

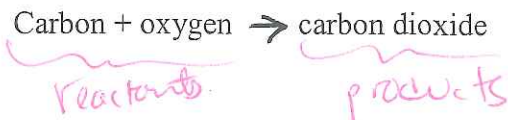
Chapter 1 and 2 Summary
CP/Honors Chemistry

Name: Key

Using Chapter 1 and 2 of your textbook and your notes, answer the following questions.

- What type of chemistry is concerned with:
 - Identifying the composition of materials. *analytical*
 - The relationships between energy and matter. *physical*
 - The study of the processes occurring in living things. *biochem*
- Give an example of basic research, applied research, and technological development.
↓ investigating properties of substances | *↓ curing cancer* | *↓ improving cell phones*
- Describe the difference between mass and weight.
↳ grav. force acting on object
↳ amt of matter in object
- What is an atom? *Smallest unit of an element that maintains the chemical identity of that element.*
- How is an element different from a compound?
element contains only 1 type of atom.
compound contains more than 1 type.
- What is the difference between an extensive and an intensive property? Give an example of each.
↳ does rely on amt mass *↳ does not rely on amt density*
- Are the following physical or chemical changes?
 - Melting butter *phys*
 - Cooking an egg *chem*
 - Boiling water *phys*
 - Dissolving sugar in water *phys*
 - Decomposing vegetables *chem*

8. Label the reactants and products in the chemical reaction below:



9. Describe the difference between a homogeneous mixture and a heterogeneous mixture.

↑
components
equally
distributed

↑
Not equally
distributed

10. On the periodic table, what is a group? What is a period?

column row

11. Which element is found in group 13, period 3?

Aluminum

12. Compare the properties of a metal and a nonmetal using the table below.

	Metals	Nonmetals
Appearance	shiny	dull
conductivity	good	poor
Response to being hit by a hammer	flatten	shatter
Position on periodic table	on left of staircase	on right of staircase

13. What is a metalloid? Where are they found on the periodic table?

↳ props of both metals + nonmetals

14. What is a noble gas? Where are they found on the periodic table?

↳ inert gas

Gr 18

15. How many kilometers is equivalent to 45.5 meters?

$$45.5 \text{ m} \times \frac{1 \text{ km}}{1000 \text{ m}} = 0.0455 \text{ km}$$

16. How many milliliters is equivalent to 0.89 L?

$$0.89 \text{ L} \times \frac{1000 \text{ mL}}{1 \text{ L}} = 890 \text{ mL}$$

17. Using dimensional analysis, how many seconds are in 4.00 days?

$$4.00 \text{ days} \times \frac{24 \text{ hr}}{1 \text{ day}} \times \frac{3600 \text{ s}}{1 \text{ hr}} = 3.46 \times 10^5 \text{ s}$$

18. Identify which type of quantity each measurement represents. How many sig figs in each of the following numbers?

a. 0.00340 g mass 3

b. 5.9 L volume 2

c. 80000 J heat 1

d. 345 s time 3

19. Describe the difference between precision and accuracy.

↳ reproducibility

↳ closeness to actual value

20. Solve the following problems. Express your answers to the proper number of sig figs.

a. $9.0 \text{ g} + 6.08 \text{ g} = 15.1 \text{ g}$

b. $4.5 \text{ g} / 3.22 \text{ mL} = 1.4 \text{ g/mL}$

c. $5.75 \text{ cm} \times 3.20 \text{ cm} \times 0.75 \text{ cm} = 14 \text{ cm}^3$

d. $4.007 \text{ mL} - 0.9 \text{ mL} = 3.1 \text{ mL}$

21. Express each of the following numbers in scientific notation:

a. $0.00056 = 5.6 \times 10^{-4}$

b. $75,000,000 = 7.5 \times 10^7$

22. Describe the rule about how many digits you should record when using a measuring instrument.

Record all digits w/a "tic" mark, then estimate one more digit.

SHORT ANSWER Answer the following questions in the space provided.

1. A horizontal row of elements in the periodic table is called a(n) period
2. The symbol for the element in Period 2, Group 13, is boron
3. Elements that are good conductors of heat and electricity are metals
4. Elements that are poor conductors of heat and electricity are nonmetals
5. A vertical column of elements in the periodic table is called a(n) group
6. The ability of a substance to be hammered or rolled into thin sheets is called malleability
7. Is an element that is soft and easy to cut cleanly with a knife likely to be a metal or a nonmetal? metal
8. The elements in Group 18, which are generally unreactive, are called noble gases
9. At room temperature, most metals are solids
10. Name three characteristics of most nonmetals.
brittle, dull (lack luster), nonconductive
11. Name three characteristics of metals.
malleable + ductile, shiny (lustrous), conductive

CHAPTER 2 REVIEW*Measurements and Calculations***MIXED REVIEW****SHORT ANSWER** Answer the following questions in the space provided.

1. Match the description on the right to the most appropriate quantity on the left.

- | | |
|------------------------------|--|
| <u>d</u> 2 m ³ | (a) mass of a small paper clip |
| <u>a</u> 0.5 g | (b) length of a small paper clip |
| <u>f</u> 0.5 kg | (c) length of a stretch limousine |
| <u>e</u> 600 cm ² | (d) volume of a refrigerator compartment |
| <u>b</u> 20 mm | (e) surface area of the cover of this workbook |
| | (f) mass of a jar of peanut butter |

2. a A measured quantity is said to have good accuracy if

- (a) it agrees closely with the accepted value.
 (b) repeated measurements agree closely.
 (c) it has a small number of significant figures.
 (d) all digits in the value are significant.

3. A certain sample with a mass of 4.00 g is found to have a volume of 7.0 mL. To calculate the density of the sample, a student entered $4.00 \div 7.0$ on a calculator. The calculator display shows the answer as 0.571429.

- yes _____ a. Is the setup for calculating density correct?
2 _____ b. How many significant figures should the answer contain?

4. It was shown in the text that in a value such as 4000 g, the precision of the number is uncertain. The zeros may or may not be significant.

- 1 _____ a. Suppose that the mass was determined to be 4000 g. How many significant figures are present in this measurement?
 4.0×10^3 _____ b. Suppose you are told that the mass lies somewhere between 3950 and 4050 g. Use scientific notation to report the value, showing an appropriate number of significant figures.

5. If you divide a sample's mass by its density, what are the resulting units?

Volume (mL)

D REVIEW continued

6. Three students were asked to determine the volume of a liquid by a method of their choosing. Each performed three trials. The table below shows the results. The actual volume of the liquid is 24.8 mL.

	Trial 1 (mL)	Trial 2 (mL)	Trial 3 (mL)	
Student A	24.8	24.8	24.4	24.7
Student B	24.2	24.3	24.3	24.3
Student C	24.6	24.8	25.0	24.8

- C a. Considering the average of all three trials, which student's measurements show the greatest accuracy?
- B b. Which student's measurements show the greatest precision?

PROBLEMS Write the answer on the line to the left. Show all your work in the space provided.

7. 195 g A single atom of platinum has a mass of 3.25×10^{-22} g. What is the mass of 6.0×10^{23} platinum atoms?

$$6.0 \times 10^{23} \text{ atoms} \times \frac{3.25 \times 10^{-22} \text{ g}}{1 \text{ atom}} =$$

8. A sample thought to be pure lead occupies a volume of 15.0 mL and has a mass of 160.0 g.

10.7 g/mL a. Determine its density.

$$D = \frac{160.0 \text{ g}}{15.0 \text{ mL}}$$

No. Probably Not. b. Is the sample pure lead? (Refer to Table 4 on page 38 of the text.)

5.7% c. Determine the percentage error, based on the accepted value for the density of lead.

$$\frac{|10.7 - 11.35|}{11.35} \times 100$$