

## Volume and Density WORKSHEET

In the SI system, volume can be expressed in two ways, one is in liters and the other as a unit of distance “cubed” such as  $\text{cm}^3$ . When using distance the “cube” is because you must multiply a distance times a distance times a distance. It is very important that all three distances are in the same unit such as cm or m or mm. For a cube the formula is length X width X height. Once you have the volume and the mass, it is easy to calculate the density of an object, that is, the amount of stuff in a certain space. To find the density, the formula is mass/volume. Work the following problems for practice; you’ll need it on an upcoming lab and chapter test.

1. What is the volume of a box measuring 1mX5mX6m? (Remember units)
2. What is the volume of a box measuring 2cmX7cmX3cm?
3. What is the volume of a cube measuring 5cm on each side?
4. What is the volume of a cube measuring 1cm on each side?
5. What is the volume of a box measuring 3cmX6cmX4cm?
6. What is the volume of a box measuring 8mmX10cmX5cm? (Be careful – units!)

*1cm<sup>3</sup> is equal to 1mL or another way to put it is 1L = 1,000cm<sup>3</sup>. Convert your answers as required.*

7. What is the volume in ml of a box measuring 2cmX3cmX4cm?
8. What is the volume in ml of a cube measuring 5cm on each side?
9. What is the volume in L of a box measuring 5cmX20cmX5cm?
10. What is the volume in L of a cube measuring 10cm on each side?
11. What is the volume in L of a cube measuring 1m on each side?

For the next problems you'll need to figure density. Remember that density is mass/volume.

12. An iron cube measures 10cmX10cmX10cm. What is its volume?
13. If the same iron cube weighs 7.9kg, what is its density in g/cm<sup>3</sup>?
14. What is the density of a cube of water measuring 2cmX4cmX1cm, with a mass of 8g?
15. What is the density of a block of wood measuring .9cmX2cmX6cm with a mass of 5.4g?
16. What has the greater density, a cube of water measuring 1cmX1cmX1cm and having a mass of 1g, or a block of plastic measuring 2cmX3cmX1cm with a mass of 4g?

Water has a density of approximately 1g/cm<sup>3</sup>. In fact 1cm<sup>3</sup> of water used to be the standard for a gram. Objects will sink if their density is greater than water and will float if their density is less. For the following problems, decide if the block will sink or float.

17. A cube measuring 2cm on each side weighs 5g, will it sink or float?
18. A block has a mass of 20g and measures 2cmX4cmX2cm, will it sink or float?
19. A hollow iron cube has measures 5cm on each side and has a mass of 20g. Will the iron cube sink or float?
20. A cube made of very old hard wood, has a mass of 45g and measures 6cm a side, will it sink or float?