

Benchmark Study Guide: Complete the following guide to help prepare for the benchmark on October 27.

This is not everything that may be on the test but it is a guide to help you study. Use your notebooks (warm ups, EQ's, and notes) and your feathers as tools to study with as well.

1. Define atom, element, molecule, and compound.

2. Place the above words in order from most complex to least complex. Explain your reasoning.

3. Draw a representation of each of the following.



Atom



Element



Molecule



Compound

S8P1b Pure Substances and Mixtures

4. Define pure substance, homogeneous mixture (solution) and heterogeneous mixture

5. Draw a representation of each of the following.



Pure Substance
(Elements)



Pure Substance
(Compounds)

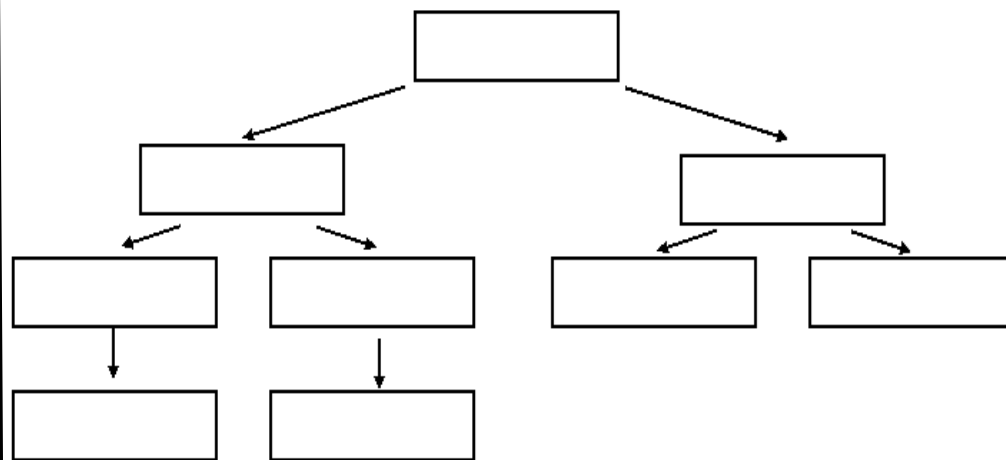


Homogeneous
Mixture



Heterogeneous
Mixture

6. Place the terms atoms, compounds, elements, homogeneous mixture, heterogeneous mixture, matter, mixture, molecules, and pure substance in the chart below. (Read question 7 before filling in the chart.)



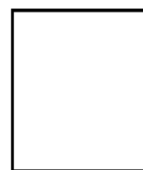
7. In a separate color place an example of each to the right of each box.

S8P1c Phases of Matter

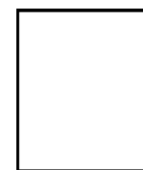
8. What state of matter has the highest energy? Lowest?

9. What state of matter has the highest density? Lowest?

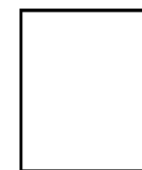
10. Show the molecules of solids, liquids, and gases. Use arrows to show their relative energy level.



Solid



Liquid



Gas

11. To the side of each state of matter list if it has definite or indefinite shape and volume.

SSP1d Physical and Chemical Properties

12. List 8 examples of physical properties.

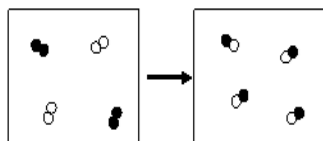
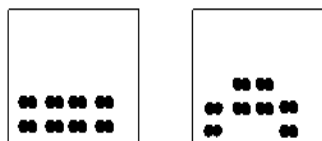
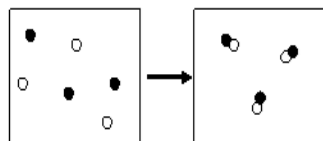
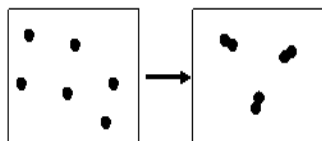
- | | |
|----|----|
| 1. | 5. |
| 2. | 6. |
| 3. | 7. |
| 4. | 8. |

13. List 3 examples of chemical changes. What happens to the molecules (or elements) after the change?

- 1.
- 2.
- 3.

14. Why are volume, mass, and length *not* properties. Give an example.

15. Label these as Physical or Chemical changes. Explain why.



16. If an object with a mass of 12 g has a volume of 6.0 cm³. What is its density? ($D = m/V$)

17. The data to the right was found in a student's notebook. Calculate the density.

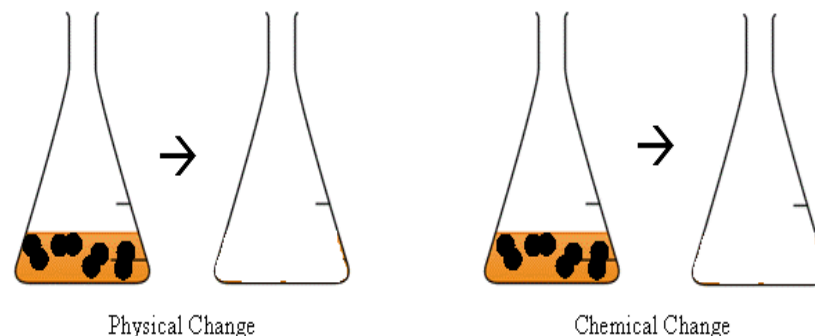
Mass of a metal	40.0 g
Volume of water <u>before</u> the sample was added	13.0 ml
Volume of water <u>after</u> the sample was added	18.0 ml
Volume of Object	
Density	

SSP1e Physical and Chemical Changes

18. What evidence suggests a chemical change? If those changes occur must there have been a chemical change?

19. Define precipitate, exothermic, and endothermic.

20. Below are two Erlenmeyer flasks. A liquid has been placed in both. Both have heat applied to them. In the first a physical change occurs and in the second a chemical change occurs. Draw a representation of this event.



21. Explain the difference to the right of each flask.

SSP1g Conservation of Matter:

22. Define the Law of Conservation of Matter

23. What must be balanced in a reaction?

Number of Atoms? _____	Number of Molecules? _____
Amount of Mass? _____	Number of Substances? _____

24. When a spark is set off in a mixture of hydrogen gas and oxygen gas water is formed. If the reaction runs completely, all gas turns to water vapor, how many grams of water will you have if you begin with 4 grams of hydrogen and 32 grams of oxygen? _____

25. Complete the reaction: 36 grams of H₂O mix with pure Na to form 80 grams of NaOH and 2 grams of H₂. With how much Sodium must you start? _____

Determine whether the following statements are true or false. If the state is false, make the statement true by correcting the underlined word.

25. ___ Temperature enables you to float a needle on water.
26. ___ During the freezing process particles lose energy.
27. ___ Sublimation is the process that helps to form clouds.
28. ___ Particles that make up matter are in constant motion.
28. ___ A gas will partially fill its container.
29. ___ The particles remain constant when a liquid reaches its boiling point.
30. ___ The higher the temperature the faster particles move.
31. ___ Condensation is the process by which particles move slowly enough for their attraction to bring them together to form a droplet of liquid.
32. ___ If a substance reacts with HCl, this would be an example of a physical property.
33. ___ Reactivity is an example of a chemical property.
34. ___ When a compound is formed a chemical reaction has taken place.
35. ___ Acids are slippery and have a bitter taste.
36. ___ Salt water is an example of a chemical change.
37. ___ Bases have a sharp smell and sour taste.
38. ___ The pH level of an acid is between 0 and 7.
39. ___ The pH level of a base is between 0 and 7.
40. ___ Neutral substances have a pH of 0.
41. ___ The ability to burn is a chemical property.
42. ___ A precipitate is a solid that forms from a chemical reaction that takes place in a solution.
43. ___ The boiling point is the temperature at which some of the liquid begins to enter the gaseous state.
44. ___ Changes of states of matter are examples of chemical properties.
45. ___ Combustion reaction is a chemical reaction that occurs when oxygen combines with another substance.

Identify each item as acidic or basic by writing A or B.

46. ___ ammonia
47. ___ shampoo
48. ___ bleach
49. ___ apples
50. ___ tea
51. ___ vinegar
52. ___ tomato

Properties of Acids and Bases

◆ Acids

- ◆ turn blue litmus red
- ◆ taste sour
- ◆ Acids corrode metals
- ◆ positively charged hydrogen ions (H^+)

◆ Bases

- ◆ turn red litmus blue
- ◆ taste bitter
- ◆ Negatively charged hydroxide ions (OH^-)
- ◆ Feel slippery
- ◆ Most hand soaps and drain cleaners are bases
- ◆ Strong bases are caustic

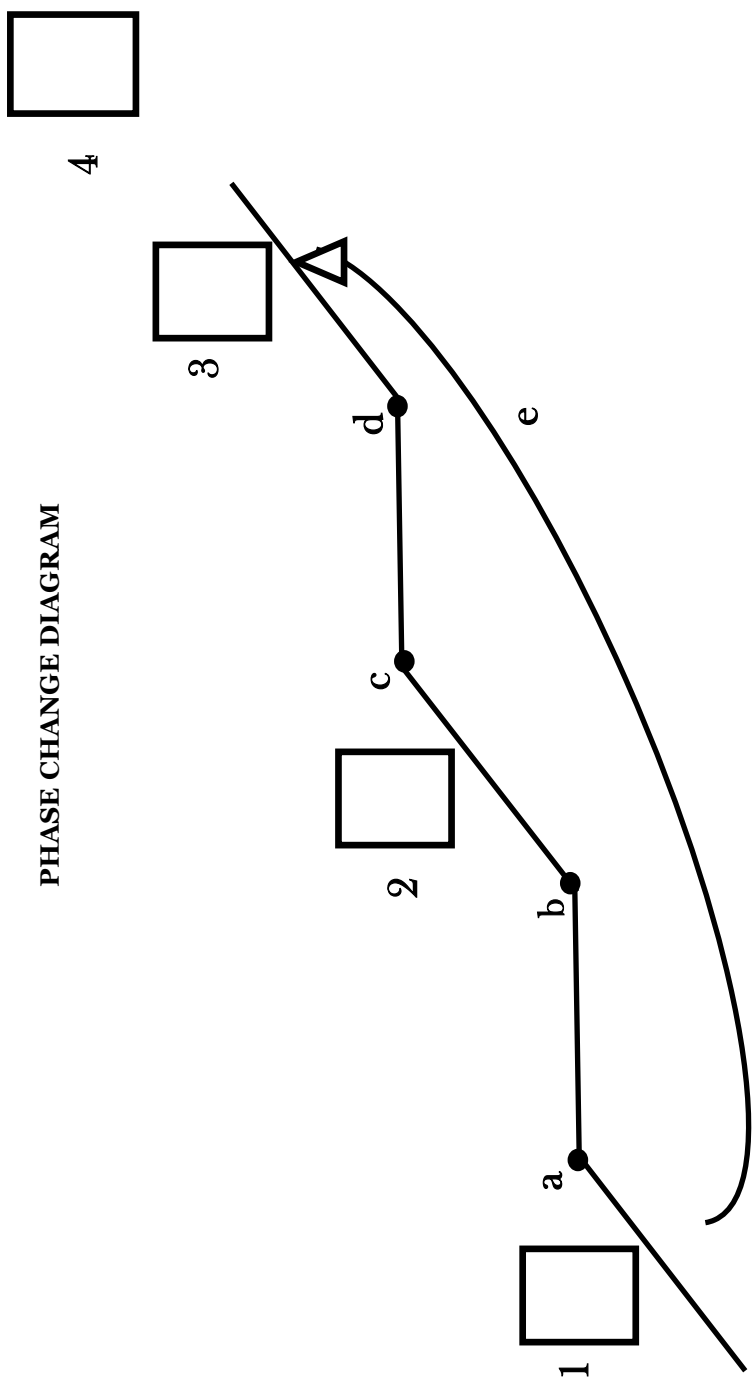
The pH Scale



Identify each change as chemical or physical by writing C or P.

53. ___ a burning log
54. ___ food being digested
55. ___ rust
56. ___ a rotting pile of leaves
57. ___ a log chopped for firewood
58. ___ leaves falling from a tree
59. ___ crushing a graham cracker
60. ___ chocolate melting

PHASE CHANGE DIAGRAM



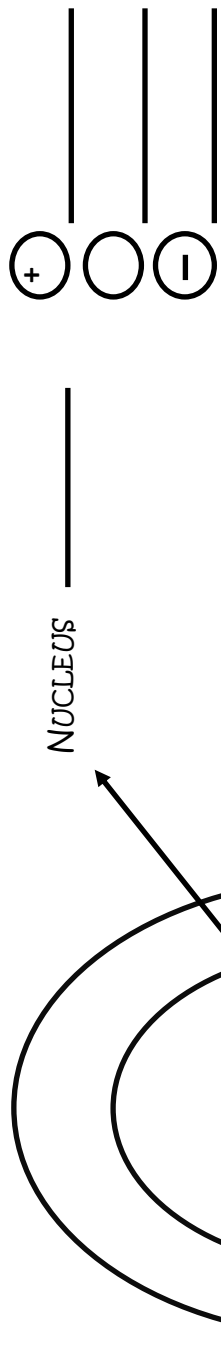
Label the phase of matter. (#'s)

Draw the particle alignment for each phase of matter in it's corresponding box.

Label the points of phase change, Explain how the sets (a and b/ c and d) connect.

Explain e and why it is different from other points of change. Give an example of when it happens.

Label the Atom below. Fill in the blanks on critical information.



ATOM REVIEW

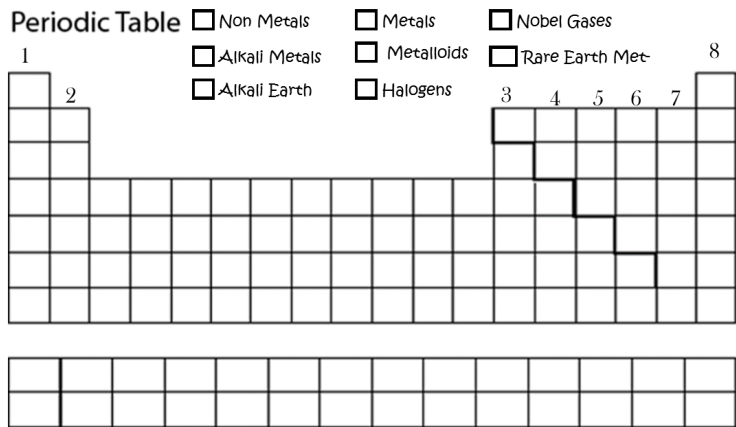
The atomic # is _____ and _____

The atomic mass is _____

How Can you determine the # of neutrons in an atom? _____

An atoms Charge is always _____

Because _____

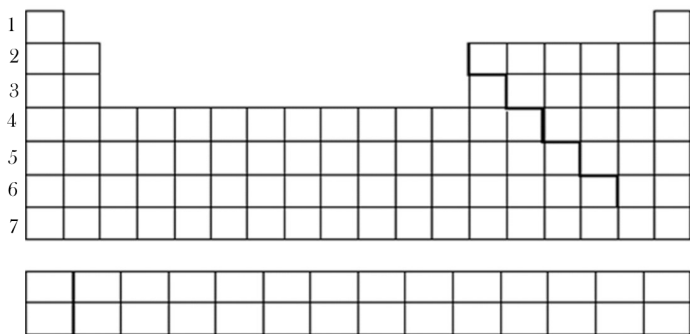


Columns = Groups or Families

Rows = Periods

Explain the arrangement of Periodic Groups: _____

Periodic Table



Columns = Groups or Families

Rows = Periods

Explain the arrangement of Periods: _____

The table sorts elements by atomic number. The number _____ from left to right.

The lightest elements are in the upper _____ of the table while the heaviest are in the bottom _____ of the table.

1. What patterns can you notice in the periodic table?

2. How are the atomic numbers arranged? _____

3. How does reactivity correlate to elemental arrangement? _____

4. What are the four main ways elements are arranged in the periodic table?

5. What are metalloids?

6. Explain the difference in the atomic number and the atomic mass. BE specific.

Using your periodic table from your notebooks fill in the missing information below:

Element	Symbol	Atomic #	Protons	Neutrons	Electrons	Mass #
1.	Ag	47	2.	61	47	108
Potassium	3.	19	4.	20	19	39
5.	Sn	6.	50	69	50	119
Fluorine	F	9	9	7.	8.	19
Krypton	9.	36	36	48	36	10.

Using the periodic table fill in the missing information about each element. Then draw a Bohr model expressing the information that you found.

___	P = ___
Na	E = ___
___	N = ___

Bohr Model:

___	P = ___
Al	E = ___
___	N = ___

Bohr Model:

7	P = ___
___	E = ___
___	N = ___

Bohr Model:

___	P = ___
Silicon	E = ___
___	N = ___

Bohr Model:

2	P = ___
___	E = ___
___	N = ___

Bohr Model:

___	P = ___
Ar	E = ___
___	N = ___

Bohr Model:

Create an illustration and explain each particle below.

ATOM

Molecule

Compound

Using the Bohr models below show how elements from different groups form bonds. Explain below each model why this pair works.

