

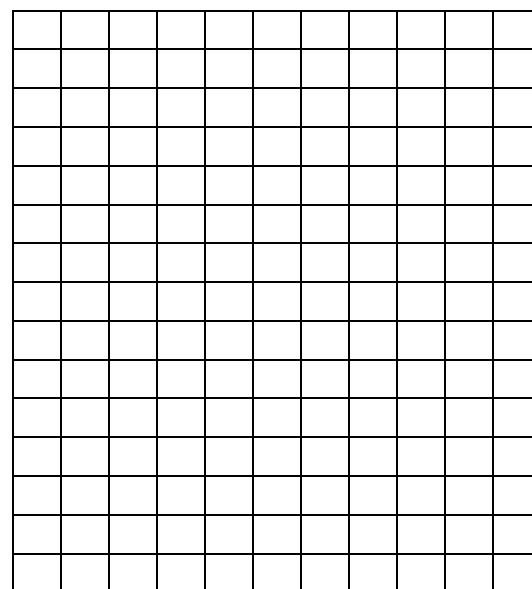
Chemistry

Semester I Final Exam Study Guide

Chapter 1&2: Scientific Method & Matter and Energy

1. Graph the data.

Class	Hours Studied	Average grade
1	1.00	70%
2	1.50	73%
3/4	3.25	83%
5/6	2.75	80%
9/10	2.00	76%



2. Determine the independent and dependent variable

3. List and define the activities of the scientific method.

4. What is a controlled experiment?

5. State the law of conservation of energy.

6. State the law of conservation of mass.

7. Use measurements in an equation and report the correct number of significant digits.

a. Multiplication/Division rule

b. Addition/Subtraction rule

a) $100 \text{ g} \div 50.0 \text{ mL} =$ _____

h) $200 \text{ mL} - 45 \text{ mL} =$ _____

b) $650 \text{ L} - 9.7 \text{ L} =$ _____

i) $150.00 \text{ s} \times 10.000 \text{ m/s} =$ _____

c) $540 \text{ mL} \times 2.5 \text{ g/mL} =$ _____

j) $10.6 \text{ g} + 21.04 \text{ g} =$ _____

d) $645.5 \text{ mL} + 2531 \text{ mL} =$ _____

k) $120 \text{ Joule} \div 60.0 \text{ g} =$ _____

e) $325 \text{ m} + 1000 \text{ m} =$ _____

l) $5.001 \times 10^{14} \text{ mg} + 6.0605 \times 10^{16} \text{ mg} =$

f) $12 \text{ cm} + 10 \text{ cm} =$ _____

m) $101.27 \text{ m} - 96 \text{ m} =$ _____

g) $25.00 \text{ m} \div 1050 \text{ s} =$ _____

8. Express the following in scientific notation and write as a measurement with a prefix.

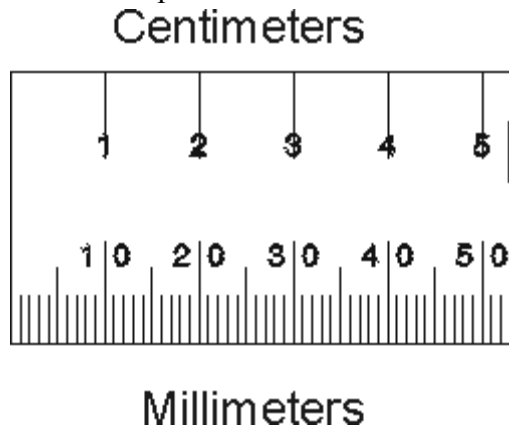
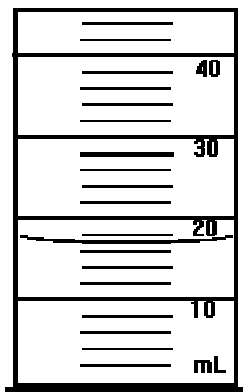
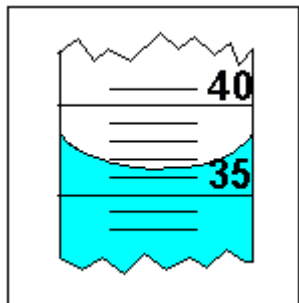
Example	Scientific Notation	Measurement with Prefix
a) 0.00345 m	_____	_____
b) 7805.09 g	_____	_____
c) 0.08640 m	_____	_____
d) 2500000 L	_____	_____
e) 0.0000090 s	_____	_____

9. Give an example of a data set with 4 measurements for the mass of an object:

	True Value	Data set
Accurate and precise		
Inaccurate and precise		

10. What are the two requirements for something to be considered matter?

11. What is the volume in the graduated cylinders? What is the precision of the metric ruler in mm?



12. For the following states determine if the volume and shape are definite or variable.

Phase	Volume	Shape
Solid		
Liquid		
Gas		

13. What is the difference between a mixture and a pure substance? Give an example of each.

14. What is the difference between a chemical change and a physical change? Give an example of each.

15. What is the difference between temperature and heat?

Chapter 3: Atomic Structure

16. Where is the majority of the mass found in the atom? What occupies the majority of the volume?

17. Fill in the following table with the information about the subatomic particles.

Particle	Charge	Relative Mass (amu)	Location
Proton			
Neutron			
Electron			

18. Which wave has a higher frequency?

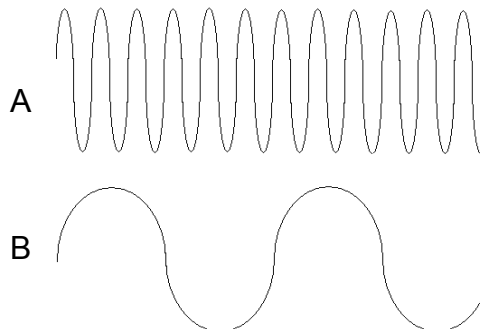
Circle one: A B or Neither

Which wave has a longer wavelength?

Circle one: A B or Neither

Which wave has a faster speed in a vacuum?

Circle one: A B or Neither



19. What is the relationship between wavelength and frequency? What is the formula that shows this relationship?

20. In the following table indicate the number of subatomic particles for each isotope.

Isotope	# of protons	# of electrons	# of neutrons
Uranium- 238			
Uranium- 235			
Chlorine- 35			
Chlorine- 36			

21. How are isotopes of the same element similar and how are they different?

22. Write the electron configuration, the noble gas configuration, and draw the orbital diagram for the following:

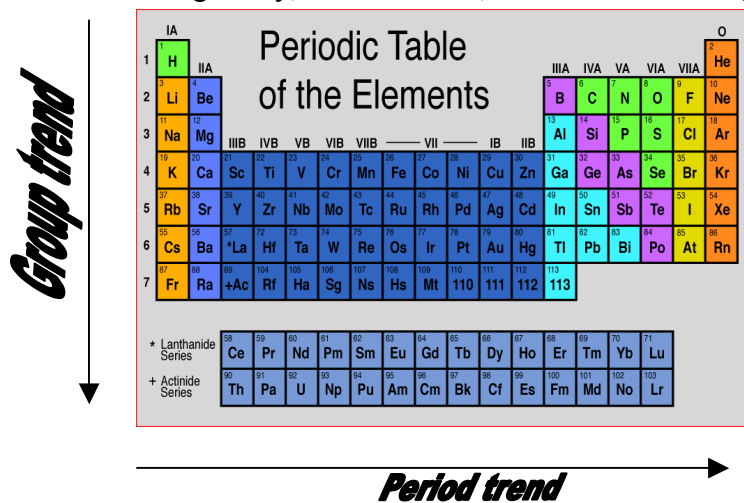
Calcium

Sulfur

Chapter 4: The Periodic Table

23. State increase or decrease to indicate the following trends in the table.

Electronegativity, atomic radius, and ionization energy



Property	Group trend	Period trend
Atomic radius		
Ionization energy		
Electronegativity		

24. Place the following elements in order of decreasing electronegativity: As, S, F, Sn

25. List the properties of

- a. metals
- b. metalloids
- c. nonmetals

26. Complete the table

Group number	Group name	# of valence electrons	List three properties
1			
2			
3-12			
17			
18			

27. Complete the table

Atomic number	Where/When the element(s) were made
1	
2-92	
93-118	

28. How many molecules are in 1 mol of everything?

29. Convert 25.0 g CO₂ to molecules.

Chapter 5: Ionic Compounds

30. Why do elements combine to form compounds?

31. By looking at the formula how can you tell if it is ionic or covalent?

32. Ionic bonds are the (strongest/weakest) attractions between _____ charged particles.

Chapter 6: Covalent Compound

33. Using the electronegativity of two elements determine the bond type.

- a. H-O _____
- b. Cs-Cl _____
- c. I-Br _____

34. Account for the differences between the melting points of:

- a. Ionic compounds

- b. Polar covalent compounds

- c. Non-polar covalent compounds

35. What is the VSEPR theory? What does it help us predict?

36. List the different type of intermolecular forces from strongest to weakest.

37. Name or give the formula for the following compounds

- a. N_2O_5 _____
- b. $CuClO_3$ _____
- c. Diarsenic trisulfide _____
- d. Carbon tetrachloride _____
- e. Sodium fluoride _____
- f. Chromium (III) oxalate _____

38. For the following covalent compounds, give the Lewis structure, the molecular shape, and determine if it is polar or non-polar.

	NH₃
Lewis Structure	
Molecular Shape	
Polar or Non-polar	