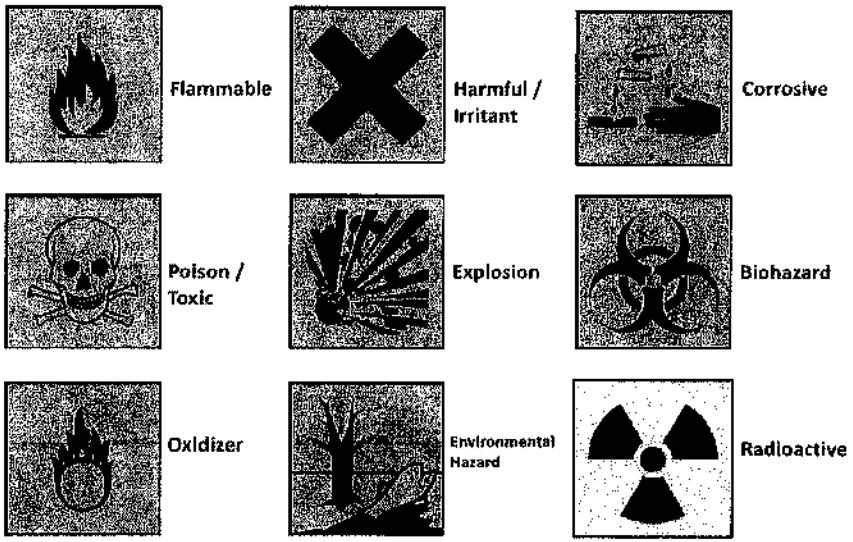
- If you do not understand how to use a piece of equipment, ASK THE TEACHER FOR HELP!

- Do not immerse hot glassware in cold water. The glassware may shatter.

We want to avoid this.



SAFETY PRACTICES



Assignment

- You will develop a safety poster, that illustrates the ten safety rules you feel are broken the most. Here is an example:

Rubric :
Virtual -
Accuracy of 10 Rules -10 points
All 12 slides and on time-5 points
Creativity -5 points

Packets :
Accuracy of 10 Rules -10 points
Legible and on time-5 points
Creativity -5 points

Name _____ Date _____ Section _____

Safety in the Science Classroom

Safety Symbols

Directions: Match the safety symbol to the appropriate description. Each symbol is used only once.

A.  B.  C.  D.  E.  F. 

1. _____ Should be used to protect your eyes
2. _____ Dispose of all materials properly.
3. _____ Poison. Do not inhale or get on your skin.
4. _____ Should be used to protect your clothing.
5. _____ Wash your hands thoroughly when finished.
6. _____ Treat <u>all</u> live animals with respect and handle them with care.

Safe or Unsafe?

Directions: Check off whether a behavior in the lab or science classroom is safe or unsafe.

Behavior	Safe	Unsafe
7. Wearing plastic gloves when dissecting squid.		
8. A student picking up pieces of broken glassware.		
9. Wafting an odor gently towards your nose.		
10. Using an oven mitt to pick up a hot beaker.		
11. Dumping your experiment down the sink when finished.		
12. Using hand sanitizer after a lab instead of washing your hands.		

Look up "Accident at Jefferson High" on youtube and watch!

1.2 – Accident at Jefferson High

Directions: Watch this video http://www.youtube.com/watch?v=PxyDImUYo14&safe=active and answer the questions below on lab safety.

1. List at least 5 types of hazards that can be found in a chemistry lab.

2. What does it mean to come to lab "prepared to do lab work"?

3. What should you always make sure you double check about the chemicals you use?

4. According to the video, what is the best thing to use for cleaning up an acid spill?

5. How do you clean up a base spill?

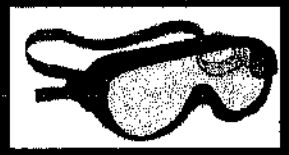
6. Where should you dispose of chemicals at the end of the lab?

7. When can you put chemicals down the sink?

Name_____Date_____

Lab Safety

1. List 3 unsafe activities showsn in the illustration and explain why each is unsafe.
2. List 3 correct lab procedures depicted in the illustration.
3. What should Bob do after the accident?
4. What should Sue have done to avoid an accident?
5. What are three things shown in the lab that should not be there?
6. Compare Joe and Carl's lab techiques. Who is doing it the correct way?
7. What will happen to Ray and Tim when the teacher catches them?
8. What is Betty doing wrong?



Lab Safety

General Safety Rules

1. Listen to or read instructions carefully before attempting to do anything.
2. Wear safety goggles to protect your eyes from chemicals, heated materials, or things that might be able to shatter.
3. Notify your teacher if any spills or accidents occur.

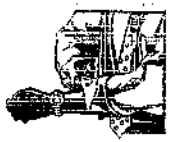
General Safety Rules

4. After handling chemicals, always wash your hands with soap and water.

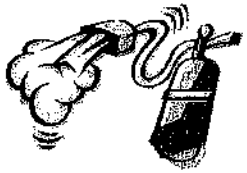
5. During lab work, keep your hands away from your face.
6. Tie back long hair.

General Safety Rules

7. Roll up loose sleeves.

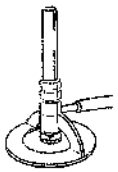


8. Know the location of the fire extinguisher, fire blanket, eyewash station, and first aid kit.
9. Keep your work area uncluttered. Take to the lab station only what is necessary.



Heating Safety

9. When lighting a burner, **wait until the striker is in place before you turn on the gas.**
10. **The amount of air can be adjusted by the air supply valve below the tube of the burner. This regulates the flame temperature and color.**
11. **Never leave a burner or hotpla unattended.**



First Aid

Injury: Burns

What To Do: Immediately flush with cold water until burning sen n is lessened.

First Aid

Injury: Cuts, bruises

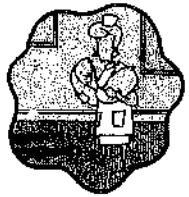
What To Do: Do not touch an open wound without safety gloves.

directly on minor cuts will ding in a few minutes. d compress to bruises to reduce swelling.

First Aid

Injury: Fainting

To Do: Provide <u>fresh</u> air and have the person recline so that their head is <u>lower</u> than the rest of their body.



d. eye injury?

e. poisoning?

f. spills on the skin?

g. electrical shock?

Scientific Method
Science Safety Rules

Name _____

The Bikini Bottom gang has been learning safety rules during science class. Read the paragraphs below to find the broken safety rules and underline each one. How many can you find?

SpongeBob, Patrick, and Gary were thrilled when Mr. Krabbs gave their teacher a chemistry set! Mr. Krabbs warned them to be careful and reminded them to follow the safety rules they had learned in science class. The teacher passed out the materials and provided each person with an experiment book.

SpongeBob and Gary flipped through the book and decided to test the properties of a mystery substance. Since the teacher did not tell them to wear the safety goggles, they left them on the table. SpongeBob lit the Bunsen burner and then reached across the flame to get a test tube from Gary. In the process, he knocked over a bottle of the mystery substance and a little bit splashed on Gary. SpongeBob poured some of the substance into a test tube and began to heat it. When it started to bubble he looked into the test tube to see what was happening and pointed it towards Gary so he could see. Gary thought it smelled weird so he took a deep whiff of it. He didn't think it smelled poisonous and tasted a little bit of the substance. They were worried about running out of time, so they left the test tube and materials on the table and moved to a different station to try another experiment.

Patrick didn't want to waste any time reading the directions, so he put on some safety goggles and picked a couple different substances. He tested them with vinegar (a weak acid) to see what would happen even though he didn't have permission to experiment on his own. He noticed that one of the substances did not do anything, but the other one fizzed. He also mixed two substances together to see what would happen, but didn't notice anything. He saw SpongeBob and Gary heating something in a test tube and decided to do that test. He ran over to that station and knocked over a couple bottles that SpongeBob had left open. After cleaning up the spills, he read the directions and found the materials he needed. The only test tube he could find had a small crack in it, but he decided to use it anyway. He lit the Bunsen burner and used tongs to hold the test tube over the flame. He forgot to move his notebook away from the flame and almost caught it on fire.

Before they could do another experiment, the bell rang and they rushed to put everything away. Since they didn't have much time, Patrick didn't clean out his test tube before putting it in the cabinet. SpongeBob noticed that he had a small cut on his finger, but decided he didn't have time to tell the teacher about it. Since they were late, they skipped washing their hands and hurried to the next class.

Name_____ Date _____ Table #____

Lab Equipment

Name each piece of equipment that would be useful for each of the following tasks:

1. Holding 100mL of water (ebkare) _____
2. Measuring 27 mL of liquid (daudgtear ldnreiyc) _____
3. Measuring exactly 43mL of an acid (rtube) _____
4. Massing out 120 g of sodium chloride (acbnela) _____
5. Suspending glassware over the Bunsen burner (rwei za: gu) _____
6. Used to pour liquids into containers with small openings or to hold filter paper (unfenl)_____
7. Mixing a small amount of chemicals together (lewl lapa) _____
8. Heating contents in a test tube (estt ubet smalcp) _____
9. Holding many test tubes filled with chemicals (est: ube: karc) _____
10. Used to clean the inside of test tubes or graduated cylinders (iwer srbuh) _____
11. Keeping liquid contents in a beaker from splattering (rahcw sgasl) _____
12. A narrow-mouthed container used to transport, heat or store substances, often used when a stopper is required (ymerereel kslaf) _____
13. Heating contents in the lab (nuesnb bneurr) _____
14. Transport a hot beaker (gntos) _____
15. Protects the eyes from flying objects or chemical splashes (ggloges)_____
16. Used to grind chemicals to powder (tmraor rda stlepr) _____

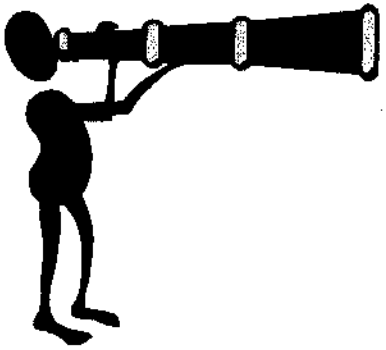
Scientific Method

Steps in the Scientific Method

- Observation
- Hypothesis
- Experiment
- Data Collection
- Conclusion
- Retest

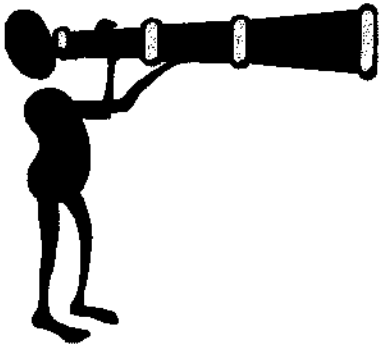
Observations

- Gathered through your senses
- A scientist notices something in their natural world



Observations

- An example of an observation might be noticing that many salamanders near a pond have curved, not straight, tails



Experiment

A good or "valid" experiment will only have ONE variable!

Scientific Experiments Follow Rules

- An experimenter changes one factor and observes or measures what happens.

The Control Variable

- The experimenter makes a special effort to keep other factors constant so that they will not effect the outcome.
- Those factors are called control variables.

What is the Purpose of a Control?

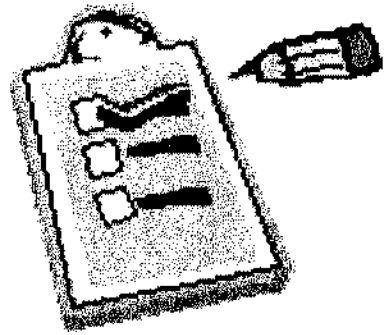
- Controls are NOT being tested
- Controls are used for COMPARISON

Remember: To be a Valid Experiment:

- Two groups are required --- the control & experimental groups
- There should be only one variable

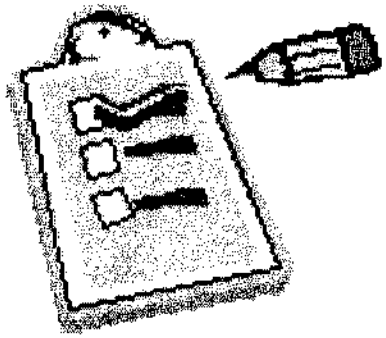
Data

- Results of the experiment
- May be quantitative (numbers) or qualitative



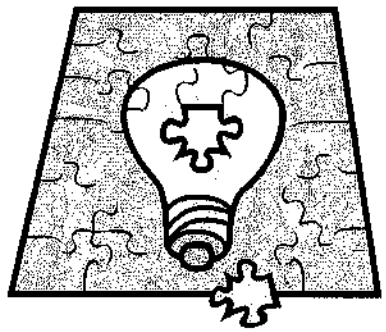
Data

- Must be organized
- Can be organized into charts, tables, or graphs



Conclusion

- The answer to the hypothesis based on the data obtained from the experiment



Virtual Learning

Scientific Method PPT Questions

Steps in the Scientific Method:

1. Name the steps in the scientific method.

2. Explain a scientist's first step in the scientific method.

3. Give an example of an observation that a scientist might make.

4. Scientists use their _____ to make observations.

5. What is a hypothesis?

6. A hypothesis must be _____ and it _____ an outcome.

7. Some hypotheses are written as _____ statements.

8. Write a hypothesis for the observation you wrote in question 3.

b. the dependent variable?

c. the control variable?

20. The best experiments make _____ trials with the independent variable.

Valid Experiments

21. Name the two group needed to have a valid experiment.

22. What is data?

23. What are the two types of data?

24. If the data is numbers, this is called _____ data.

25. To be useful, collected data must be _____.

26. Name 3 ways of organizing data.

27. What is the conclusion of an experiment?

28. What must be done to verify the results of an experiment?

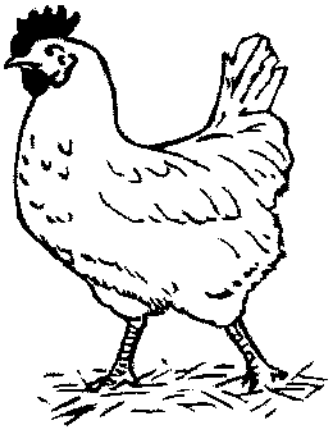
Review

29. To solve a problem, you should _____ the problem and state _____ you have made about it.

30. Next, you form a _____ or prediction and conduct an _____ to test the prediction.

Name: _____ Date: _____

Scientific Method In Action - *The Strange Case of BeriBeri*



In 1887 a strange nerve disease attacked the people in the Dutch East Indies. The disease was beriberi. Symptoms of the disease include weakness and loss of appetite, victims often died of heart failure. Scientists thought the disease might be caused by bacteria. They injected chickens with bacteria from the blood of patients with beriberi. The injected chickens became sick. However, so did a group of chickens that were not injected with bacteria.

One of the scientists, Dr. Eijkman, designed a new experiment based on his own observations. Before the experiment, all the chickens had eaten whole-grain rice, but during the experiment, the chickens were fed polished rice. Dr. Eijkman researched this interesting case and found that polished rice lacked thiamine, a vitamin necessary for good health.

1. State the question or problem that Dr. Eijkman investigated.

2. What was the original hypothesis?

3. What was the **manipulated** (independent) variable and the **responding** (dependent) variable?

4. Write a statement that summarizes the results of the experiment.

5. How would Dr. Eijkman test his new hypothesis?

How Penicillin Was Discovered

In 1928, Sir Alexander Fleming was studying Staphylococcus bacteria growing in culture dishes. He noticed that a mold called Penicillium was also growing in some of the dishes. A clear area existed around the mold because all the bacteria that had grown in this area had died. In the culture dishes without the mold, no clear areas were present.

Fleming hypothesized that the mold must be producing a chemical that killed the bacteria. He decided to isolate this substance and test it to see if it would kill bacteria. Fleming transferred the mold to a nutrient broth solution. This solution contained all the materials the mold needed to grow. After the mold grew, he removed it from the nutrient broth and then added the broth to a culture of bacteria. He observed that the bacteria in the culture died. Fleming's experiments were later used to develop antibiotics.

6. State the question or problem that Fleming investigated.

7. What was Fleming's hypothesis?

8. How was the hypothesis tested?

9. Write a statement that summarizes the results of the experiment.

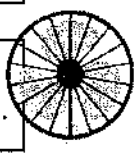
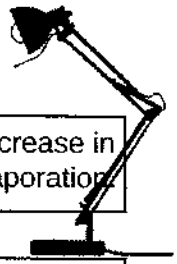
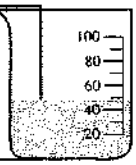
10. This experiment led to the development of what major medical advancement?

Name: _____

Scientific Method: How Can a Causal Question Be Answered?

Directions: Examine the flow chart below which considers a question about water evaporation. Multiple hypotheses are tested and conclusions drawn from the given results of the experiments. Answer the questions regarding the experiments.

Question: What factors increase the rate of water evaporation?

Hypothesis #1: An increase in temperature will increase evaporation.	Hypothesis #2: An increase in air flow will increase evaporation.	Hypothesis #3: An increase in light will increase evaporation.
Experiment 1: Beakers of water stored at different temperatures.	Experiment 2: A beaker of water placed in front of a fan. 	Experiment 3: Beakers of water under different lights. 
Prediction 1: Beakers stored at high temperatures will lose more water.	Prediction 2: Beakers in front of the fan will lose more water.	Prediction 3: Beakers stored under light will lose more water.
Results 1: 10 degrees = 5 ml loss 20 degrees = 8 ml loss 30 degrees = 12 ml loss 	Results 2: Beaker / fan = 10 ml loss Beaker only = 8 ml loss	Results 3: No light = 8 ml loss Dim light = 8 ml loss Bright light = 12 ml loss
Conclusion 1: Hypothesis #1 supported	Conclusion 2: Hypothesis #2 supported	Conclusion 3: Hypothesis #3 supported

1. What are the independent and dependent variables in each of the experiments?

2. What information should be added to the diagram to give the reader a better understanding of how these experiments were conducted.

3. What variables should have been CONTROLLED in the experiments.

4. How much confidence would you have in the conclusion of experiment 3 if you found out that temperature was not a controlled variable? Explain your reasoning.

5. On the back of this page, create your own flow chart to answer a causal question. Be creative!

Scientific Method - Group Project

Instructions: Give each group or pair one of the scenarios below. Ask the group to design and experiment to answer the experimental question. Students should identify a control group, dependent and independent variables and possible outcomes or what type of data would be gathered. Stress to students that they will not actually be performing these experiments. Have students either turn in their design on paper or do a mini-presentation to the class.

Does the wavelength of light (R.O.Y.G.B.I.V.) affect a plant's growth? 

Does tomato juice make hair grow faster? 

Is acid rain causing a decline of frog populations? 

Does the hormone estrogen increase the milk yield of dairy cows? 

Does the size of a fish tank determine how large a fish will grow? 

Does aspirin keep cut roses fresher longer? 

LAB REPORT TEMPLATE

Title:

- *A brief concise, yet descriptive title*

Statement of the Problem:

- *What question(s) are you trying to answer?*
- *Include any preliminary observations or background information about the subject*

Hypothesis

- *Write a possible solution for the problem*
- *Make sure this possible solution is a complete sentence*
- *Make sure the statement is testable*
- *The statement should reference the independent and dependent variables: such as "The plant group receiving (independent variable i.e. fertilizer) will (dependent variable i.e. produce more fruit) than the plants that did not receive (independent variable i.e. fertilizer)*

Materials:

- *Make a list of all items used in the lab*

Procedure:

- *Write a paragraph or a list which explains what you did in the lab.*
- *Your procedure should be written so than anyone else could repeat the experiment.*

Results:

- *This section should include any data tables, observations, or additional notes you make during the lab.*
- *Although some students may wish to recopy original data: it is important to always preserve the original*
- *You may attach a separate sheet(s) if necessary.*
- *All tables, graphs and charts should be labeled appropriately.*

Conclusions:

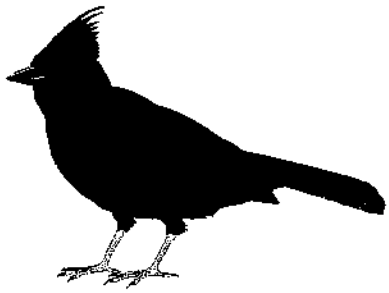
- *Accept or reject your hypothesis*
- *EXPLAIN why you accepted or rejected your hypothesis using data from the lab.*
- *Include a summary of the data – averages, highest, lowest, etc. to help the reader understand your results.*
- *List one thing you learned and describe how it applies to a real-life situation.*
- *discuss possible errors that could have occurred in the collection of data (experimental errors)*

LAB REPORT RUBRIC

LAB REPORT ITEMS	Points	Points Received
PROBLEM	10	
HYPOTHESIS (Independent & dependent variables included)	10	
MATERIALS & PROCEDURE (All steps clearly stated)	15	
OBSERVATIONS AND DATA (Measurement units identified)	20	
GRAPHS AND/OR ILLUSTRATION (Title, axes labeled, data points plotted)	20	
CONCLUSION (Answers the problem, explains results)	15	
NEATNESS	10	
TOTAL GRADE	100	

Name: _____ Date:_____

Data Nuggets: Deadly Windows (adapted from http://datanuggets.org/?s=window)



Have you ever accidentally run into a glass door or been confused by a tall mirror in a restaurant? Just like people, birds can mistake a see-through window or a mirrored pane for an opening to fly through. These **window collisions** can hurt the bird or even kill it. Window collisions kill nearly one billion birds every year!

Urban areas, with a lot of houses and stores, have a lot of windows. **Resident birds** that live in the area may get to know these buildings well and may learn to avoid the windows. However, not all the birds in an area live there year-round. There are also **migrant birds** that fly through urban areas during their seasonal migrations. During the fall migration, people have noticed that it seems like more birds fly into windows. This may be because migrant birds, especially the ones born that summer, are not familiar with the local buildings. It could also be that there are simply more window collisions in the fall because there are more birds in the area when migrant and resident birds co-occur in urban areas.

1. What is the difference between a migrant bird and a resident bird?

2. Why might more migrant birds fly into windows?

Zookeepers also noticed that birds were flying into exhibit windows. They wanted to find out if the birds that hit the windows were more likely to be migrant birds than resident birds. In order to answer this question, they developed a way to gather data on the number of birds in the area and the number of birds that flew into windows.

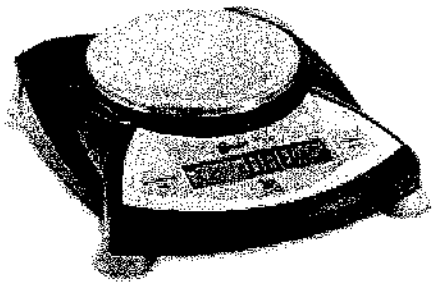
First, to count the total number of birds, nets were placed around the campus at about window height. Birds that flew into these nests were not harmed, and researchers could examine them to identify what kind of bird they were (resident or migrant). This information told them the total number of birds in the area that were flying at window height.

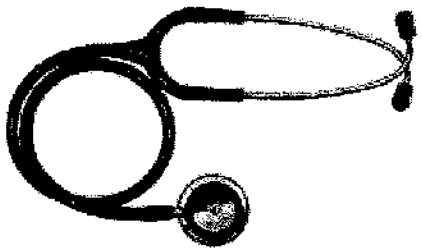
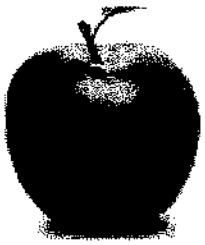
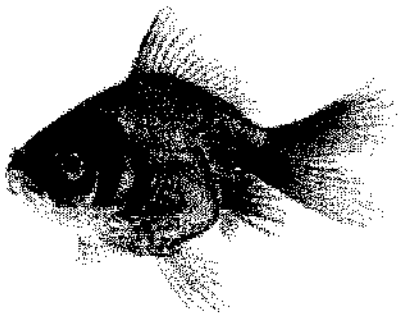
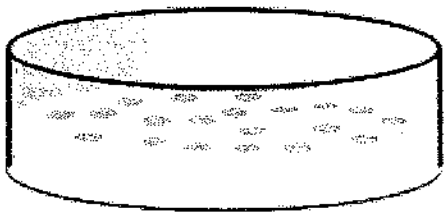
To count the number of birds that hit windows, researchers could simply count the number of dead or injured birds found on the campus near windows. **If window collisions are really more dangerous for migrants, researchers predicted that a higher proportion of migrants would fly into windows than were caught in the nets.**

Name:_____Date: _____

Independent and Dependent Variables Scenarios

(Manipulated and Responding)

Scenario		Independent Variable	Dependent Variable
1. A cow is given a growth hormone and then compared to another cow that was not given a growth hormone. Both cows were weighed at 2 years.			
2. Mosquito repellent is sprayed on one arm and the other arm is not sprayed. The number of mosquito bites is counted after 2 hours.			
3. One grape is placed in tap water and another grape is placed in salt water. The change in their mass is measured after a day.			
4.Two different cars are traveling at 60 mph. At a certain point, both cars slam on the brakes. The distance it takes for each car to stop is then measured.			

9. The blood pressure of a soldier is measured while he is resting. The soldier is then exposed to a stressful environment and his blood pressure is measured again.			
10. An apple is cut into slices. Half of the slices are sprayed with lemon juice. All slices are stored in a sealed plastic bag. After 4 days, they are observed to see how brown they turned.			
11. The respiration rate of a goldfish is measured. The goldfish is then placed in cold water and the respiration rate is measured again.			
12. Bacteria are grown in a petri dish. One side of the dish is sprayed with an antibiotic. After a week, the number of bacteria colonies are counted on each side.			

2	29	21
5	36	27
10	45	40
16	32	50
25	20	34
30	10	20

Answer the following questions based on the graph you just completed.

2. What is the independent variable?

_____

3. Why is this the independent variable?

_____

4. What is the dependent variable?

_____

5. Why is this the dependent variable?

_____

2. What is the independent variable?

3. Why is this the independent variable?

4. What is the dependent variable?

5. Why is this the dependent variable?

6. Which, if any of the above individuals has diabetes? Be sure to justify your answer!

7. If the time period were extended to 6 hours, what would be the expected blood sugar level for Person B?

8. What would be a probable blood sugar level for person B at 3.5 hours?

Lab Report

Name –
Grade –
Teacher -

How can you make a bubble last longer?

Objective – (5 points)
Hypothesis (5 points)
Explanation for hypothesis (5 points)
Materials –(5 points)
Procedure steps (5 points)
Data Table (10 points)
Variables (5 points)
Graph (20 Points)
Conclusion (10 points)
Discipline and procedure , clean up (30 points)

You may use any 5 factors from the list below to add to the bubble solution to test your experiment. Students will create a procedure and use materials available around the house.

Salt, sugar, corn syrup, glycerin, love, water, dye, oil, corn starch

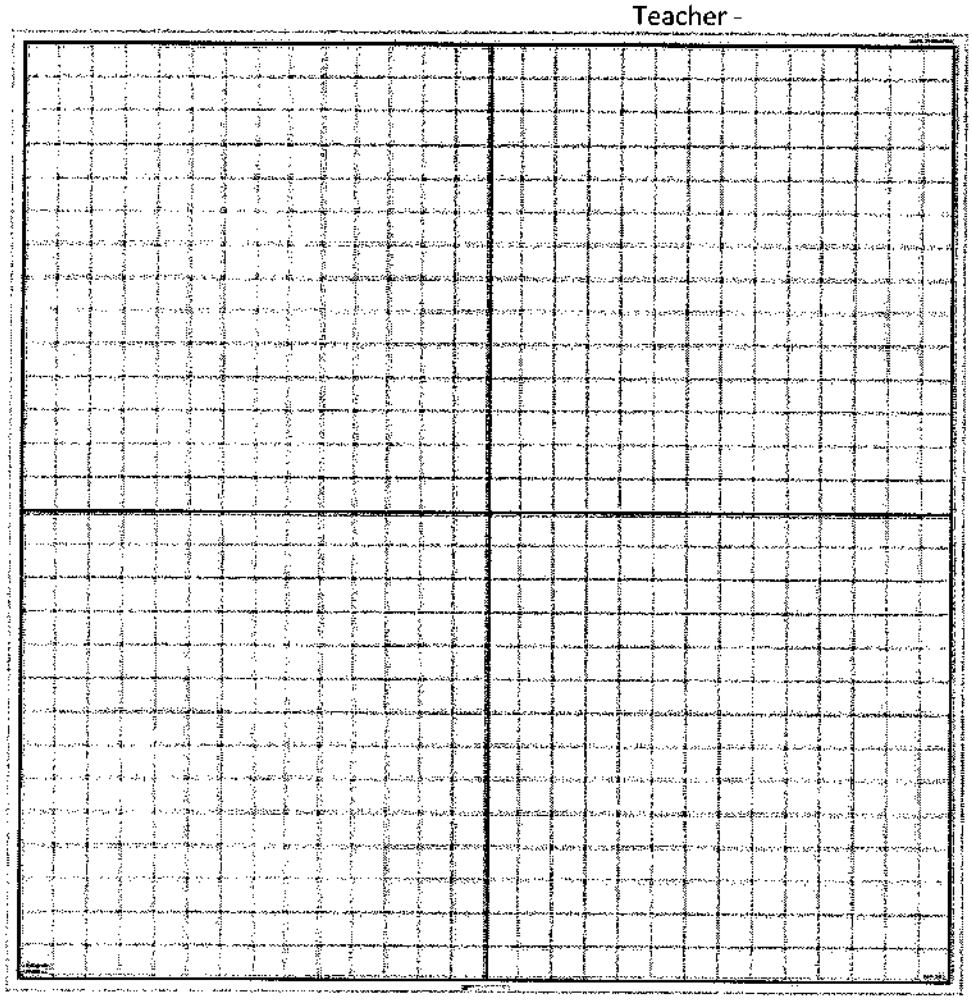
Sample Data table

	Bubble solution(BS)	BS + salt	BS + Sugar	BS + Corn syrup	BS + Love	BS + water
	Life span of bubble in minutes / seconds					
Trial 1						
Trial 2						
Trial 3						
Average						

Average = (Trial 1 + Trial 2 + Trial 3)/3

Lab Report

Name –
Grade –
Teacher -



Conclusion (10 points)

Name:_____ Date:_____

Reinforcement - Scientific Processes

experiment	responding	observing	quantitative
manipulated	qualitative	hypothesis	theory
evidence	law	natural	inference

1. Science is a body of knowledge that explains the _____world.
2. Gathering information with the senses: _____.
3. A logical interpretation based on observations: _____
4. All claims in science should be supported by _____.

5. Type of data that is measured with numbers; example: temperature of water: _____
6. Type of data that is in the form of a description; example: color of the water: _____

7. A proposed explanation that can be tested: _____
8. A step-by-step procedure that is used to test a hypothesis: _____

9. The thing that the scientist changes in an experiment: _____ variable
10. What is measured or observed in an experiment: _____ variable

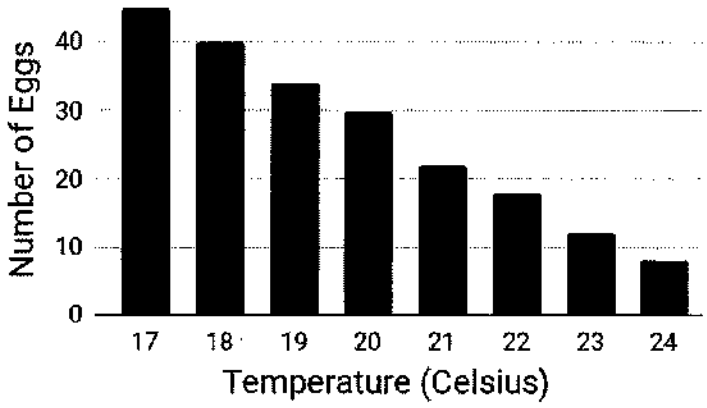
11. In science, a _____ combines observations and explains WHY. (Ex. Evolution)
12. In science, a _____ is used to make predictions, telling us WHAT will happen.

Analyzing Data

The graph shows the number of shrimp hatched at different temperatures.

What is the manipulated variable? _____

What is the responding variable? _____



How would you summarize or caption this graph? In one sentence, connect the two variables.