Physical Science: Study Guide – Measurement and Graphing
Mr. Allan – 2008

Part A: Fill in the Blank
(Fill in the correct word or words that best complete the sentence on your answer sheet)

1. The standard system of measurement used world wide is the _Systeme International_

2. It is abbreviated as __SI__ .

3. SI units are easy to use because they are based on multiples of __10__ .

4. The distance between two points is __Distance/Length__

5. What instrument is used to measure length? __meter stick__

6. To measure liquid volume, scientists use a __graduated cylinder__

7. The amount of matter in an object is know as the __mass__ of an object.

8. What instrument is used to measure temperature? __Thermometer__

9. Time is the interval between two events. Scientists measure time in __Seconds__.

10. An agreed upon quantity used for comparison is called a __Standard__

11. Which instrument is used in the laboratory to measure the volume of a regular shaped solid?
    __meter stick__

12. Any good measurement must have a __number__ and a __unit__ .

13. The correct formula for calculating density is __$D = \frac{m}{V}$__ .

14. Volume of irregular shaped object can be calculated using __graduated cylinder__

15. Density of a liquid should be labeled in which units: (a) g/ml) b) cm³   c) g/cm³   d)mL

16. When reading a graduated cylinder, always read the __Bottom__ of the curved surface.

17. The units used to express the volume of any solid object should be __cm^3__ .

18. Mass per unit volume is __Density__ .

19. If you know the object's mass and density, how do you calculate it's volume? (Write the
    formula!) __$V = \frac{m}{D}$__

20. Water in a graduated cylinder has a curved surface this curved surface is called the
    __meniscus__ .

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21. A _Graph_ is a visual display of data or information

22. The responding variable is plotted on the _y_ axis on a graph.

23. The title of a graph should be _responding_ variable vs _manipulated_ variable

Part B: Fill in the tables

Quantity	Base Unit	Symbol
Length	meter	m
Volume	Liter	L
Density	grams/cubic centimeter	g/mL or g/cm^3
Mass	Kilogram or gram	Kg or g
Time	Seconds	S
Temperature	Kelvin or Celsius	K or C

Prefix	Unit Abbr.	Value
Kilo	k	1000
hecto	h	100
deka	da	10
meter gram liter	m g l	1
deci	d	.1 or 1/10
cent	c	.01 or 1/100
milli	m	.001 or 1/1000

Part C: Metric Conversion
(Make the following metric conversions. Show ALL WORK to receive full credit)

1. Convert 1.55 Kilometers to meters.

    1 Km = 1000 m $\left(\frac{1.55 \, Km}{1}\right)\left(\frac{1000 \, m}{1 \, Km}\right)$ = 1550 m

2. Convert 2250 mm to m

    1 m = 1000 mm

    $\left(\frac{2250 \, mm}{1}\right)\left(\frac{1 \, m}{1000 \, mm}\right)$ = 2.25 m

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3. Convert 656.5 cm to Km

$1 Km = 1000 m$
$1 m = 100 cm$

$\left(\dfrac{656.5 cm}{1}\right)\left(\dfrac{1 m}{100 cm}\right)\left(\dfrac{1 Km}{1000 m}\right) = .006565 \; Km$

4. Convert 20.5 cL to L

$1 L = 100 cL$

$\left(\dfrac{20.5 cL}{1}\right)\left(\dfrac{1 L}{100 cL}\right) = .205 \; L$

5. Covert .910 Km to mm

$1 Km = 1000 m$
$1 m = 1000 mm$

$\left(\dfrac{.910 Km}{1}\right)\left(\dfrac{1000 m}{1 Km}\right)\left(\dfrac{1000 mm}{1 m}\right) = 910,000 \; mm$

Part D: Density Problems
(Answer the following density problems. Use the correct problem set-up. Label all numbers with the correct units)

1. A piece of aluminum has a mass of 95 g and a volume of 250 cm³. Find its density.

$m = 95 g$
$V = 250 cm^3$
$D = ?$

$D = \dfrac{m}{V}$

$D = \dfrac{95 g}{250 cm^3}$

$\boxed{D = .38 \; g/cm^3}$

2. Find the volume of 250 g of platinum having a density of 23.3 g/cm³.

$V = ?$
$d = 23.3 g/cm^3$
$m = 250 g$

$D = \dfrac{m}{V}$

$V = \dfrac{m}{D}$

$V = \dfrac{250 g}{23.3 g/cm^3}$

$\boxed{V = 10.73 \; cm^3}$

3. Find the mass of 55 mL of seawater having a density of 1.25 g/mL.

$m = ?$
$V = 55 mL$
$D = 1.25 g/mL$

$D = \dfrac{m}{V}$

$m = V \cdot D$

$m = (55 mL)(1.25 g/mL)$

$\boxed{m = 68.8 \; g}$

4. Density of a piece of brass is 8.8 g/cm³. If the mass of brass is 75g, calculate its volume.

$D = 8.8 g/cm^3$
$m = 75 g$
$V = ?$

$V = \dfrac{m}{D}$

$V = \dfrac{75 g}{8.8 g/cm^3}$

$\boxed{V = 8.5 \; cm^3}$

5. A bar of gold has a mass of 15g and a volume of 54.2 cm³. Find the density of the bar of gold.

$m = 15 g$
$V = 54.2 cm^3$
$D = ?$

$D = \dfrac{m}{V}$

$D = \dfrac{15 g}{54.2 cm^3}$
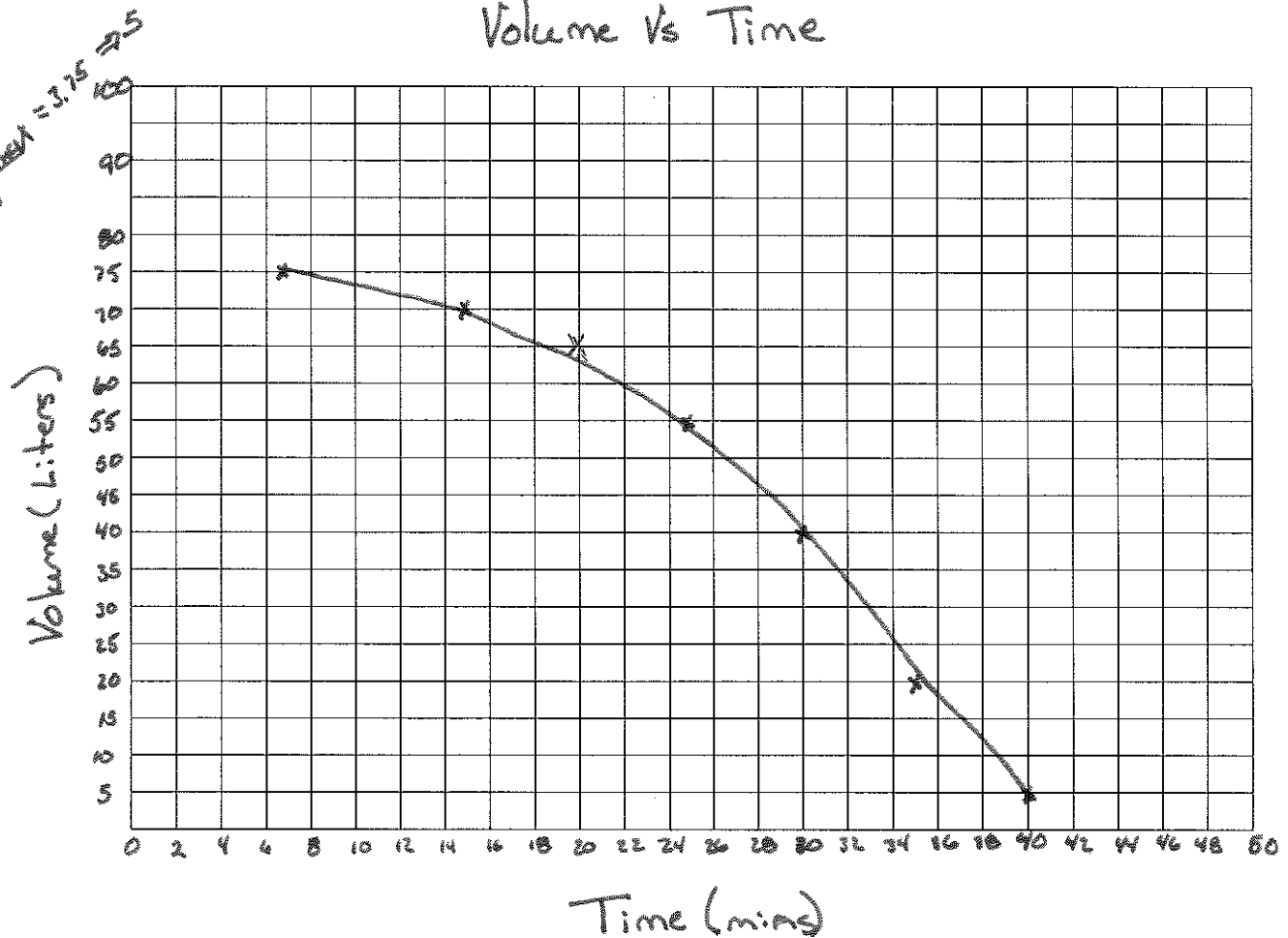
$\boxed{D = .27 \; g/cm^3}$

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Part E: Graph

(On the graph paper provided below, graph the following information. Include the correct title, x and y axis titles and units)

A man is recording the amount of water left in a pan as time passers.

Time (mins)	Volume (Liters)
5 mins	75 L
15 mins	70 L
20 mins	65 L
25 mins	55 L
30 mins	40 L
35 mins	20 L
40 mins	5 L

Volume Vs Time

Time (mins)

$\frac{40 \text{ max}}{25} = 1.6 \neq 2$