Chemistry Unit 1 – Matter

Name:

Period:

Matter has definite structure that determines characteristic physical and chemical properties: Apply an understanding of atomic and molecular structure to explain the properties of matter, and predict outcomes of chemical reactions.

Chemistry Daily Journal

|  |  |  |
| --- | --- | --- |
| Today’s Date | What did I accomplish yesterday? | What are my goals today? What sections, activities, and labs do I want to get done today? |
|  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Objective** | Learning Opportunities | **Suggested Due Date** | **Date Completed** |
| 1.1 Identify lab equipment and procedures. | Read p. 1-17; p. 11, # 1-4; p. 17, #8-13 Vodcast 1.1 Lab Safety and Introductory InformationSign and Return Syllabus and Safety ContractSafety LabLab Safety Quiz and MapLab Equipment Round Robin | 08/08 |  |
| 1.2 Identify and describe the steps of the scientific method. Understand the difference between a theory and a law. | Vodcast 1.2 Scientific MethodSet Up Binder, Lab Notebook, and purchase school supplies Burning of Mg LabIdentify Controls and VariablesRead p. 20-27; p. 25, #16-23Chapter One Vocab Quiz | 08/13 |  |
| 1.3 Differentiate between elements, mixtures and compounds. | Classification of MatterBasic Chemical Names and SymbolsRead p. 44-52; p. 47, #11-17; p. 52, #20-27POGIL Classification of Matter TEAM | 08/15 |  |
| 1.4 Separate mixtures based on physical properties | Vodcast 1.5 Water Purification PrelabWater Purification Lab |  |  |
| 1.5 Compare and contrast chemical and physical properties. | Vodcast 1.3 Properties of Matter Read p. 39-42; p. 42, #1-6Five States of Matter FishbowlChemical vs Physical Properties “Rally- Coach”  | 08/20 |  |
| 1.6 Classify changes as physical or chemical.  | Vodcast 1.4 Changes in MatterChemical vs Physical Changes Demonstrations Chemical vs Physical Changes “Rally-Coach’Vodcast 1.6 Copper Chloride PrelabRead p. 53- 55; p. 55, #29-33Copper Chloride LabUnit 1 Review | 08/21 |  |

**LAB SAFETY!**

**Complete the information below as you listen to the Rhythm, Rhyme, Results song “Lab Safety”**

1. Important eye equipment for lab work. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Neither of these should be in your mouth when working in a lab (2 answers). \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Where to go if a large fire starts in a lab \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. You should always wear these to protect your hands \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. What chemicals can do to you if not handled carefully (three possible answers) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
6. This should be put securely on a bottle before it’s put away \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
7. A liquid for use if a foreign substance gets in your eye \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
8. Before you leave the lab for the day you should always \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
9. This should happen before you begin work in a lab \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
10. These body parts should receive covered protection in a lab (4 answers)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. The proper way to smell a mixture or chemical in a lab. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. This should be done to a workstation before leaving the lab \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. These should not be worn on your feet in a lab \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Waste should always be deposited in one of these \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. This should be done to flasks as a part of the cleanup in a lab.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. When using electricity or electrical sources, there may be a risk of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Use your phone or iPod to take a picture of the QR code and view the song again on YouTube.

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**Safety Lab**

Goggles and apron are required!

**Station 1: What does acid do to your clothes?**

Materials: 6M hydrochloric acid, spot plate, nylon

Procedure:

1. Place a small piece of nylon cloth in a well of the spot plate.

2. Drop enough HCl on the nylon to cover it.

3. Observe the reaction and describe what happened.

4. To cleanup remove the damaged nylon with a paper towel, taking care not to touch the acid with your skin. Toss the paper towel into the garbage can by your lab station.

5. Rinse and dry the spot plate.

Results and Conclusion:

Write in sentence form the results of the experiment. For the conclusion, explain how this relates to your safety in the lab and how you can keep yourself safe.

**Station 2: How does acid and bleach affect you?**

Materials: 6M HCl, 0.1M bleach solution, egg whites, plastic pipette, small beaker, spot plate

Procedure:

1. Using the plastic pipette place a drop of egg whites in two wells of the spot plate. (don’t contaminate the egg whites in the beaker)

2. Add a drop of acid to one of the wells and a drop of bleach to the other well.

3. Make observations of the reactions.

4. Place a drop of the bleach solution on your finger and rub your fingers together. (DO NOT DO THIS WITH THE ACID!)

5. Record how it feels.

6. Rinse and dry the spot plate. Run water in the sink so the coagulated egg white will be flushed down the sink.

Results and Conclusion:

Write in sentence form the results of the experiment. For the conclusion, explain how this relates to your safety in the lab and how you can keep yourself safe.

**Station 3: Not all clear solutions are water!**

Materials: water (H2O), 0.1M sodium hydroxide (NaOH), 0.1M hydrochloric acid (HCl), spot plate, red litmus paper, blue litmus paper, pH paper, plastic beaker for disposal of paper

Procedure:

1. Place one drop of each of the clear liquids in a well of the spot plate (keeping track of which liquid is where).

2. Touch each liquid with each type of litmus paper. Note the original color of the paper and what color it changed. Write this in the data table.

3. Touch each liquid with a piece of pH paper. Note the color change and compare the color to the pH reading on the side of the vial. Make note of the pH number in your data table.

4. To cleanup place all the paper strips in the waste beaker provided. Rinse and dry the spot plate.

5. Acids turn litmus paper red and bases turn litmus paper blue. Which substance is an acid, a base, and neutral?

Sample Data Table:

|  |  |  |  |
| --- | --- | --- | --- |
| Clear Liquid | Red Litmus Paper | Blue Litmus Paper | pH Number |
| HCl |  |  |  |
| NaOH |  |  |  |
| H2O |  |  |  |

Results and Conclusion:

Write in sentence form the results of the experiment. For the conclusion, explain how this relates to your safety in the lab and how you can keep yourself safe.

**Station 4: Messy Mystery Station**

Materials: Bunsen burner, ring stand, ring, wire gauze, beaker, lab manual, candy, bottle of water, lighter.

Procedure:

1. Record everything you see in great detail. Imagine you are describing a crime scene. Do not move anything or eat anything!

Results and Conclusion:

Why did I place these items together in this manner? What do they represent? For the conclusion, explain how this relates to your safety in the lab and how you can keep yourself safe.

**Station 5: Using Hot Plates**

To use a hot plate, it must first be plugged into the electric line. Some hot plates have an on-off switch that must be turned on to use. Also, some hot plates are adjustable and the control must be turned near the maximum to begin. After the material is brought to the correct temperature, the heating rate can be controlled by reducing the variable control setting or by alternately turning the hot plate on and off with the switch or by unplugging and plugging in the line cord.

Materials: Hot plate, 400 ml beaker, 3 test tubes, tap water, beaker tongs, test tube holders, thermometer, test tube rack

Procedure:

1. Fill the beaker half full of water.

2. Fill a couple of test tubes half full of water.

3. Take the temperature of the room temperature water. Record it in your data table.

4. Using test tube clamps put the test tubes into the beaker of water. Using beaker tongs, lift the filled beaker onto the hot plate.

5. Plug in the hot plate. Heat the water. Start timing.

6. Take the temperature of the water in the test tubes every 30 seconds for 2 ½ minutes. Don’t let the bottom of the thermometer touch the bottom of the test tubes.

7. Unplug the hot plate when finished.

8. Using the appropriate tongs, empty all the containers, being careful not to splash hot water on anyone. Do not clink hot glassware together or rinse hot glassware with cold water.

Data:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Time | 0 sec | 30 sec | 60 sec | 90 sec | 120 sec | 150 sec |
| Temperature(oC) |  |  |  |  |  |  |

Results and Conclusion: Answer the following questions - When cleaning up, why don’t you want to immediately rinse hot glassware? Why do you want to keep the thermometer off the bottom of the container? For the conclusion, explain how this relates to your safety in the lab and how you can keep yourself safe.

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**Station 8**

**Station 7**



**Chemistry Lab Report Rubric**

**Lab: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |
| --- | --- | --- |
| **Table of Contents** | **Points Earned** | **Points Possible** |
| * Includes the title, page numbers, and date of experiment
 |  | 1 |
| **Title** |  |  |
| * Capitalized appropriately, relates to the experiments, underlined at the top of the lab report
 |  | 1 |
| **Question** |  |  |
| * Testable and clearly stated
 |  | 1 |
| * Independent variable, dependent variables, constants (at least 3) and the control are stated
 |  | 3 |
| **Hypothesis** |  |  |
| * States what you are doing, what you predict will happen, and why you think that will happen. If…Then…Because
 |  | 1 |
| **Materials** |  |  |
| * A list of all materials used in the experiment
 |  | 1 |
| **Procedure** |  |  |
| * Write a complete, **DETAILED** procedure. If necessary, include a sketch of the lab setup. Must be valid, limited to one variable at a time, clear and concise.
 |  | 10 |
| **Data** |  |  |
| * Organized table that shows the data you have collected during the experiment
	+ - Include an appropriate title
		- Clearly organize and label data columns and rows
		- Units are clearly identified
		- Accuracy of data is appropriate to measuring equipment or instruments
		- Data from multiple trials is clearly shown
		- Data and table lines are neat and presentable (USE A RULER)
 |  | 3 |
| **Analysis** |  |  |
| * Find the average, percent error or percent yield and standard deviation (shows the calculations and steps taken to arrive at those answers.) Check for outliers and discard if necessary.
 |  | 4 |
| * Graph
	+ - Appropriate type of graph is used
		- Include appropriate title for the graph
		- Label both axes including units
		- Scale for axes is appropriate for range of data
		- Colors, symbols, labels, etc. are employed to make the graph easier to read. Key is included.
		- Data are plotted accurately
		- Graph is neat and presentable (USE A RULER)
 |  | 10 |

|  |  |  |
| --- | --- | --- |
| **Conclusion** |  |  |
| * In the first sentence, summarize your results. Then state whether or not your hypothesis was supported by the data and give **specific details** to prove it. Explain why you think it turned out that way. Is the experimental value different from the theoretical value? Do the results make sense given what you already know? How might the methods you used bias your results? Report the ACTUAL NUMBERS you calculated your average results to be and give a measure of certainty (standard deviation or percent error) with each measurement.
 |  | 4 |
| Error Analysis: Discuss how the 4 types of errors may have influenced the outcome of your experiment. Be sure to tell what direction (too high or too low) the error skewed your data.* Random: natural and unpredictable fluctuations in natural phenomena (for instance, temperature in one location or a beaker may vary slightly from another).
* Environmental: effects of temperature, light, humidity, atmospheric pressure, wind speed, etc that may have had an influence on the outcome of an experiment.
* Instrumental: Every instrument has limitations of accuracy and precision. A measurement is only valid to the lowest possible marking on the instrument, then a best guess is made for the next digit.
* Personal: Human limitations that influence the outcome of an experiment, for instance, reaction time when using a stopwatch. Making a mistake in measurements or calculations, not cleaning glassware or calibrating an instrument would NOT be considered personal error; they are mistakes that should be corrected.
 |  | 4 |
| * Discuss how to change the design to fix the errors. What further questions or investigations does this lead to? Suggest relevant changes and other experiments to improve understanding of the subject.
 |  | 2 |
| **Discussion/Reflection** |  |  |
| * Discuss what you learned from this experiment and how it relates to what we are learning in class and applications in the real world (your world). Examples: Medicine, Pharmacy, Industry, Technology, Mining
 |  | 2 |
| * Explain how the theoretical concepts we are learning in class directly apply to the lab experience. What Theories/ Laws are involved? How did this lab verify or deviate from them?
 |  | 2 |
| **Total Score** |  |  |

Identify the Controls and Variables

|  |  |
| --- | --- |
| mhtml:file://G:\Chemistry\1%20--%20FHS%20Unit%20One%20--%20Matter\Identify%20the%20Controls%20and%20Variables.mht!http://www.biologycorner.com/resources/smithers2.gifSmithers thinks that a special juice will increase the productivity of workers. He creates two groups of 50 workers each and assigns each group the same task (in this case, they're supposed to staple a set of papers). Group A is given the special juice to drink while they work. Group B is not given the special juice. After an hour, Smithers counts how many stacks of papers each group has made. Group A made 1,587 stacks, Group B made 2,113 stacks. | Identify the:1. Control Group2. Independent Variable3. Dependent Variable4. What should Smithers' conclusion be? 5. How could this experiment be improved? |
| mhtml:file://G:\Chemistry\1%20--%20FHS%20Unit%20One%20--%20Matter\Identify%20the%20Controls%20and%20Variables.mht!http://www.biologycorner.com/resources/homer2.gifHomer notices that his shower is covered in a strange green slime. His friend Barney tells him that coconut juice will get rid of the green slime. Homer decides to check this this out by spraying half of the shower with coconut juice. He sprays the other half of the shower with water. After 3 days of "treatment" there is no change in the appearance of the green slime on either side of the shower.  | 6. What was the iniitial observation?Identify the-7. Control Group8. Independent Variable9. Dependent Variable10. What should Homer's conclusion be?  |

|  |  |
| --- | --- |
| Bart believes that mice exposed to radiowaves will become extra strong (maybe mhtml:file://G:\Chemistry\1%20--%20FHS%20Unit%20One%20--%20Matter\Identify%20the%20Controls%20and%20Variables.mht!http://www.biologycorner.com/resources/bart2.gifhe's been reading too much Radioactive Man). He decides to perform this experiment by placing 10 mice near a radio for 5 hours. He compared these 10 mice to another 10 mice that had not been exposed. His test consisted of a heavy block of wood that blocked the mouse food. he found that 8 out of 10 of the radiowaved mice were able to push the block away. 7 out of 10 of the other mice were able to do the same.  | Identify the-11. Control Group12. Independent Variable13. Dependent Variable14. What should Bart's conclusion be?15. How could Bart's experiment be improved?  |
| mhtml:file://G:\Chemistry\1%20--%20FHS%20Unit%20One%20--%20Matter\Identify%20the%20Controls%20and%20Variables.mht!http://www.biologycorner.com/resources/krusty3.gifKrusty was told that a certain itching powder was the newest best thing on the market, it even claims to cause 50% longer lasting itches. Interested in this product, he buys the itching powder and compares it to his usual product. One test subject (A) is sprinkled with the original itching powder, and another test subject (B) was sprinkled with the Experimental itching powder. Subject A reported having itches for 30 minutes. Subject B reported to have itches for 45 minutes.  | Identify the-16. Control Group17. Independent Variable18. Dependent Variable19. Explain whether the data supports the advertisements claims about its product. |
| mhtml:file://G:\Chemistry\1%20--%20FHS%20Unit%20One%20--%20Matter\Identify%20the%20Controls%20and%20Variables.mht!http://www.biologycorner.com/resources/lisa.gifLisa is working on a science project. Her task is to answer the question: "Does Rogooti (which is a commercial hair product) affect the speed of hair growth". Her family is willing to volunteer for the experiment.  | 20. Describe how Lisa would perform this experiment. Identify the control group, and the independent and dependent variables in your description. |

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Classification of Matter

*Classify each of the following as to whether it is a substance or a mixture. If it is a substance, write “Element” or “Compound” in the substance column. If it is a mixture, write “Heterogeneous” or “Homogenous” in the mixture column.*

|  |  |  |
| --- | --- | --- |
| Type of Matter | Substance | Mixture |
| Chlorine |  |  |
| Water |  |  |
| Soil |  |  |
| Sugar Water |  |  |
| Oxygen |  |  |
| Carbon dioxide |  |  |
| Rocky Road ice cream |  |  |
| Alcohol |  |  |
| Pure Air |  |  |
| Iron |  |  |
| Mixed Nuts |  |  |
| Seawater |  |  |
| Table Salt |  |  |
| Aspirin |  |  |
| Mayonnaise |  |  |

**Chemical Symbols and Name Origins**

*Determine the Latin or other name of each element from the list provided and write that name in the space next to the symbol. Underline the letter(s) in the origin name that are used today for the element symbol or name.*

|  |  |  |
| --- | --- | --- |
| Name | Symbol | Latin or Other Name |
| Sodium | Na |  |
| Hydrogen | H |  |
| Silver | Ag | **Names and M eanings**Stannum – LatinAurum – Latin “shining dawn”Ferrum – LatinWolfram – GermanStibium – Latin Kalium – LatinNatrium – Latin; Midieval Latin sodanum “headache remedy”Plumbum – GreekHydragyrus – Greek “liquid silver”Hydro + genes – Greek “water generator”Helios – Greek “sun”Fluere – Latin “flow”Carbo – Latin “charcoal”Kobold – German “goblin”Platina – Spanish “silver”Calx – Latin “lime”Silex – Latin “flint”Borax – PersianArgentium -- Latin |
| Boron | B |  |
| Tungsten | W |  |
| Calcium | Ca |  |
| Iron | Fe |  |
| Tin | Sn |  |
| Silicon | Si |  |
| Gold | Au |  |
| Helium | He |  |
| Potassium | K |  |
| Cobalt | Co |  |
| Carbon | C |  |
| Fluorine | F |  |
| Antimony | Sb |  |
| Mercury | Hg |  |
| Lead | Pb |  |
| Platinum | Pt |  |

**Water Purification Lab**

Purpose: Use the physical properties of water to separate contaminants and obtain pure, clean water with a pH of 7.

Procedure:

Describe in detail the steps you will take to remove solid and liquid contaminants from water. Write in the imperative; DO NOT use personal pronouns! \*Note: There will be no distillation column (as described in chapter 2) available for you to use. Your pre-lab must be complete and your procedure approved by your teacher BEFORE you will be allowed in the lab area.

Possible Equipment

* + Beakers
	+ Dropper Pipet
	+ Erlenmeyer Flask
	+ Gloves
	+ Ring Stands
	+ Glass Stirring Rods
	+ Rings
	+ Tongs
	+ Safety Goggles
	+ Wire Screens
	+ Thermometers
	+ Rubber Tubing
	+ Rubber Stoppers
	+ Glass Tubing
	+ Jar for Water Bath
	+ Cold Water
	+ Bunsen Burners
	+ Matches
	+ Strikers
	+ Iodine
	+ Funnels
	+ Filter Paper
	+ Lab Aprons
	+ Test Tube
	+ Test Tube Holders
	+ Test Tube Brush

**Chemistry Lab Report Rubric**

**Lab: Water Purification**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |
| --- | --- | --- |
| **Table of Contents** | **Points Earned** | **Points Possible** |
| * Includes the title, page numbers, and date of experiment
 |  | 2 |
| **Title** |  |  |
| * Capitalized appropriately, relates to the experiments, underlined at the top of the lab report
 |  | 1 |
| **Problem Statement** |  |  |
| * Testable and clearly stated
 |  | 2 |
| **Hypothesis** |  |  |
| * States what you are doing, what you predict will happen, and why you think that will happen. If…Then…Because
 |  | 2 |
| **Materials** |  |  |
| * A list of all materials YOU used in the experiment
 |  | 1 |
| **Procedure** |  |  |
| * Write a complete, **DETAILED** procedure. If necessary, include a sketch of the lab setup.
 |  | 5 |
| * Independent variable, dependent variables, constants (at least 3), and the control are stated
 |  | 5 |
| **Data** |  |  |
| * 5 observations of the water before the cleaning process
* 10 observations of the water during the cleaning process
* 5 observations of the water after the cleaning process
* Organized in a neat and easy to read format
 |  | 5 |
| **Questions** |  |  |
| 1. What method(s) of separation seemed to work the best for the teams in your lab?
2. What was the pH of your final product?
3. How can you tell whether or not the contaminants were entirely removed from the water?
 |  | 3 |
| **Conclusion** |  |  |
| * Written in paragraph form (minimum of 3 paragraphs)
 |  | 1 |
| * Support or refute your hypothesis. Give reasons why. USE YOUR DATA!
 |  | 5 |
| * Discuss any EXPERIMENTAL error you may have had in the experiment.
 |  | 4 |
| * Discuss how to change the design to fix the errors. What further questions or investigations does this lead to?
 |  | 4 |
| **Discussion/Reflection** |  |  |
| * Discuss what you learned from this experiment and how it relates to what we are learning in class and applications in the real world (your world).
 |  | 4 |
| **Total Points** |  | 44 |

**Chemical and Physical Properties**

*Classify the following properties as either chemical or physical by putting a P (for physical) or a C (for chemical) next to the property.*

1. Blue Color \_\_\_\_\_\_\_ 6. Supports Combustion \_\_\_\_\_\_
2. Density \_\_\_\_\_\_\_ 7. Sour Taste \_\_\_\_\_\_
3. Flammability \_\_\_\_\_\_\_ 8. Hardness \_\_\_\_\_\_
4. Solubility \_\_\_\_\_\_\_ 9. Boiling Point \_\_\_\_\_\_
5. Reacts with acid to for H2 \_\_\_\_\_\_\_ 10. Can Neutralize a Base \_\_\_\_\_\_

**Chemical and Physical Changes**

*Classify the following as being a physical, P or chemical change, C.*

1. Sodium hydroxide dissolves in water.
2. Hydrochloric acid reacts with potassium hydroxide to produce a salt, water, and heat.
3. A pellet of sodium is sliced in two.
4. Water is heated and changed to steam.
5. Potassium chlorate decomposes to potassium chloride and oxygen gas.
6. Iron rusts.
7. When placed in H2O, a sodium pellet catches on fire as hydrogen gas is liberated and sodium hydroxide forms.
8. Evaporation.
9. Ice Melting.
10. Milk sours.
11. Sugar dissolved in water.
12. Wood rotting.
13. Pancakes cooking on a griddle.
14. Grass growing in a lawn.
15. A tire inflated with air.
16. Food is digested in the stomach.
17. Water is absorbed by a paper towel.
18. Melting butter for popcorn.
19. Separating sand from gravel.
20. Mixing lemonade powder in water.

**States of Matter Fishbowl**

**For the Learner/Participant: Before the Discussion**

Topic: Five States of Matter

Take notes on the Researchers’ Blogs so you will be able to explain each of the five states of matter in class.

**For the Learner: During the Discussion**

|  |  |
| --- | --- |
| Critical Points Discussed (do not include your own) | Connections between points discussed: (may include questions, alternative points of view, etc as well as your own points) |

FISHBOWL REGULATIONS: Share and refine ideas; don’t attack.

**For the Learner: After the Discussion**

Formulate your own understanding based on the discussion today

Questions for further investigation

**For the Reseacher/Observer: Before the Discussion**

Topic: Five States of Matter

Use your book, the internet, or other reliable resource to teach your class about one of the five states of matter that you were assigned. Site your research when you comment on our class blog to explain what the state is and how it can be transformed to another state. To find our blog, take a picture of the QR Code below or go to [www.missgrayscience.weebly.com](http://www.missgrayscience.weebly.com) and choose “Blog” from the menu at the top of the homepage.



**For the Researcher/Observer: During the Discussion**

You will not say anything out loud during the discussion, but rather use a netbook to comment in our chat room as the Learners discuss what they know about the five states of matter. Use the following format in your discussion:

Point #1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Evidence: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

You can site pages of the textbook as evidence or you can post a link to an online resource.

Remember: Discuss ideas, not people! If someone says something factually wrong, it’s ok to correct them and provide evidence, but it’s not ok to attack them as a person. We are all learning here!

**For the Researcher: After the Discussion**

Formulate your own understanding based on the discussion today

Questions for further investigation

**Observing a Chemical Reaction**

**Purpose:**

To learn how qualitative and quantitative observations of a chemical reaction are used to formulate a hypothesis.

**Background:**

You and your friend’s feelings about a movie you’ve just seen may be very different. You may disagree about whether you like the movie, or about the movie’s intended meaning. Although you both have observed the same movie, your interpretations of the movie may differ. Distinguishing between observation and interpretation is very important in chemistry. An observation is a statement of fact, based on what you detect by your senses. An interpretation is your judgment or opinion about what you have observed. A statement such as the liquid is clear and colorless is an observation. It would be an interpretation to say, without further testing, the clear and colorless liquid is water.

 The purpose of this experiment is to help you distinguish observation form interpretation while examining a chemical reaction. Try to make as many observation of the reaction as possible. Remember that there are two types of observations: a quantitative observation is an observation that involves a measurement; a qualitative observation is a general description and does not involve a measurement. The “liquid is hot” is a *qualitative* observation. “The temperature of the liquid is 95.0 oC” is a *quantitative* observation.

**Materials:**

Safety goggles

100 mL beaker

thermometer

glass stirring rod

plastic spoon

copper (II) chloride dihydrate CuCl2•2H2O

aluminum foil, 8 cm x 8 cm

distilled water

**Safety First!**

In this lab, the solution you are working with may become quite hot following the addition of aluminum foil. Observe all precautions, especially the ones listed below.

**Procedure:**

1. Obtain and describe a sample of copper (II) chloride dihydrate, CuCl2•2H2O, crystals.
2. Fill the 100 mL beaker about one-fourth full with distilled water. Without stirring, add 1 level teaspoonful of crystals to the water. Record your observation of both the crystals and the water.
3. Use the glass stirring rod to stir the mixture until the crystals are completely dissolved. Record your observations of the solution.
4. Place the thermometer in the copper (II) chloride solution and record the temperature. CAUTION: *Observe the mixture from the side; do not look directly down into the beaker.*  Place a loosely crumpled ball of aluminum in the solution and record your observations. Stir the mixture occasionally and observe for at least 10 minutes. Record any change in temperature.
5. Follow your teacher’s instructions for proper disposal of the materials.
6. Construct a graph of the change in temperature over time.

**Copper Chloride Lab Report Rubric**

**Lab: Observing A Chemical Reaction**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |
| --- | --- | --- |
| Table of Contents | Points Earned | Points Possible |
| Includes the title, page numbers, and date of experiment |  | 2 |
| Title |  |  |
| Creative, relates to the experiments, underlined at the top of the lab report |  | 1 |
| Problem Statement |  |  |
| Testable and clearly stated |  | 2 |
| Hypothesis |  |  |
| States what you are doing, what you predict will happen, and why you think that will happen. If…Then…Because |  | 2 |
| Materials |  |  |
| A list of all materials used in the experiment |  | 1 |
| Procedure |  |  |
| Write a complete, DETAILED procedure. |  | 2 |
| Data |  |  |
| Organized table that shows the data you have collected during the experiment* Include an appropriate title
* Clearly organize and label data columns and rows
* Units are clearly identified
* Accuracy of data is appropriate to measuring equipment or instruments
* Data from multiple trials is clearly shown
* Data and table lines are neat and presentable (USE A RULER)
 |  | 5 |
| Analysis/Conclusion |  |  |
| Graph of Temperature vs Time* Appropriate type of graph is used
* Include appropriate title for the graph
* Label both axes including units
* Scale for axes is appropriate for range of data
* Colors, symbols, labels, etc. are employed to make the graph easier to read. Key is included.
* Data are plotted accurately
* Graph is neat and presentable (USE A RULER)
 |  | 5 |
| Questions – answer the following question in complete sentences or write out the question.1. What type of changes did you see, physical or chemical? What is your evidence of this type of change?
2. What products do you think formed from this reaction, Aluminum + Copper chloride 🡪?
3. Is your hypothesis supported or rejected? Explain why using your data.
4. Discuss what you learned from this experiment and how it relates to what we are learning in class and applications in the real world (your world).
 |  | 5 |
| 3-Paragraph Conclusion (color-coded) |  | 10 |
| Total Points |  | 35 |

**Unit 1 Test Review**

**Matter**

*Complete the following questions on a separate piece of paper.*

**THIS IS AN ASSIGNMENT AND YOU GET CREDIT FOR COMPLETING IT!**

1. What is chemistry?
2. Describe matter? What are some examples of things that are not matter?
3. Name and describe the five branches of chemistry.
4. What is the difference between pure chemistry and applied chemistry?
5. Describe the difference between a scientific theory and a scientific law.
6. What should you always wear while doing a lab?
7. Is food or drink allowed in the classroom?
8. When clean up a lab, what are three things you should always do?
9. Draw/sketch the following pieces of equipment:
	1. Crucible
	2. Graduated Cylinder
	3. Ring stand
	4. Tweezers
	5. Tongs
	6. Beaker
	7. Erlenmeyer Flask
	8. Bunsen burner
	9. Ring
10. What is a hypothesis and how should a hypothesis be written in this class?
11. Define the following and give an example from a lab we have done:
	1. Independent variable
	2. Dependent variable
	3. Control
	4. Constants
12. What is a qualitative observation? Give an example.
13. What is a quantitative observation? Give an example.
14. What are the reasons for having more than one trial in an experiment?
15. What are the three main parts of a conclusion?
16. Define physical properties and give three examples.
17. Define chemical properties and give three examples.
18. What are the different phases of matter (how many are there?)?
19. Determine if the following are physical or chemical changes:
	1. grass growing
	2. baking a pie
	3. boiling water
	4. a banana turning brown
	5. mixing Kool-aid
20. What are the 5 observations that can be made to determine if a chemical reaction has taken place?
21. What is a chemical reaction?
22. In regards to the arrow (🡪), where are the reactants and products located?
23. What is the main difference between pure substances and mixtures?
24. Define the following and give an example:
25. Element
26. Compound
27. Heterogeneous mixture
28. Homogeneous mixture
29. Name and describe the different separation techniques.



