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: shaik@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

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Friday – September 11th Lab safety ,Lab equipment Quiz	Monday – September 14th Scientific Method and ppt and Note taking
Tuesday – September 15Th Scientific Method and ppt and Note taking Variables	Wednesday – September 16th Identifying variables
Thursday – September 17th Data and Graph Practice	Friday- September 18th Data and Graph Practice
Monday – September 21st Inquiry Lab and Lab report	

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 $\left(9.8 \frac{m}{s^2}\right.$ or m/s/s)

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

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)

Periodic Table of the Elements

Period	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	Group 11	Group 12	Group 13	Group 14	Group 15	Group 16	Group 17	Group 18
1	1 H Hydrogen 1.01																	2 He Helium 4.00
2	3 Li Lithium 6.94	4 Be Beryllium 9.01											5 B Boron 10.81	6 C Carbon 12.01	7 N Nitrogen 14.01	8 O Oxygen 16.00	9 F Fluorine 19.00	10 Ne Neon 20.18
3	11 Na Sodium 22.99	12 Mg Magnesium 24.31											13 Al Aluminum 26.98	14 Si Silicon 28.09	15 P Phosphorus 30.97	16 S Sulfur 32.07	17 Cl Chlorine 35.45	18 Ar Argon 39.95
4	19 K Potassium 39.10	20 Ca Calcium 40.08	21 Sc Scandium 44.96	22 Ti Titanium 47.88	23 V Vanadium 50.94	24 Cr Chromium 52.0	25 Mn Manganese 54.94	26 Fe Iron 55.85	27 Co Cobalt 58.93	28 Ni Nickel 58.69	29 Cu Copper 63.55	30 Zn Zinc 65.39	31 Ga Gallium 69.72	32 Ge Germanium 72.61	33 As Arsenic 74.92	34 Se Selenium 78.96	35 Br Bromine 79.90	36 Kr Krypton 83.80
5	37 Rb Rubidium 85.47	38 Sr Strontium 87.62	39 Y Yttrium 88.91	40 Zr Zirconium 91.22	41 Nb Niobium 92.91	42 Mo Molybdenum 95.94	43 Tc Technetium [98]	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.91	46 Pd Palladium 106.42	47 Ag Silver 107.87	48 Cd Cadmium 112.41	49 In Iodium 114.82	50 Sn Tin 118.71	51 Sb Antimony 121.76	52 Te Tellurium 127.60	53 I Iodine 126.90	54 Xe Xenon 131.29
6	55 Cs Cesium 132.91	56 Ba Barium 137.33	57 La* Lanthanum 138.91	72 Hf Hafnium 178.49	73 Ta Tantalum 180.95	74 W Tungsten 183.85	75 Re Rhenium 186.21	76 Os Osmium 190.23	77 Ir Iridium 192.22	78 Pt Platinum 195.08	79 Au Gold 196.97	80 Hg Mercury 200.59	81 Tl Thallium 204.38	82 Pb Lead 207.20	83 Bi Bismuth 208.98	84 Po Polonium [209]	85 At Astatine [210]	86 Rn Radon [222]
7	87 Fr Francium [223]	88 Ra Radium [226]	89 Ac Actinium [227]	104 Rf Rutherfordium [261]	105 Db Dubnium [262]	106 Sg Seaborgium [263]	107 Bh Bohrium [264]	108 Hs Hassium [265]	109 Mt Meitnerium [268]	110 Uun Ununnilium [281]	111 Uuu Unununium [272]	112 Uub Ununbium [277]		114 Uuq Ununquadium [285]		116 Uuh Ununhexium [289]		118 Uuo Ununoctium [293]

KEY: Atomic Number 6 · Symbol C · Name Carbon · Average Atomic Mass 12.01

Lanthanide Series	58 Ce Cerium 140.12	59 Pr Praseodymium 140.91	60 Nd Neodymium 144.24	61 Pm Promethium [145]	62 Sm Samarium 150.36	63 Eu Europium 151.96	64 Gd Gadolinium 157.25	65 Tb Terbium 158.93	66 Dy Dysprosium 162.50	67 Ho Holmium 164.93	68 Er Erbium 167.26	69 Tm Thulium 168.93	70 Yb Ytterbium 173.04	71 Lu Lutetium 174.97
Actinide Series	90 Th Thorium 232.04	91 Pa Protactinium 231.04	92 U Uranium 238.03	93 Np Neptunium [237]	94 Pu Plutonium [244]	95 Am Americium [243]	96 Cm Curium [247]	97 Bk Berkelium [247]	98 Cf Californium [251]	99 Es Einsteinium [252]	100 Fm Fermium [257]	101 Md Mendelevium [258]	102 No Nobelium [259]	103 Lr Lawrencium [262]

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.

Rules and Procedures: Students must follow classroom rules and procedures such as respect and courtesy as well as school wide rules and policies. Consequences for broken rules will follow school wide policies and regulations.

In class rules: You are expected to abide by the MHS and MSDI rules and regulations.

1. **Respect others, their property, and their right to get the best education they can.**
2. **Bring all materials to class every day and listen to instructions.**
3. **No personal grooming allowed. Please refrain from spraying any type of liquid in the classroom due to different allergies. No food in the classroom. Water bottles are allowed, however, on lab days they will need to be put away.**
4. **Be responsible for all of your actions and behavior.**
5. **No cell phones.**
6. **Do not sit on lab counters or rearrange desks.**

Homework:

- Homework should be turned in on the due date in the designated tray or submitted online
- If a student has a genuine reason, you will be excused and the homework will be accepted the next day with for a complete credit.
- If Home work is submitted the day after the due date, it will be accepted for 80% credit.
- Later submissions will get a credit of 60%.

Bellwork: should be turned in as classwork.
Extra Help: Can be provided via email, set up a meeting on teams, remind app, or face to face meeting, on Tuesday, 3:30 to 4:30 pm

GRADING POLICY-

A- 90 – 100
B- 80-89
C- 70-79
D- 60-69
F - **0 -59**

Major Assessments (tests and projects)= 40%
Formative Assessments (quizzes, lab, lab reports)= 30%
Classwork/Homework= 20%
Writing/Reading (bell work/essays)= 10%

Make Up Work for Absences:
Students are responsible for requesting make up work upon their return to school/class for all missed work. You will have 5 school days to make up work. Labs and Tests/Quizzes will be made up according to the mutual convenience of the Teacher and the student.

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:

- Vulgarity (no cursing, vulgar language, or inappropriate gestures, memes)
- Negative feedback on other's work and /or comments
- Posting negativity, bully others in chats
- Unacceptable noises in background- loud music, noisy pets
- No smoking, vaping, drinking alcohol beverages
- General Housekeeping Reminders:
- Minimize background noise by turning off the TV and radio
- Stay Focused! Avoid multitasking during class!
- Mute your microphones until it is your turn to speak.

Consequences:
1st offense- warning/student conference
2nd offense- parent notification
3rd offense- guidance referral
4th offense- office referral
severe disruption of instruction or safety will results in immediate referral and removal from class

Incentives/Rewards: these will be given for positive behavior, good work habits, and improvement in course work.

I greatly appreciate your co-operation and support to make the learning a wonderful experience
Thank you,

I have read and totally agree to follow the policies set forth above in this contract. I will closely follow the oral or written instructions provided by the teacher and/or school administrator.

Student Name- _____ Signature-

Parent Name - _____ Signature-

Date- _____

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.

IN10494

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Student Safety Contract
Continued

33. Never return unused chemicals to their original containers.
34. Never use mouth suction to fill a pipet. Use a rubber bulb or pipet pump.
35. When transferring reagents from one container to another, hold the containers away from your body.
36. Acids must be handled with extreme care. You will be shown the proper method for diluting strong acids. Always add acid to water, swirl or stir the solution and be careful of the heat produced, particularly with sulfuric acid.
37. Handle flammable hazardous liquids over a pan to contain spills. Never dispense flammable liquids anywhere near an open flame or source of heat.
38. Never remove chemicals or other materials from the laboratory area.
39. Take great care when transporting acids and other chemicals from one part of the laboratory to another. Hold them securely and walk carefully.

HANDLING GLASSWARE AND EQUIPMENT

40. Carry glass tubing, especially long pieces, in a vertical position to minimize the likelihood of breakage and injury.
41. Never handle broken glass with your bare hands. Use a brush and dustpan to clean up broken glass. Place broken or waste glassware in the designated glass disposal container.
42. Inserting and removing glass tubing from rubber stoppers can be dangerous. Always lubricate glassware (tubing, thistle tubes, thermometers, etc.) before attempting to insert it in a stopper. Always protect your hands with towels or cotton gloves when inserting glass tubing into, or removing it from, a rubber stopper. If a piece of glassware becomes "frozen" in a stopper, take it to your instructor for removal.
43. Fill wash bottles only with distilled water and use only as intended, e.g., rinsing glassware and equipment, or adding water to a container.
44. When removing an electrical plug from its socket, grasp the plug, not the electrical cord. Hands must be completely dry before touching an electrical switch, plug, or outlet.
45. Examine glassware before each use. Never use chipped or cracked glassware. Never use dirty glassware.
46. Report damaged electrical equipment immediately. Look for things such as frayed cords, exposed wires, and loose connections. Do not use damaged electrical equipment.
47. If you do not understand how to use a piece of equipment, ask the instructor for help.
48. Do not immerse hot glassware in cold water; it may shatter.

HEATING SUBSTANCES

49. Exercise extreme caution when using a gas burner. Take care that hair, clothing and hands are a safe distance from the flame at all times. Do not put any substance into the flame unless specifically instructed to do so. Never reach over an exposed flame. Light gas (or alcohol) burners only as instructed by the teacher.
50. Never leave a lit burner unattended. Never leave anything that is being heated or is visibly reacting unattended. Always turn the burner or hot plate off when not in use.
51. You will be instructed in the proper method of heating and boiling liquids in test tubes. Do not point the open end of a test tube being heated at yourself or anyone else.
52. Heated metals and glass remain very hot for a long time. They should be set aside to cool and picked up with caution. Use tongs or heat-protective gloves if necessary.
53. Never look into a container that is being heated.
54. Do not place hot apparatus directly on the laboratory desk. Always use an insulating pad. Allow plenty of time for hot apparatus to cool before touching it.
55. When bending glass, allow time for the glass to cool before further handling. Hot and cold glass have the same visual appearance. Determine if an object is hot by bringing the back of your hand close to it prior to grasping it.

QUESTIONS

56. Do you wear contact lenses?
☐ YES ☐ NO
57. Are you color blind?
☐ YES ☐ NO
58. Do you have allergies?
☐ YES ☐ NO
If so, list specific allergies _____

AGREEMENT

I, _____
_____(student's name)have read and agree to follow all of the safety rules set forth in this contract. I realize that I must obey these rules to ensure my own safety, and that of my fellow students and instructors. I will cooperate to the fullest extent with my instructor and fellow students to maintain a safe lab environment. I will also closely follow the oral and written instructions provided by the instructor. I am aware that any violation of this safety contract that results in unsafe conduct in the laboratory or misbehavior on my part, may result in being removed from the laboratory, detention, receiving a failing grade, and/or dismissal from the course.

_____
Student Signature

_____
Date

Dear Parent or Guardian:

We feel that you should be informed regarding the school's effort to create and maintain a safe science classroom/laboratory environment.

With the cooperation of the instructors, parents, and students, a safety instruction program can eliminate, prevent, and correct possible hazards.

You should be aware of the safety instructions your son/daughter will receive before engaging in any laboratory work. Please read the list of safety rules above. No student will be permitted to perform laboratory activities unless this contract is signed by both the student and parent/guardian and is on file with the teacher.

Your signature on this contract indicates that you have read this Student Safety Contract, are aware of the measures taken to ensure the safety of your son/daughter in the science laboratory, and will instruct your son/daughter to uphold his/her agreement to follow these rules and procedures in the laboratory.

_____
Parent/Guardian Signature

_____
Date

IN10494

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 ...les Continued...

Dispose of all chemical waste properly. Never mix chemicals in sink drains. Sinks are to be used only for water.

Labels and equipment instructions must be read carefully before use.

Keep hands away from face, eyes, mouth, and body while using chemicals or lab equipment. Wash your hands with soap and water after performing all experiments.

Safety Rules Continued...

- Know the locations and operating procedures of all safety equipment including: first aid kit(s), and fire extinguisher. Know where the fire alarm and the exits are located.
- Any time chemicals, heat, or glassware are used, students will wear safety goggles.
- Dress properly during a laboratory activity. Long hair, dangling jewelry, and loose or baggy clothing are a hazard in the laboratory. Long hair must be tied back, and dangling jewelry and baggy clothing must be secured. Shoes must completely cover the foot. No sandals allowed on lab days.

Safety Rules Continued...

- Report any accident (spill, breakage, etc.) or injury (cut, burn, etc.) to the teacher immediately, no matter how trivial it seems. Do not panic.
- If you or your lab partner is hurt, immediately (and loudly) yell out the teacher's name to get the teacher's attention. Do not panic.
- If a chemical should splash in your eye(s) or on your skin, immediately flush with running water for at least 20 minutes. Immediately (and loudly) yell out the teacher's name to get the teacher's attention.

Safety Rules Continued...

- Never return unused chemicals to their original container.
- Never remove chemicals or other materials from the laboratory area.
- Never handle broken glass with your bare hands. Use a brush and dustpan to clean up broken glass. Place broken glass in the designated glass disposal container.

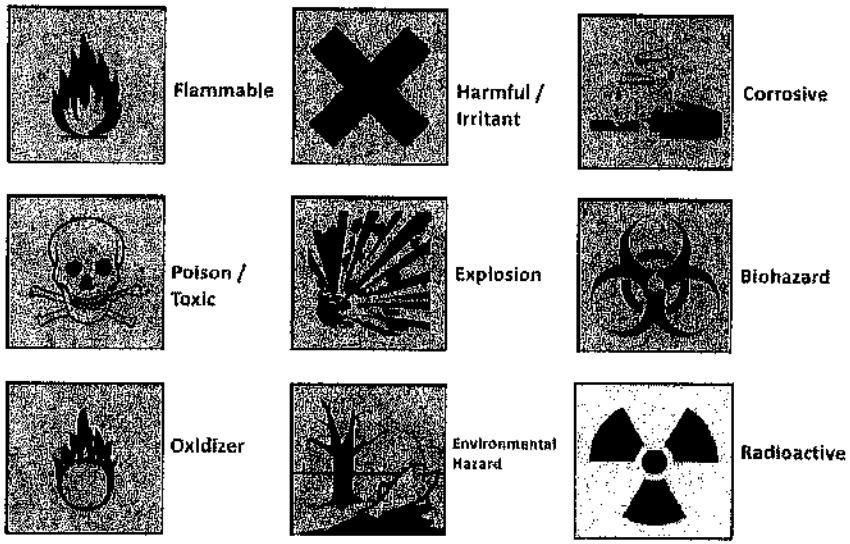
Safety Rules Continued...

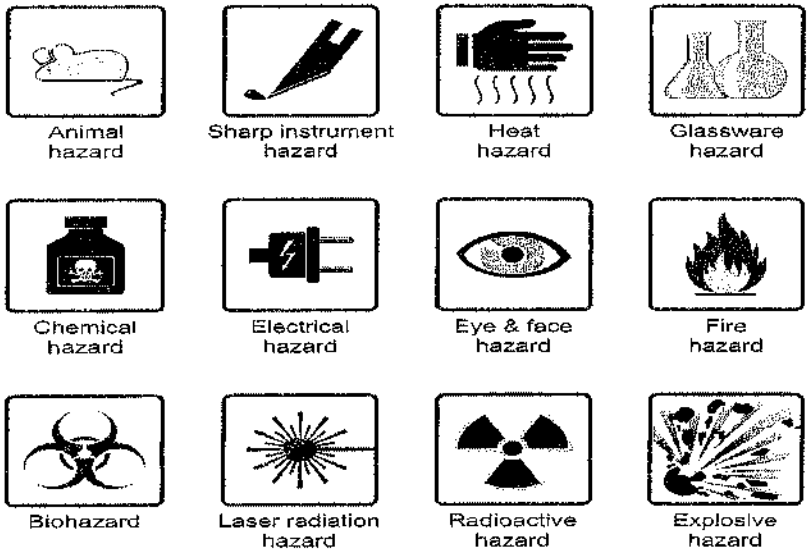
- If you do not understand how to use a piece of equipment, ASK THE TEACHER FOR HELP!

- 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

Assignment details

Virtual Students : Use a powerpoint, google slide, or any other poster sites to create a 12 slide presentation that illustrates the ten safety rules you feel are broken the most.

Slide-1 Intro , Slide 2-11 Rules, Slide 12 Conclusion • Due on Sept 10th.

Students with Packets (Remote /Elearning) : Use a poster, notebook paper, or any construction paper to illustrate ten safety rules you feel are broken the most by drawing , pasting pictures, cartoons or magazine cut outs to your paper of choice.

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.		

Short Answer

Directions: Answer the following questions on the lines below.

13. What do you think is the most important lab safety rule? Explain.

14. What are some things that you can do before a lab even begins to get ready? Name at least two.

15. Name two things that you should do when conducting an investigation in the "field".

16. What should you do at the end of a lab? Name at least two things.

What Not to Do

Directions: Read the following scenarios of some unsafe lab behaviors. Briefly explain what the student should have done instead.

17. Jared was using a compound microscope to look at onion cells. The bell rang, so he pulled the cord out of the outlet before he left for his next class.

18. Scarlett was testing the flammability of some different fabrics using tweezers and a tea-light. Her long hair kept falling forward, so she had to keep tossing it out of the way.

19. Jim was measuring out a white substance onto a triple-beam balance. He was getting hot, so he pulled his safety goggles off his eyes and rested them on his head.

20. Leyla started to feel very warm and light headed during the dissection lab, but she didn't want to bother the teacher or call any attention to herself, so she just kept quiet.

Look up "Accident at Jefferson High" on youtube and ~~find the~~ 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?

8. What should you do with any equipment once you are finished?

9. What materials should NOT be present around a gas burner?

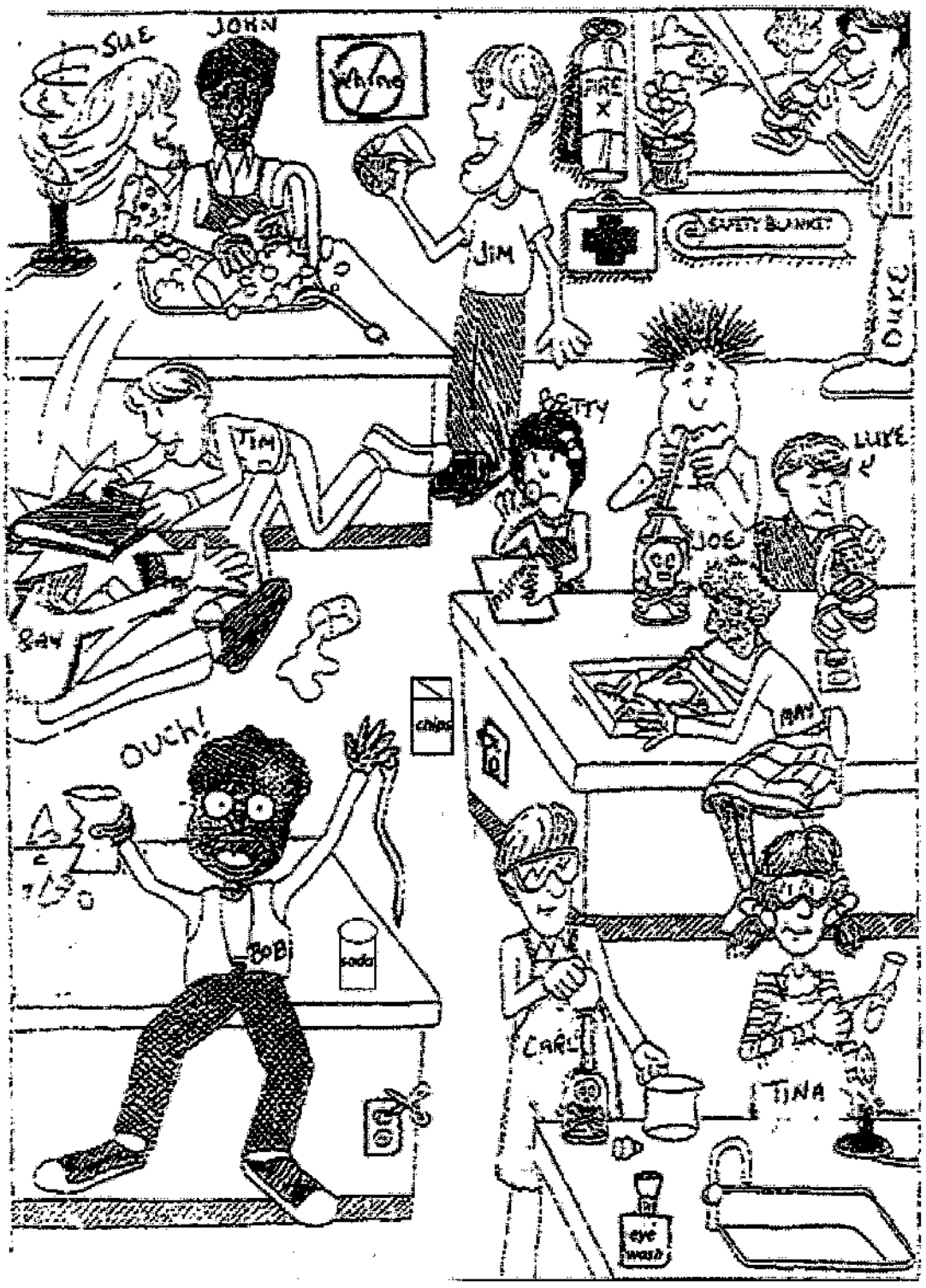
10. What is the best way to determine if heated glass is cooled?

11. How do you extinguish an alcohol fire?

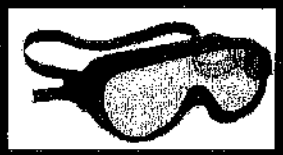
12. What should be used to put out a fire on a person's clothing?

Name_____Date_____

Lab Safety



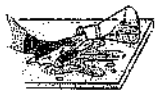
1. List 3 unsafe activities showsn in the illustration and explain why each is unsafe.
2. List 3 correct lab procedures depicted in the illustration.
3. What should Bob do after the accident?
4. What should Sue have done to avoid an accident?
5. What are three things shown in the lab that should not 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.



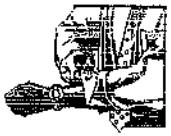
General Safety Rules

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

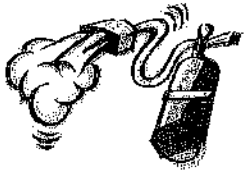
5. During lab work, keep your hands away from your face.
6. Tie back long hair.

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.



Chemical Safety

1. Wear protective goggles and a lab apron whenever heating or pouring hazardous chemicals.

2. Never mix chemicals together unless you are told to do so (and then only in the manner specified).
3. Never taste any chemicals (you should never taste anything in the lab).

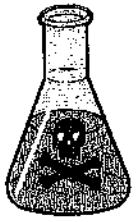
Chemical Safety

4. If you need to smell the odor of a chemical, waft the fumes toward your nose with one hand. Do not put your nose over the container and inhale the fumes.

5. Never pour water into a concentrated acid. Acid should be poured slowly into water.

Chemical Safety

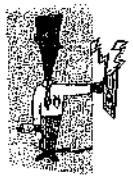
6. Follow the instructions of your teacher when disposing of all chemicals.
7. Wash your hands after handling hazardous chemicals.



Electrical Safety

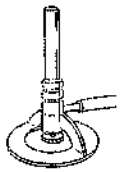
1. Lay electrical cords where no one can trip on them or get caught in them.

2. Be sure your hands and your lab area are dry before using electrical equipment.
3. Never poke anything into electrical outlets.



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.

Lab Safety **ppt Questions**

General Safety Rules

1. What should you do before starting any lab?

2. How should you protect your eyes?

3. What is the first thing you should do if there is an accident in the lab?

4. After using any chemical always remember to do what?

5. Why should you keep your hands away from your face during lab?

6. What should be done with long hair or loose sleeves before starting lab?

7. Tell the location of:

   a. fire extinguisher?

   b. eyewash?

   c. emergency exits?

   d. first aid kit?

8. What should be at your lab station or table?

9. If you wear contacts, what safety precaution should you take during lab?

10. Should you ever put anything into your mouth during lab?

d. eye injury?

e. poisoning?

f. spills on the skin?

g. electrical shock?

Scientific Method Name _____
Science Safety Rules

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.

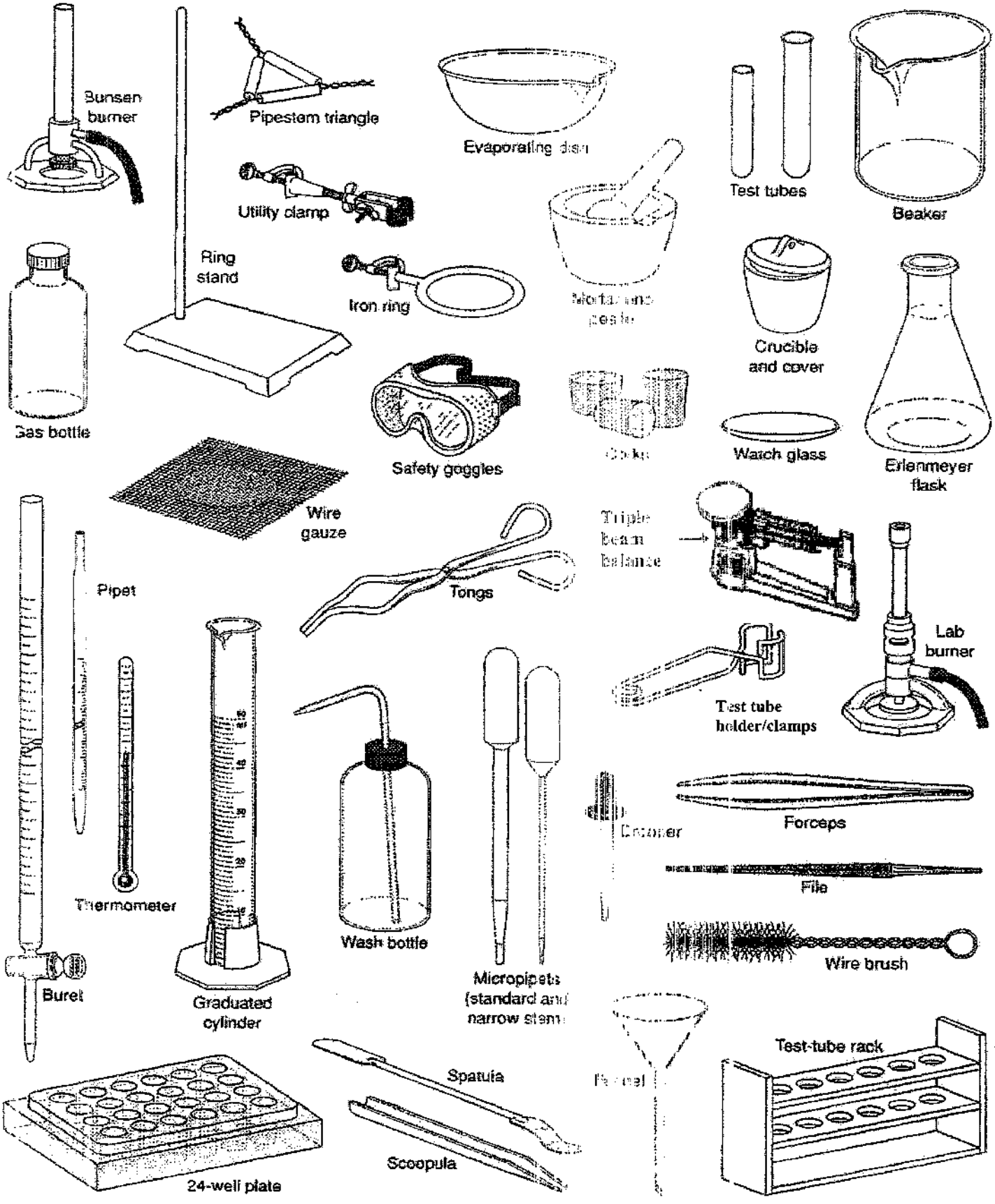
SpongeBob and Gary flipped through the book and decided to test the properties of a mystery substance. Since the teacher did not tell them to wear the safety goggles, they left them on the table. SpongeBob lit the Bunsen burner and then reached across the flame to get a test tube from Gary. In the process, 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 #____

Directions: A number of items that may be used in the laboratory are shown below. Study this page and decide what the items may be used for. Use the names of the equipment shown to answer the questions included.



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 (zwei zeugu) _____
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 lerpa) _____
8. Heating contents in a test tube (estt ubet smalcp) _____
9. Holding many test tubes filled with chemicals (estt ubet 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 nda stlepe) _____

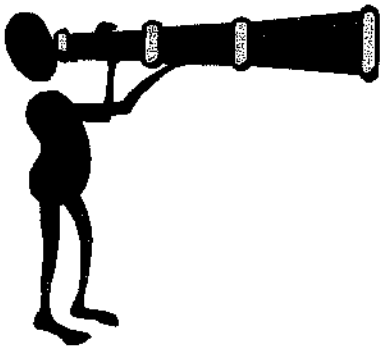
Scientific Method

Steps in the Scientific Method

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

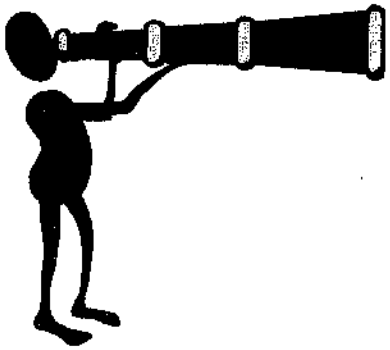
Observations

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



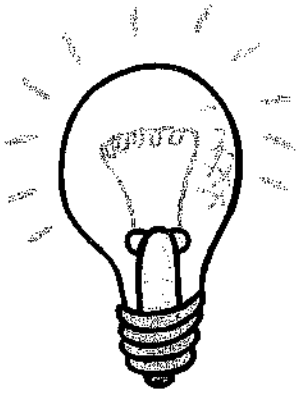
Observations

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



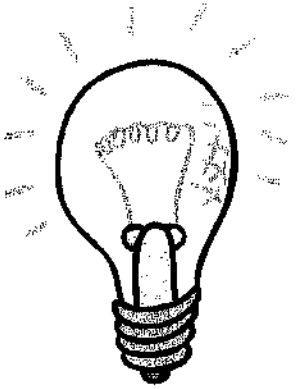
Hypothesis

- A suggested solution to the problem.
- Must be testable
- Sometimes written as If…Then… statements
- Predicts an outcome



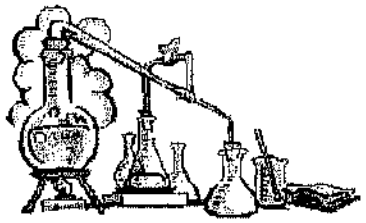
Hypothesis

- An example of a hypothesis might be that the salamanders have curved tails due to a pollutant in the moist soil where they live.



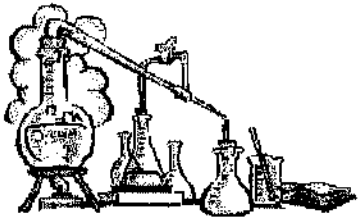
Experiment

- A procedure to test the hypothesis.



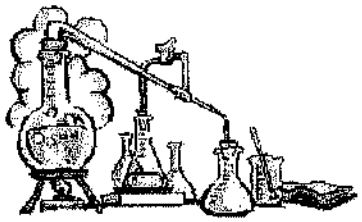
Experiment

Variable – factor in the experiment that is being tested



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

Other Variables

- The factor that is changed is known as the **independent variable.**
- The factor that is measured or observed is called the **dependent variable.**

Example of Controls & Variables

- For example, suppose you want to figure out the fastest route to walk home from school.
- You will try several different routes and time how long it takes you to get home by each one.
- Since you are only interested in finding a route that is fastest for you, you will do the walking yourself.

What are the Variables in Your Experiment?

- **Varying the route is the independent variable**
- **The time it takes is the dependent variable**
- **Keeping the same walker throughout makes the walker a control variable.**

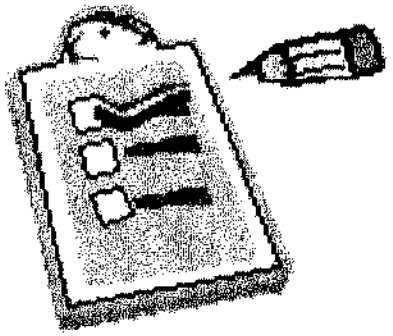
One more thing... it is best to make several trials with each independent variable.

Remember: To be a Valid Experiment:

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

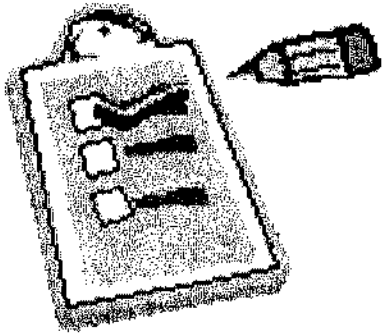
Data

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



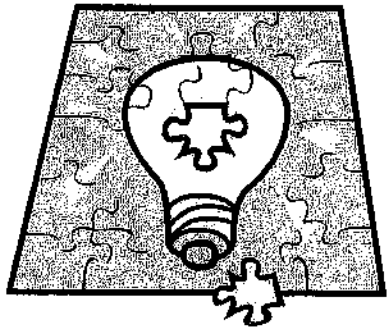
Data

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



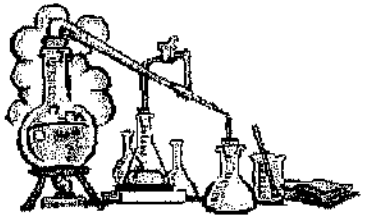
Conclusion

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



Retest

In order to verify the results, experiments must be retested.



Solving a Problem

1)Identify a Problem
2) State Observations about the problem
3) Form a Hypothesis about the problem (if...then...)
4) Design an Experiment to test the hypothesis
5) Collect Data
6) Form a Conclusion
7) Retest

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.

9. What is an experiment?

10. What part of an experiment is the variable?

11. How many variables should there be in a good experiment?

Controls and Variables

12. An experimenter changes _____ factor and then observes and _____ what happens.

13. Other factors in an experiment must be kept _____ so they won't effect the _____.

14. What are these constant factors called?

15. What is the purpose of having a control in an experiment?

16. Name the two types of variables in an experiment.

17. What is the independent variable?

18. What is the independent variable?

19. In the experiment to find the fastest route to school, what serves as:

a. the independent variable?

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?

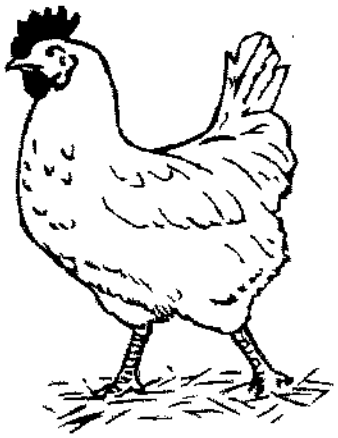
Review

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.

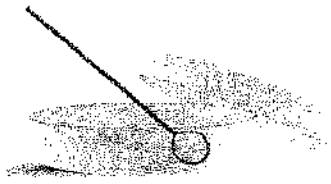
1. State the question or problem that Dr. Eijkman investigated.

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 _____ Date _____

Scientific Method - Manipulated and Responding Variables

Jordan is doing a science fair project on the effects of music on the growth of tomatoes. He has two tomato plants, Plant A and Plant B, that he grows in a window and gives the same amount of water. Plant A is exposed to classical music using headphones attached to the soil. Throughout the growth period, Jordan counts the number of tomatoes produced by each plant.

Plant A = 35 tomatoes Plant B = 55 tomatoes

1) What is the control group?

2) What is the manipulated variable?

3) What is the responding variable?

4) What should Jordan's conclusion be? Write this in a complete sentence!

5) Jordan needs to repeat the experiment, but his teacher says that he needs to improve his design. In his second experiment, what should he do differently?

In the same science fair, Tina asks the question "Does caffeine increase the heart rate of an earthworm?" In Test 1, she measures the heart rate by looking at the earthworm under a microscope, the earthworm has a heart rate of 50 bpm (beats per minute). In Test 2, she places a few drops of caffeine on the earthworm's skin and measures the rate again. In this test, the heart rate is 68 bpm.

6) What is the manipulated variable?

7) What is the responding variable?

8) Tina's experiment should have included a hypothesis. In a complete sentence, suggest a hypothesis for Tina's experiment.

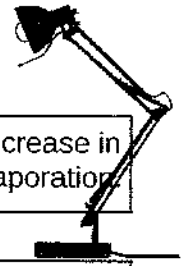
Name: _____

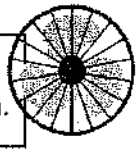
Scientific Method: How Can a Causal Question Be Answered?

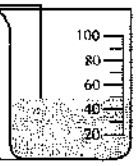
Directions: Examine the flow chart below which considers a question about water evaporation. Multiple hypotheses are tested and conclusions drawn from the given results of the experiments. Answer the questions regarding the experiments.

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 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? 

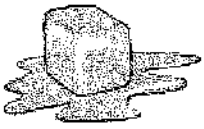
Does aspirin keep cut roses fresher longer? 

Will crickets chirp more if the temperature is warmer?

Do wounds heal faster when they are covered by Band-Aids?

Which battery lasts longer, energizer or duracell?

Does hot water freeze faster than cold water?



Do tanning beds cause skin cancer?

What causes leaves to fall in autumn (light, temperature, or both)?

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)*

HIGH SCHOOL LAB REPORT FORM

(Name) _____ (Date) _____

Title:

Purpose/Problem

Hypothesis:

Materials/Supplies:

Procedure:

Observations and Data:

Conclusion/Summary:

Conclusion Do's and Don'ts

- **Do** draw an illustration or a graph, if appropriate.
- **Don't** list the data again, but summarize, discuss, and analyze the data.
- **Do** explain why your hypothesis was correct or incorrect from your observations or data.
- **Don't** give the procedure again, but **do** point out possible sources of error.
- **Don't** forget to break up your ideas with more than one paragraph. Your conclusion is an essay.

Helpful format for writing a conclusion
(Length of blank lines does NOT indicate the length of your entries – additional sentences <u>are</u> encouraged)

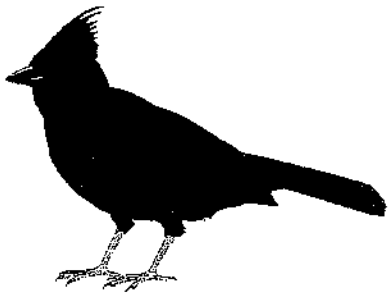
This lab (experiment) investigated _____.
In order to study the problem we _____.
My results showed _____, thus proving my hypothesis was (correct/incorrect).
I believe the results are (accurate/inaccurate) because _____.
In order to further investigate this problem, next time I would _____.

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?

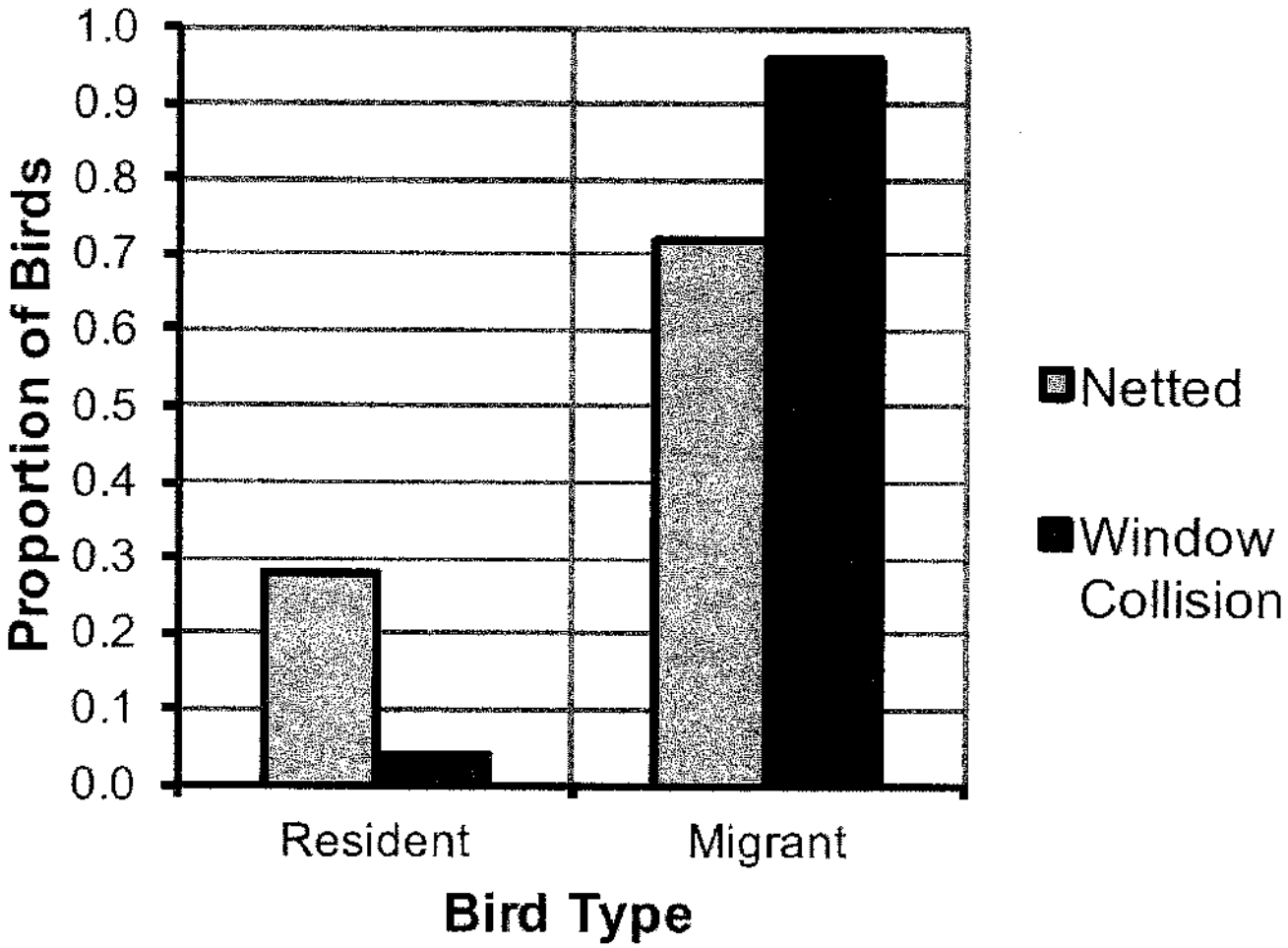
Zookeepers also noticed that birds were flying into exhibit windows. They wanted to find out if the birds that hit the windows were more likely to be migrant birds than resident birds. In order to answer this question, they developed a way to gather data on the number of birds in the area and the number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

3. The scientific question was: Do migrant birds collide with windows more frequently than expected by their population? What is the hypothesis proposed by the researchers.

4. Use the **I² strategy** to analyze the data below (annotate)

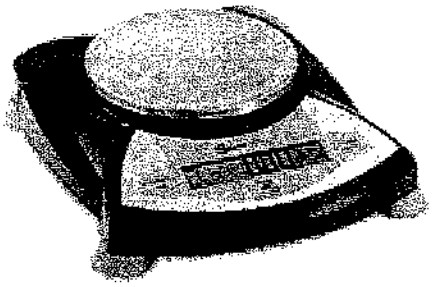


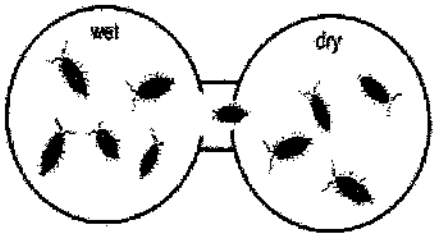
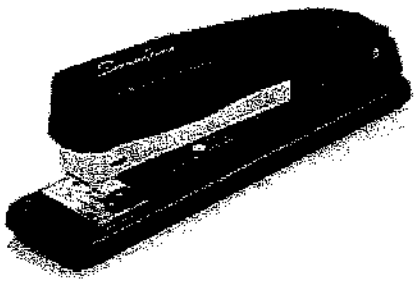
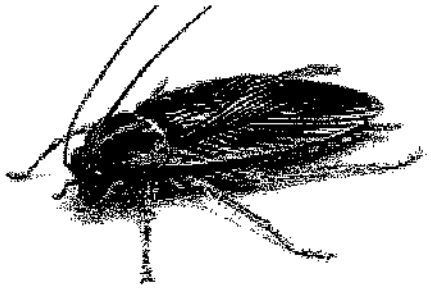
5. Create a caption for the graph, the caption to answer the experimental question. Be sure to write it in a complete sentence.

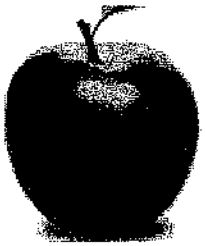
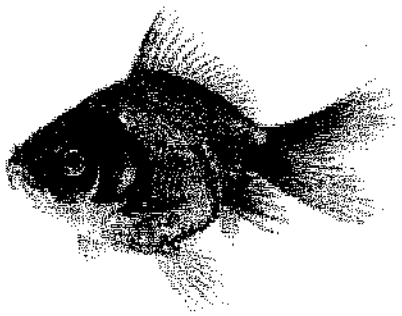
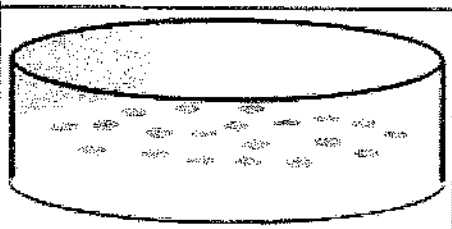
Name:_____Date: _____

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.			

5. Pillbugs are placed in a container where they have a choice of a wet or a dry environment. Researchers record how much time was spent on each side.			
6. A stapler is used to staple 100 papers, it jams 5 times during the trial. A different brand of stapler performs the same test; it jams 22 times.			
7. Cockroaches are exposed to a pesticide. After 3 hours, 95% of the insects are dead.			
8. Two plants are grown using the same light and pots. One plant is given water that has been microwaved and the other plant is given regular tap water. Their height is measured after 2 weeks.			

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.			

Name _____ Period

Graphing Activity

Introduction

Graphing is used by scientists to display the data that is collected during a controlled experiment.A line graph must be constructed to accurately depict the data collected. An incorrect graph will often lead to the acceptance of an incorrect hypothesis or detract from the acceptance of a correct hypothesis.The graph should contain 5 major parts: The title, the independent variable, the dependent variable,the scales for each variable, and a legend.

1.) **The title:** this shows what the graph is about. Reading the title should give the reader an idea about the graph. It should be a concise statement placed above the graph.

2.) **The Independent Variable:** this is the variable (part of the experiment that changes) that can be controlled or manipulated by the experimenter. This variable should be placed on the horizontal or x-axis.

3.) **The Dependent Variable**: this is the variable directly affected by the independent variable.It is the result of what happens because of the independent variable. This variable is placed on the y or vertical axis.

4.)**The Scales for each Variable**: In constructing a graph, one needs to know where to plot

the points representing the data. In order to do this a scale must be employed that will include all the data points. Each block should have a consistent amount or increment on a particular axis. While the scale should allow as much of the graph to be taken up as possible, it is not a good idea to set up a scale that is hard to manage. For example, multiples of 5, 10, etc.are good, while multiples such as 1.22 are not! Your scale must be plotted on the amount of graph space available, and will be dictated by the data points.

5.)**The Legend**: this is a short descriptive narrative concerning the graph's data. It should be short and to the point and placed directly under the graph.

1.)Use the data in the table below to complete the graph provided. Remember to title your

graph, label the axes properly when setting up your scale, make a key, and to write a legend

for your graph when completed.

Depth in meters	**Number of bubbles/min Plant A**	**Number of Bubbles/min Plant B**

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?

_____

Graph Practice #2 Example:

Diabetes is a disease affecting the insulin producing glands of the pancreas. If there is not enough insulin being produced by the cells, the amount of glucose in the blood will remain high. A blood glucose level above 140 for an extended period of time is not considered normal. This disease, if not brought under control, will lead to severe complications and even death.

1.Use the data in the table below to complete the graph provided. Remember to title your

graph, label the axes properly when setting up your scale, make a key, and to write a legend

for your graph when completed.

Time After Eating (hrs.)	Glucose Level in ml/liter of blood in person A	Glucose Level in ml/liter of blood in person B
0.5	170	180
1	155	195
1.5	140	230
2	135	245
2.5	140	235
3	135	225
4	130	200

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?

_____

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 -

Objective – (2.5 points)

Hypothesis (2.5 points)

Materials –(5 points)

Procedure steps (5 points)

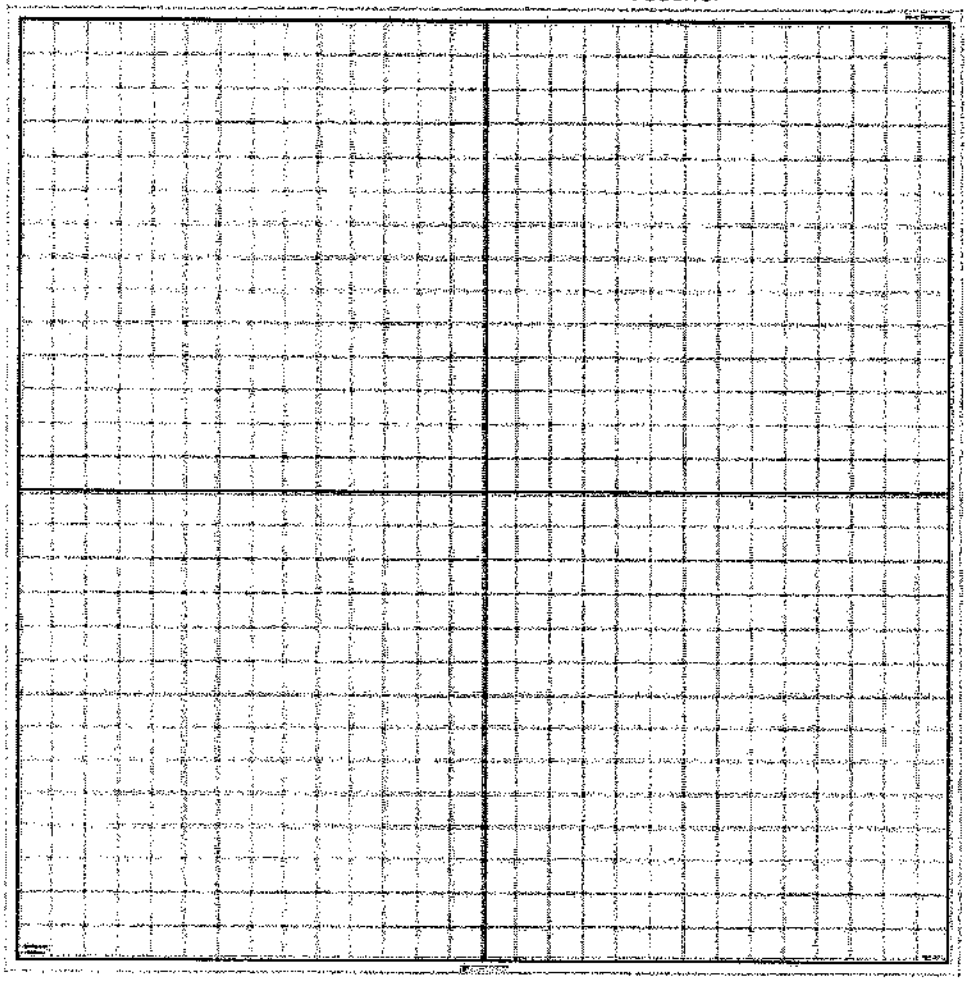
Data Table (10 points)

Variables (5 points)

Graph (10 Points)

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

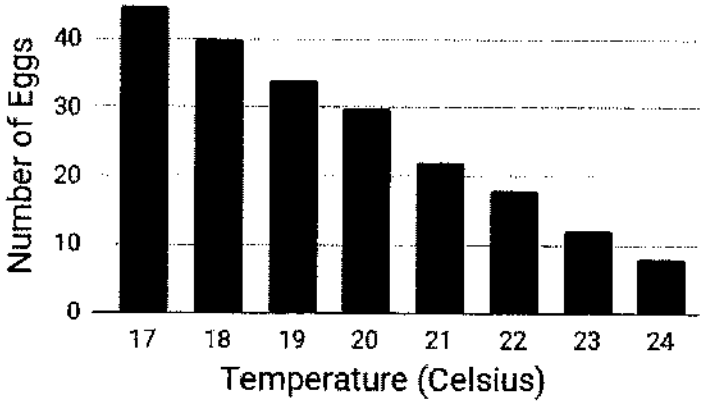
11. In science, a _____ combines observations and explains WHY. (Ex. Evolution)
12. In science, a _____ is used to make predictions, telling us WHAT will happen.

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.