WLHS / Conc. Chem. / Monson

Name_____Date_____Per_____

WORKSHEET: Density Calculations!

DENSITY = $\frac{\text{mass}}{\text{volume}}$	**UNITS OF DENSITY** g/cm^3 OR g/mL

PROBLEMS: SHOW ALL WORK (equation, substitute, answer), & include appropriate units at all times!

EXAMPLE: A block of aluminum occupies a volume of 15.0 mL and has a mass of 40.5 g. What is its density?

EQUATION: D = mass / volume

ANSWER: (with units!)

SUBSTITUTE: D = 40.5 g / 15.0 cm^3 = 2.7 g/cm^3

1) Mercury metal (a liquid!) is poured into a graduated cylinder to a volume of 22.5 mL. The mass of the mercury is 306.0 g. From this information, calculate the density of mercury.

EQUATION:_____ **ANSWER: (with units!)**

SUBSTITUTE:_____ =

2) What is the density of silver metal, if the mass of a piece of silver is 2500.0 g, and the volume is 238.1 mL?

EQUATION:_____ **ANSWER: (with units!)**

SUBSTITUTE:_____ =

3) Benzene is a liquid. A sample of benzene has a volume of 250.0 mL. If the mass of this benzene is 219.125 g, what is the density of benzene?

EQUATION:_____ **ANSWER: (with units!)**

SUBSTITUTE:_____ =

4) A rectangular block of copper metal weighs 1896 g. The dimensions of the block are 8.4 cm by 5.5 cm by 4.6 cm. From this data, what is the density of copper? (HINT: find the volume of a block first)

EQUATION & CALCULATION for VOLUME:_____

ANSWER: (with units!)

EQUATION FOR DENSITY:_____

SUBSTITUTE:_____ = [ ]

5) A rectangular block of lead has dimensions of 4.50 cm by 5.20 cm by 6.00 cm. The block weighs 1587 g. From this information, calculate the density of lead.

EQUATION & CALCULATION for VOLUME:_____

ANSWER: (with units!)

EQUATION FOR DENSITY:_____

SUBSTITUTE:_____ = [ ]

6) A 28.5 g sample of of iron pieces is added to a graduated cylinder containing 45.50 mL of water. The water level rises to the 49.10 mL mark, From this information, calculate the density of iron.

EQUATION & CALCULATION for VOLUME:_____

ANSWER: (with units!)

EQUATION FOR DENSITY:_____

SUBSTITUTE:_____ = [ ]

7) A rock has a mass of 210 grams and occupies a volume of 70 cm^3. What is its density?

EQUATION:_____

ANSWER: (with units!)

SUBSTITUTE:_____ = [ ]

8) A rock occupies a volume of 20 cm^3 and has a mass of 54 grams. Find the density of this rock.

EQUATION:_____

ANSWER: (with units!)

SUBSTITUTE:_____ = [ ]

9) A cube made of an unknown material has a height, width, and length of 9.5 cm. The mass of this cube is 3,645 grams. Calculate the density of this cube given this information.

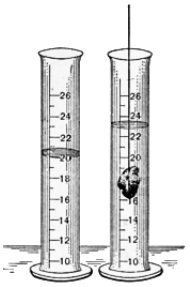
EQUATION & CALCULATION for VOLUME:_____

ANSWER: (with units!)

EQUATION FOR DENSITY:_____

SUBSTITUTE:_____ =

10) A graduated cylinder has 20.0 ml (cm^3) of water placed in it. An irregularly shaped rock is then dropped in the graduated cylinder and the volume of the rock and water in the cylinder now reads 30.5 ml (cm^3). The mass of the rock dropped into the graduated cylinder is 23.55 grams. What is the density of this rock?



EQUATION & CALCULATION for VOLUME:_____

ANSWER: (with units!)

EQUATION FOR DENSITY:_____

SUBSTITUTE:_____ =

Use the table below to answer questions #11-15:

Substance	**Density at 20 °C**
Wood	0.70 g/cm^3
Corn oil	0.92 g/cm^3
Water	1.00 g/cm^3

Substance	**Density at 20 °C**
Rubber	1.34 g/cm^3
Corn Syrup	1.38 g/cm^3
Copper	8.80 g/cm^3

11) An object has a mass of 24.0 g and a volume of 34.0 mL. What is its density?

EQUATION:_____

ANSWER: (with units!)

SUBSTITUTE:_____ =

From the table above, what substance is this object made of?_____

12) A sample of liquid has a mass of 155.0 g and a volume of 112.0 mL. What is its density?

EQUATION:_____ **ANSWER: (with units!)**

SUBSTITUTE:_____ = | |

From the table above, what
substance is this liquid made of?_____

13) An object has a mass of 78.8 g and a volume of 58.8 mL. What is its density?

EQUATION:_____ **ANSWER: (with units!)**

SUBSTITUTE:_____ = | |

From the table above, what
substance is this object made of?_____

14) An object has a mass of 224.5 g and a volume of 25.5 mL. What is its density?

EQUATION:_____ **ANSWER: (with units!)**

SUBSTITUTE:_____ = | |

From the table above, what
substance is this object made of?_____

15) A sample of liquid has a mass of 123.5 g and a volume of 134.0 mL. What is its density?

EQUATION:_____ **ANSWER: (with units!)**

SUBSTITUTE:_____ = | |

From the table above, what
substance is this object made of?_____