Unit 1

SI Units

Chemistry

Unit Exam: _____

Name: _____

Bethany High School – Chemistry Objectives
Unit 1 Objectives

Objective Number	Objective	Required Activities	Score (0-4)	Recommend Due Date	Date Completed
1	Students Conduct themselves in a safe manner in the lab	*Vodcast 1A *Safety Lab *Laboratory Safety Contract		8/21	
2	Distinguish between qualitative and quantitative observations & be able to use scientific notation.	*Vodcast 1B *Practice Problems 1.2		8/22	
3	Distinguish between precision and accuracy and learn how to count and round significant figures.	*Vodcast 1C *Practice Problems 1.3 * Uncertainty in Measurements Lab		8/24	
4	Utilize SI units and metric prefixes.	*Vodcast 1D *Practice Problems 1.4		8/27	
5	Make appropriate conversions when using metric prefixes and SI Units as well as make proper density and volume calculations.	*Vodcast 1D *Practice Problems 1.5 *Substance Separation Lab		8/29	
6	Distinguish between intensive and extensive and be able to discuss the properties of solids, liquids, and gases.	*Vodcast 1E *Practice Problems 1.6		8/31	
7	Distinguish between a chemical and physical change.	*Vodcast 1F *Practice Problems 1.7 *Calcium and Water Lab		9/4	
8	Describe elements, compounds, and mixtures.	*Vodcast 1F *Practice Problems 1.8		9/5	

Unit 1 Quizzes

Quiz Number	Objectives Covered	Score	Recommended Due Date	Date Completed
SI Units - #1	1.1		8/21	
SI Units - #2	1.2, 1.3		8/24	
SI Units - #3	1.4,1.5		8/29	
SI Units - #4	1.6,1.7, 1.8		9/5	

LAB SAFETY
Vodcast 1A Notes

- Proper steps must be followed for each lab we do to be a _____.
- Considerations:

Definitions:

- Room Layout:
    - Locations:

- Proper Dress:

- Behavior:

- Chemical Safety

- Accidents:

Watch Lab Safety Video and Take Notes/Make Fun of Forester:

VODCAST 1A REVIEW CHUNK

Directions: Complete the following "chunk" paragraph form about the vodcast.

- The topic sentence is the impression of the overall video (Do NOT begin with "I think" or "In the following".
- The concrete detail should be something you just learned from the vodcast; a fast/specific detail from the video.
- The commentary should be your thoughts or opinion, what the concrete detail means, what you did understand, or what you did not understand.

Topic Sentence: _____

_____

Concrete Detail: _____

_____

Commentary: _____

_____

Concrete Detail: _____

_____

Commentary: _____

_____

Concluding Sentence: _____

_____

SAFETY LAB

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 plastic 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			
H_2O			

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

For safety reasons, use a hot plate instead of an open flame any time you can. 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(°C)						

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.

Station 8 – Safety and Chemistry in the News

Procedure:

1. Read the following news article from the *Des Moines Register*.
2. Interpret #1 on the Frame Game puzzle.

Results and Conclusion: Describe all the safety violations in the article. Give the puzzle answer. For the conclusion, explain how this relates to your safety in the lab and how you can keep yourself safe.

Chemical swig severely burns man

By SARA TENNESSEN
REGISTER STAFF WRITER

Michael Villa of Des Moines would describe what happened to him as malicious. If he could talk.

Villa, 20, suffered severe burns when he mistakenly drank from a plastic bottle that a co-worker had filled with an industrial cleaner.

Police said the incident at Prime Plating Inc., 2250 Delaware Ave., on July 28 was a mistake, and said the co-worker had been trying to steal the liquid by hiding it in the bottle.

Villa lost his taste buds and three layers of skin from his mouth and throat, said his mother, Mary Villa, 45. She accuses the unnamed co-worker of trying to harm her son, who had started work at the plant a month ago.

"As far as I'm concerned, it's a total accident."

Rahn Bjornson, *police officer*

"It should never have occurred," she said.

Villa had set aside an empty Gatorade bottle and intended to fill it with drinking water, Mary Villa said. The unnamed co-worker instead filled the container with sodium hydroxide, a chemical used to clean zinc before it is applied to nuts and bolts.

Company president Fritz Stuedemann said the employee aborted the theft attempt, but left the bottle on a table outside the break room, where Villa found it and took a long drink.

Villa was rushed to the hospital by the plant manager. He is recovering at home.

Police Officer Rahn Bjornson said an investigation turned up no evidence of bad blood among employees, adding that Villa's co-worker admitted his plan to steal the sodium hydroxide, reportedly to use the high-strength cleaner for home projects.

"As far as I'm concerned, it's a total accident," Bjornson said.

Stuedemann said that the employee was punished, but that he considers Villa to be a victim of circumstance.

"From all the reports we got from everyone in the plant, that's what it looks like," he said. "There didn't appear to be a personal conflict. We obviously are very concerned for Mike."

FRAME GAMES

Can you solve these word games by our p
well-known saying, person, place or thing

1 ZEPbPbELIN

Station 9 – Bobby Bunsen's Baffling Inferno

Materials: Bunsen burner, thin wire, lighter

Procedure:

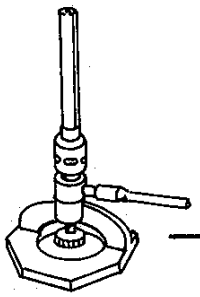
1. Connect the hose of the burner to the gas supply.
2. Ignite the lighter and hold it near the top of the burner while you partly open the valve on the gas supply.
3. The gas should ignite, if it doesn't open the valve fully.
4. If the flame is not blue in color and has a double cone, the amount of air and or gas will need to be adjusted.
5. To adjust the amount of air, turn either the tube or if it has a valve on the bottom turn it. An orange color indicates too much air.
6. If the flame is too tall, limit the gas using the gas valve.
7. Once you have a proper flame, test to see which part of the flame is the hottest by passing the wire through various parts of the flame. You will need to decide how you will know what the hottest part was.

Results and Conclusion: Draw a diagram of the flame and indicate where the hottest and coolest parts of the flame were. For the conclusion, explain how this relates to your safety in the lab and how you can keep yourself safe.

LABORATORY EQUIPMENT

Name _____

Label the lab equipment below.



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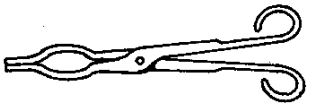

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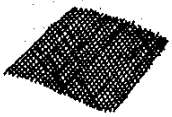

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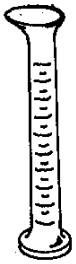

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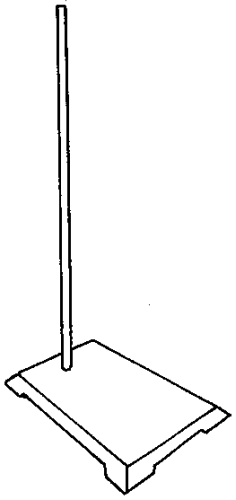

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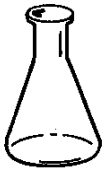

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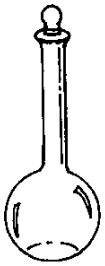

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_____

LABORATORY SAFETY CONTRACT

Your work in the science laboratory will occasionally involve the use of equipment and chemical reagents that have the potential of doing harm if they are not handled properly. In order to make your learning experience in the laboratory meaningful and safe, it is essential that you adhere to the following general safety rules at all times. Specific safety procedures will be given in each laboratory when they are needed; these may also be supplemented by your instructor.

- Wear safety goggles during all activities involving the use of caustic or corrosive chemicals and at any other time as directed by your instructor.
- Contact lenses may represent a hazard under certain circumstances. If this is the case, your instructor will inform you and require you to wear goggles specifically designed for people with contact lenses.
- Do not eat or drink in the laboratory. Never smell any chemical directly from the container. To smell a chemical, fan the vapors toward you with your hand.
- Wear closed toed shoes.
- Horseplay, practical jokes, and pranks are dangerous and prohibited.
- Immediately report any chemical or bacteriological spills to your instructor so that proper cleanup procedures may be carried out.
- Learn the location and proper use of all safety equipment: fire blanket, eyewash fountain, first aid kit, fire extinguisher, and fire alarm.
- Avoid wearing loose, baggy clothing in the laboratory. Tie back long hair and roll up long sleeves when working near ALL open flame or heat source.
- Treat all toxic and flammable chemical reagents with extreme care. Follow any specific instructions given by your instructor concerning the chemicals used in a particular laboratory activity.
- Dispose of used chemicals and solid waste in the proper container and according to your instructor's directions. Never handle broken glass yourself, immediately inform your instructor.
- Keep your area clean by wiping your work surface after use. Clean all equipment and return it to its proper place in the laboratory after use. Notify your instructor immediately of any accident, no matter how trivial it may seem.

Laboratory Safety Contract

I have read, understand, and agree to follow the safety procedures described on this page as well as any other written or verbal instruction provided by my instructor.

_____ _____

Student Name Period

_____ _____

Student Signature Parent/Guardian Signature

SCIENTIFIC NOTATION
Vodcast 1B Notes

Define the following terms:

- Matter –
- Mass –
- Volume –
- Qualitative Data –
- Quantitative Data –

Record the sample scientific notation problems below:

VODCAST 1B REVIEW CHUNK

Directions: Complete the following "chunk" paragraph form about the vodcast.

- The topic sentence is the impression of the overall video (Do NOT begin with "I think" or "In the following".
- The concrete detail should be something you just learned from the vodcast; a fast/specific detail from the video.
- The commentary should be your thoughts or opinion, what the concrete detail means, what you did understand, or what you did not understand.

Topic Sentence: _____

_____

Concrete Detail: _____

_____

Commentary: _____

_____

Concrete Detail: _____

_____

Commentary: _____

_____

Concluding Sentence: _____

_____

PRACTICE PROBLEMS 1.2

Convert the following numbers to Standard Scientific Notation.

1) 0.0023 _____
2) 471000 _____
3) 0.0124 _____
4) 0.000000000004 _____
5) 1374000000 _____
6) 2515000 _____
7) 0.0000010032 _____
8) 201400000000000 _____

Convert the following from Standard Scientific Notation to numerical form.

9) 1.37×10^{7} _____
10) 2.01×10^{-4} _____
11) 7.90×10^{-13} _____
12) 4.320×10^{6} _____
13) 3.002×10^{-7} _____
14) 4.98×10^{1} _____

Complete the following calculations. **DO NOT** *use a calculator.* **SHOW ALL YOUR WORK!!**

15) $4.35 \times 10^{-7} + 1.002 \times 10^{-8}$ _____
16) $7.002 \times 10^{5} + 1.3 \times 10^{3}$ _____
17) $2.9 \times 10^{6} \bullet 1.2 \times 10^{-3}$ _____
18) $9.3 \times 10^{-13} \div 3.1 \times 10^{4}$ _____
19) $1.002 \times 10^{2} - 7.10 \times 10^{3}$ _____
20) $8.00 \times 10^{7} \bullet 1.11 \times 10^{-5}$ _____
21) $4.21 \times 10^{12} \div 1.00 \times 10^{-4}$ _____
22) $3.0 \times 10^{32} - 4.51 \times 10^{29}$ _____

ACCURATE MEASUREMENT AND SIGNIFICANT FIGURES
Vodcast 1C Notes

- When reporting _____ measurements, the _____ number is always an _____.
- If you made a measurement with a meter stick in which the smallest measurements could have been in cm, could you report data of 22.46 cm? Answer the question in the space below and defend your answer in writing.

- What is the correct answer based on the vodcast? What did you do wrong if you answered incorrectly?

- If your answer comes out to be exactly _____ on the meter stick you should report it as _____ cm. This shows that you are _____ in your measurement.
- There can be no more _____ digits in the _____ than were in the _____ accurate value in the question.
- **Question:** What is the area of a room with the dimensions of 15.68 m and 12.459 m?

- What is the correct answer based on the vodcast? What did you do wrong if you answered incorrectly?
- _____ cylinders are used to measure _____ in labs.
- When reading a graduated cylinder always _____ from the _____ of the _____.
- The meniscus is the _____ in the _____ while in the cylinder.
- Draw a meniscus below:

- Notes on Temperature Scales:

VODCAST 1C REVIEW CHUNK

Directions: Complete the following "chunk" paragraph form about the vodcast.

- The topic sentence is the impression of the overall video (Do NOT begin with "I think" or "In the following".
- The concrete detail should be something you just learned from the vodcast; a fast/specific detail from the video.
- The commentary should be your thoughts or opinion, what the concrete detail means, what you did understand, or what you did not understand.

Topic Sentence: _____

_____

Concrete Detail: _____

_____

Commentary: _____

_____

Concrete Detail: _____

_____

Commentary: _____

_____

Concluding Sentence: _____

_____

PRACTICE PROBLEMS 1.3

1. Why is it incorrect to think that the more digits you represent in your answer, the more accurate it is?

2. What is wrong with this road sign: Memphis 7 mi (11.263 km)?

3. How many significant figures do each of the following numbers have:
    a. 214
    b. 81.60
    c. 7.03
    d. 0.03
    e. 0.0086
    f. 3236
    g. 8700

4. A recipe for soufflé specifies that the measured ingredients must be exact, or the soufflé will not rise. The recipe calls for 6 large eggs. The size of "large" eggs can vary by 10% according to the USDA. What does this tell you about how exactly you need to measure the other ingredients?

5. What is the sum of 2.59+3.001+1.4?

UNCERTAINTY IN MEASUREMENTS LAB

Complete the following with a partner. Go to each station and perform the measurements and answer the questions. Include units for each measurement!

Station #1 – Temperature (^{0}C)

1. Using the **digital** thermometer, record the room temperature (in Celsius…ALWAYS!) _____
   - What is the uncertainty digit in your measurement?

2. Using the **glass** thermometer, record the temperature of the water in the beaker. _____
   - How many certain digits are in your measurement?

Station #2 – Mass (g)

3. Using the **digital scale**, record the mass of object #1 (in grams…ALWAYS) _____
   - What is the uncertainty digit in your measurement?

4. Using the **three-beam balance**, record the mass of object #2. _____
   - How many certain digits are in your measurement?

Station #3 – Volume (mL)

5. Record the volume of water in the **beaker** (as accurately as your instrument will allow).

6. Record the volume of water in the **100 mL graduated cylinder**. _____

7. Record the volume of water in the **10 mL graduated cylinder**. _____

8. Which of the three instruments you used to record volume will allow you to have the most accurate measurement? Explain why.

Station #4 – Length (cm)

9. With the **ruler** (yes, leave the tape on it), measure the dimensions of an index card. (length and width)

10. With the **meter stick**, measure the dimensions of the chemistry textbook. (length, width, and depth)

Station #5 - Time

11. Using the **stop watch**, determine how accurately you can record time (ie, minutes, seconds, tenth of a second, etc). Explain why.

12. Using the classroom **clock**, determine how accurately you can record time. Explain why.

Additional Questions (review your notes if you're not sure)

13. Why is it important to include the right number of digits in a measurement?

14. What determines the uncertainty of a measurement?

SI UNITS AND METRIC PREFIXES
Vodcast 1D Notes

- Units are descriptive notes that accompany _____. All numbers must have _____ with them for observation to be useful.
- The _____ _____is the basic units of measurement throughout the world.
- The system is a _____ system. Each of the units are related by multiples of _____.
- Record the base SI unit for each major measurement below:

- Record the metric prefixes below based on the saying "King Henry Demands you Drink Chocolate Milk". Hint: You should be going from -3 to +3 on the prefix chart.

- Remember that _____ is the quantity of _____ in an object.
- _____ on the other hand is the measure of the force of _____ on an object.
- Density is the amount of _____ in each unit of _____.
- Write the formula for Density below as well as the unit it is measured in:

Answer the following example questions relating to metric conversions while showing ALL work:

- What is the volume of a rectangular solid 9 cm long, 4.5 cm wide, and 7 cm high?

- If a rock displaces 52 cm^3 of water and has a mass of 298 grams, what would its density be?

- How many milliliters are there in a 2 Liter bottle of soft drink?

- Which contains more mass, a 350 gram box or a 3.5 kilogram box.

VODCAST 1D REVIEW CHUNK

Directions: Complete the following "chunk" paragraph form about the vodcast.

- The topic sentence is the impression of the overall video (Do NOT begin with "I think" or "In the following".
- The concrete detail should be something you just learned from the vodcast; a fast/specific detail from the video.
- The commentary should be your thoughts or opinion, what the concrete detail means, what you did understand, or what you did not understand.

Topic Sentence: _____

_____

Concrete Detail: _____

_____

Commentary: _____

_____

Concrete Detail: _____

_____

Commentary: _____

_____

Concluding Sentence: _____

_____

PRACTICE PROBLEMS 1.4

1. What are the merits and drawbacks of using a person's foot as a standard? Consider both (a) a person's foot, and (b) any person's foot.

2. When traveling a highway in the mountains, you may see elevation signs that read "914 m (3000 ft)." Critics of the metric system claim that such numbers show the metric system is more complicated. How would you alter such signs to be more consistent with a switch to the metric system?

3. The sun, on average, is 93 million miles from Earth. How many meters is this? Express (a) using powers of ten, and (b) using a metric prefix.

4. Write the metric prefix for 1/1000.

5. What is the conversion factor between cm^2 and m^2?

6. Express the following numbers with a metric prefix.
    a. 4.54×10^3
    b. 7.181×10^7
    c. 3.33×10^{-7}
    d. 10.978×10^{-5}
    e. 8.112×10^{10}

PRACTICE PROBLEMS 1.5

1. Calculate the density of each of the following:
    a. 252 mL of a solution with a mass of 500. g

    b. 252 mL of a solution with a mass of 500 g

    c. A 6.75 g solid with a volume of 5.35 cm^3

    d. 50.0 mg of a gas which occupies a volume of 0.0064 L

    e. A substance with a mass of 7.55×10^4 kg and a volume of 9.50×10^3 L

2. Calculate the volume of each of the following:
    a. 26.5 g of a solution with a density of 7.48 g/mL

    b. A 3.400 kg solid with a density of 10.74 g/mL

11. _____ L = 50 mL
12. _____ mg = 2 kg
13. 500 cm^3 = _____ kg
14. 6 km = _____ cm
15. 6,000,000 mm = _____ km
16. _____ cm = 2.75 km
17. 455 cg = _____ g
18. 45 dm = _____ m
19. 3.5 hg = _____ g
20. 67 mm = _____ m

3. Calculate the mass of each of the following:
   a. A solid with a volume of 1.08 ft^3 and a density of 9.2 g/mL
   b. An 80 mL aliquot of a solution with a density of 5.80 g/cm^3
   c. A solid with a density of 2.65 g/mL and dimensions of 2.5 cm x 2.5 cm x 2.5 cm

Directions: Convert these measurements within the metric system. You can use the stair step diagram or whatever method is easiest for you.

1. 5 m = _____ cm
2. 5 m = _____ km
3. 25 cm = _____ mm
4. 25 cm = _____ m
5. 3000 mm = _____ m
6. 3000 mm = _____ km
7. 1000 g = _____ mg
8. 1000 g = _____ kg
9. _____ kg = 30,000 mg
10. _____ L = 5,000 mL

SUBSTANCE SEPARATION LAB

Materials (per table):

(1)	250mL beaker	(3)	Cups for collecting beads
(1)	400mL beaker filled with Dilute Salt	(1)	Stirring Rod
(1)	400mL beaker filled with Concentrated Salt	(1)	Plastic Spoon
(2)	Tablespoons of mixed beads		

Procedure:

1. In a 250mL beaker obtain 2 spoonfuls of the beads.
2. Add 100mL of tap water using the 100mL graduated cylinder at your table.
3. Stir the beads making sure that each of the beads is in contact with the water.
4. What beads appear to float on the surface?

5. Remove the floating beads and collect them in one of the cups provided.
6. Pour off the excess water into the sink. MAKE SURE NOT TO LOSE ANY BEADS
7. Add 100mL of the dilute salt mixture to the beaker.
8. Stir the beads making sure that each of them is in contact with the water.
9. What beads appear to float on the surface?

10. Remove the floating beads and collect them in one of the cups provided.
11. Pour off the excess dilute salt solution IN THE 400mL BEAKER AT YOUR TABLE.
12. Add 100mL of the Concentrated salt mixture to the beaker
13. Stir the beads making sure that each of them is in contact with the water.
14. What beads appear to float on the surface?

15. Pour off the excess Concentrated salt solution IN THE 400mL BEAKER AT YOUR TABLE.
16. Carefully store all the beads in one of the cups provided at the table
17. Clean up your lab station

Data Analysis:

1. List the correct order of bead removal from the beaker.

2. What 3 solutions were used to separate the beads?

3. What intensive property of the beads did the three solutions show about the beads?

4. What is this combination of beads called in chemistry?

5. We saw that this type of substance can be separated; can substances like this in chemistry be separated as well?

6. What are the two types of substances like this called in chemistry?

SOLIDS, LIQUIDS, AND GASES
Vodcast 1E Notes

- Matter on _____ can be found in these three phases.
- Water occurs in _____ form, ice in solid form, and vapor or steam in _____ form.
- Solids
  - Two characteristics of solids: definite _____ and definite _____.
  - Solids have a very low _____, as the particles are packed very _____ together.
- Liquids
  - Two characteristics of liquids: _____ volume and no definite _____.
  - The movement of particles is _____, but particles are still fairly _____ together.
- Gases
  - Two characteristics of gases: indefinite _____ and _____ shape
  - Particles are _____ apart and move at _____ speeds.

VODCAST 1E REVIEW CHUNK

Directions: Complete the following "chunk" paragraph form about the vodcast.

- The topic sentence is the impression of the overall video (Do NOT begin with "I think" or "In the following".
- The concrete detail should be something you just learned from the vodcast; a fast/specific detail from the video.
- The commentary should be your thoughts or opinion, what the concrete detail means, what you did understand, or what you did not understand.

Topic Sentence: _____

_____

Concrete Detail: _____

_____

Commentary: _____

_____

Concrete Detail: _____

_____

Commentary: _____

_____

Concluding Sentence: _____

_____

PRACTICE PROBLEMS 1.6

1. What are three common states of matter?

a. b. c.

2. Fill in the blanks in the following table:

State of Matter	Shape	Volume
Solid		
Liquid		
Gas		

3. Compare and contrast the arrangement of particles at the atomic level for a gas, a liquid and a solid.

4. What two things determine the shape and volume of a substance (solid, liquid or gas)?

CLASSIFICATION OF MATTER
Vodcast 1F Notes

- Physical Property – one that can be _____ and measured without a _____ in the kind of _____ being studied.
- Chemical Property – describes how matter will _____ and _____ in the presence of other kinds of _____.
- Small individual _____ that make up the universe are known as _____.
- An _____ is any substance that _____ be broken down into simpler _____.
- Each element has its own _____, one or two letters derived from the element's _____.
- Write below the elements you need to know before the quiz:
- _____ are _____ or more atoms of the same _____.
- _____ are _____ or more different types of _____ that are bonded.
- Is the following an element or a compound?
    - Sodium
    - Nickel
    - Water
    - Chlorine
    - Ammonia
    - Ammonium
    - Californium

- Characteristics of Mixtures
  - All mixtures are made up of _____ or more _____ substances.
  - The different parts of the mixture _____ their own _____.
  - The _____ of a mixture can be associated in any _____.
- Homogeneous Mixtures: This type of _____ appears to be the _____ throughout.
- Heterogeneous Mixtures: This occurs if the mixture has _____ appearances in its different _____.

VODCAST 1F REVIEW CHUNK

Directions: Complete the following "chunk" paragraph form about the vodcast.

- The topic sentence is the impression of the overall video (Do NOT begin with "I think" or "In the following".
- The concrete detail should be something you just learned from the vodcast; a fast/specific detail from the video.
- The commentary should be your thoughts or opinion, what the concrete detail means, what you did understand, or what you did not understand.

Topic Sentence: _____

_____

Concrete Detail: _____

_____

Commentary: _____

_____

Concrete Detail: _____

_____

Commentary: _____

_____

Concluding Sentence: _____

_____

PRACTICE PROBLEMS 1.7

Physical Change:

1) **Atoms do not rearrange** (switch partners).
2) Only physical properties change. Chemical properties do not change.
3) Physical changes are generally **easy to reverse**.
4) **No energy is produced** by the substance.

Chemical Change:

1) **Atoms are rearranged** into different molecules. There will be a new chemical formula.
2) Both **physical and chemical properties** are **changed**.
3) Changes are **not reversible** without another reaction.
4) **Energy** is often **produced** (fire or heat, for example).

Identify each of the following as a Physical or Chemical Change.
Put a **P** next to **Physical Changes** Put a **C** next to **Chemical Changes**

1. A piece of wood burns to form ash. _____
2. Water evaporates into steam. _____
3. A piece of cork is cut in half. _____
4. A bicycle chain rusts. _____
5. Food is digested in the stomach. _____
6. Water is absorbed by a paper towel. _____
7. Hydrochloric Acid reacts with zinc. _____
8. A piece of an apple rots on the ground. _____
9. A tire is inflated with air. _____
10. A plant turns sunlight, CO2, and water into sugar and oxygen. _____
11. Sugar dissolves in water. _____
12. Eggs turn into an omelette. _____
13. Milk sours. _____
14. A popsicle melts. _____
15. Turning brownie mix into brownies. _____

16)Classify each of the following as a physical or chemical property of water. Use “P” and “C”.

_____ colorless

_____ produces a gas when sodium metal is dropped into it

_____ changes from solid to liquid at $0^{o}C$

_____ decomposed by electricity into the elements hydrogen and oxygen

_____ condenses at $100^{o}C$

_____ produces acetylene gas when dropped on calcium carbide

17)Classify each of the following as a physical or chemical property of silicon. Use “P” and “C”.

_____ blue-gray color

_____ brittle

_____ insoluble in water

_____ melts at $1410^{o}C$

_____ reacts with fluorine

_____ shiny

18)Classify each of the following as a physical or chemical change. Use “P” or “C”.

_____ bending a piece of wire

_____ tearing a piece of paper

_____ cooking a steak

_____ dissolving sugar in water

_____ souring of milk

_____ having iron rust

_____ burning magnesium in air

_____ oil is pumped into a pipeline

_____ water boils

_____ a snowflake melts

CALCIUM AND WATER LAB

Pre-Lab Questions:

1. What are some characteristics of a metal?

2. Discuss what you know about calcium. What is it? What does it look like? Where is it found?

3. What type of mixture will calcium and water produce?

Materials:

(1) 50, 100, 250, or 400 mL beaker or Erlenmeyer Flask
(1-2) Calcium Metal Chips
(1) Watch Glass
(1) Bottle of Litmus Paper (Red and Blue)
(1) Heating Apparatus

Procedure:

1. Obtain goggles
2. Obtain a piece of tape and write your group members names on the beaker
3. Weigh the beaker and the Watch Glass 2 times:

Mass 1: _____

Mass 2: _____

Mass of glassware and watch glass: _____

4. Add 1 to 2 pieces of Calcium Metal to the beaker, replace the watch glass, and reweigh the system twice

Mass 1: _____

Mass 2: _____

Average Mass of System: _____

5. Calculate the weight of the Calcium Metal from the averages:

   Mass of Calcium Metal: _____

6. Add 25mL of distilled water to the beaker containing the Calcium

7. Record your observations:

   _____

   _____

   _____

8. Test the liquid for **Litmus Paper Color using tweezers**

   Results:

   Litmus Paper: Red: _____ Blue: _____

9. Heat the calcium system strongly over the Bunsen burner until it is completely dry.

10. Remove from heat **WITH TONGS** and allow too dry.

11. After the system is cooled to room temp, weigh the system and record the weights

    Mass 1: _____

    Mass 2: _____

    Mass 3: _____

    Average: _____

12. Determine the weights of the substance remaining in the beaker:
    a. Show your work!!!

13. Calculate the percentage weight change for the system. Make sure to label all values

$$\% \text{ weight change} = \frac{final weight - initial weight}{initial weight} \bullet 100$$

PRACTICE PROBLEMS 1.8

1) Identify the following as a mixture (M), element (E), or a compound (C). If they are a mixture, classify as: homogeneous or heterogeneous. Justify your answer.

_____ silver

_____ soft drink

_____ fog

_____ ink

_____ egg

_____ ice

_____ magnesium

_____ air

_____ blood

_____ river water

_____ glass

_____ salt

_____ sugar

_____ chocolate cookie