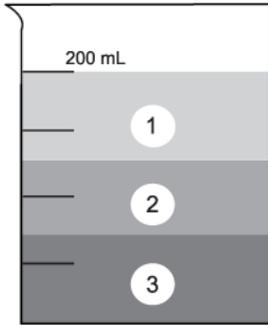# MiSP Density Worksheet #1

Name _____ Date _____

Your teacher will demonstrate that three different liquids — water, oil, and syrup — form layers
when they are carefully poured into a cylinder. Label the picture below, indicating which liquid
ended up in each of the different layers.

1. _____

2. _____

3. _____

Why did these layers form?

_____

_____

_____

As a result of your discussion at the beginning of class, you know that both the mass and the
amount (volume) must be considered in order to compare the "heaviness" of different substances.
The table below contains masses for four different volumes of water, oil, and syrup.

Volume (ml)	Mass of water (g)	Mass of oil (g)	Mass of corn syrup (g)
0	0	0	0
10	10	9	14
20	20	18	28
30	30	27	42
40	40	36	56
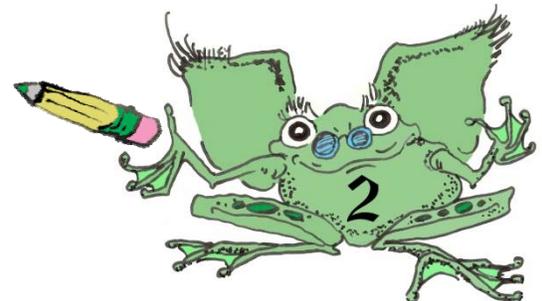
Analysis

- As the volume of water increases by 10 ml, the mass of water increases by _____ g. Therefore, an increase of 1 ml of water would yield an increase of _____ g in the mass of water.

- As the volume of oil increases by 10 ml, the mass of oil increases by _____ g. Therefore, an increase of 1 ml of oil would yield an increase of _____ g in the mass of oil.

- As the volume of corn syrup increases by 10 ml, the mass of corn syrup increases by _____ g. Therefore, an increase of 1 ml of corn syrup would yield an increase of _____ g in the mass of corn syrup.

- If we had x (any number of) ml of water, what would we expect the mass to be? _____

- If we had x (any number of) ml of oil, what would we expect the mass to be? _____

- If we had x (any number of) ml of corn syrup, what would we expect the mass to be? _____

When we speak of 26 miles per gallon, $12 per ticket, 2.68 children per family, or 0.9 grams per ml of oil, we are using a unit rate. Dividing the mass in g by the volume in ml yields a unit rate of change. The rate of change in mass (grams) per 1 unit of volume (milliliters) is the **density**. If a reference table shows the density of blood to be 1.6 g/ml, we know this means 1.6 g of mass per 1 ml of volume. Since the density of oil is 9 g/10 ml or 18 g/20 ml or 27 g/30 ml, the density is 0.9 g of mass per 1 ml of volume. The density is expressed as 0.9 g/ml.