

Revised August 2011



HONORS WORKSHEET 1s: Matter & Measurement Summary



1. Classify each of the following as either, an **element**, a **compound** or a **mixture**. If you classify something as a mixture then **also** state whether it is a **homogeneous** or a **heterogeneous** mixture. (10)
 - (a) Helium
 - (b) Nitrogen
 - (c) Pure water
 - (d) Pure table salt (sodium chloride)
 - (e) Flat (un-carbonated) Coca-Cola
 - (f) Air
 - (g) Fruit cake
2. Classify the following as either **chemical** or **physical** changes. (3)
 - (a) Ice melting
 - (b) Gasoline burning
 - (c) Evaporation of perfume from an open bottle
3. Mercury is a liquid metal that has a density of 13.58 g/mL. Calculate the volume of mercury that must be poured out in order to obtain 0.5000 g of Mercury. (2)
4. Classify the following as either **quantitative** or **qualitative** observations. (4)
 - (a) My eyes are brown
 - (b) My neck size is 17 inches
 - (c) My average grade last year was 79%
 - (d) Physics is a difficult subject

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5. Give an example of a natural law (other than the law of conservation of mass). (1)

6. Convert these numbers to scientific notation. (2)

(a) 3580000000000

(b) 0.0000000821

7. Round the following numbers to four figures. (6)

(a) 2.16347×10^5

(b) 4.000574×10^6

(c) 3.682417

(d) 7.2518

(e) 375.6523

(f) 21.860051

8. Perform the following conversions. (5)

(a) 0.75 kg to milligrams

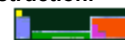
(b) 1500 millimeters to km

(c) 2390 g to kg

(d) 0.52 km to meters

(e) 65 kg to g

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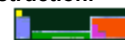
9. Complete the following table of temperatures, performing the appropriate conversions. (18)

Kelvin	Fahrenheit	Celsius
200.		
23.0		
0.000		
	180.	
		45.0
500.		
	350.	
		97.0
		30.0

10. An experiment is performed in which the molar mass of a gas is found to be 48.45 g mol^{-1} .
The published (actual) value is 52.98 g mol^{-1} . Calculate the percentage error. (2)

11. Distinguish carefully between precision and accuracy. (2)

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12. How much heat (energy) is required to convert 18.0 g (1.00 mole) of ice at -5.00°C to steam at a temperature 111°C ? (6)

Data:

- Specific heat capacity of ice = $2.05 \text{ Jg}^{-1}\text{K}^{-1}$
- Specific heat capacity of water = $4.18 \text{ Jg}^{-1}\text{K}^{-1}$
- Specific heat capacity of steam = $2.08 \text{ Jg}^{-1}\text{K}^{-1}$
- Molar heat of fusion for H_2O = 6.02 kJ mol^{-1}
- Molar heat of vaporization of H_2O = 40.7 kJ mol^{-1}
- Boiling Point of H_2O = $100. ^{\circ}\text{C}$
- Freezing Point of H_2O = $0.00 ^{\circ}\text{C}$