Science 8 Name: _____ Class: _____

# Revision –Science 8.3: Fluids

## Vocabulary

| | | |
|---|---|---|
| Density | Force | Weight |
| Mean density | Hydraulic | Pressure |
| Unbalanced | Mass | Atmospheric Pressure |
| Balanced | Newton | Viscosity |
| Buoyancy | Pascal | Flow Rate |
| Fluid | Pneumatic | Volume |

1. _____ : a substance capable of flowing
2. _____: resistance to the flow of a fluid.
3. _____: how fast a liquid flows.
4. _____: the quantity of matter in an object.
5. _____: the amount of space occupied by an object or a substance.
6. _____ : the mass divided by the volume of an object or a substance
7. _____ : a push or a pull on an object
8. _____ forces: two or more equal forces, in opposite directions, on an object.
9. _____ forces: two or more unequal forces, in opposite directions, on an object.
10. _____: the downward force experienced by an object under gravity.
11. _____: the unit of measurement for Force.
12. _____: an upward force experienced by an object in a fluid.
13. _____: the total mass divided by the total volume of an object.
14. _____: Force divided by the area to which it is applied.
15. _____: the unit of measure used for pressure.
16. _____: the name of the pressure caused by air in the atmosphere.
17. _____ technology: uses a liquid under pressure to transmit forces.
18. _____ technology: uses a gas under pressure to transmit force.

## Chapter 7: Viscosity

1. Define ***fluid***. Name two states of matter that are fluids.

2. Define ***viscosity.***

3. Name an example of a very viscous fluid, a moderately viscous fluid, and a non-viscous fluid.

4. A group of students completed the experiment « The Great Fluids Race » and measured the following results. Observe the table and answer the questions.

| Fluid | Distance (cm) | Time of flow (min : sec) |
|---|---|---|
| honey | 10 | 2 :00 |
| molasses | 10 | 1 :45 |
| shampoo | 10 | 0 :45 |
| Hand lotion | 10 | 2 : 30 |

   a. Which fluid runs the fastest?

   b. Which fluid is the most viscous?

5. Compare solids, liquids, and gases on the following points: shape, volume, and distance between particles.

6. How does the particle theory explain viscosity?

7. How does the temperature of a liquid affect its viscosity? Give an example.

8. How does the force of attraction between particles affect the viscosity of a fluid? Give an example.

9. How does the concentration of a solution affect its viscosity?

## Chapter 8: Density

10. What is the difference between mass, volume, and density?

11. Draw the triangle that represents the formula, and give the formula for density, mass, and volume.

12. A student measures an unknown liquid substance and discovers that 1200 mL of liquid has a mass of 1080 g. What is the density of the liquid? Show your calculations.

13. An unknown solid has a volume of 460 $cm^3$ and a mass of 3620 g. Calculate the density – showing your calculations. Use the table 8.1 on page 312 to identify the substance.

14. Aluminum has a density of 2.70 $g/cm^3$. What is the mass of the 20 $cm^3$ block of aluminum?

15. A recipe calls for 200 g of vegetable oil, with a density of 0.92 $g/cm^3$. What is the volume of this quantity of oil?

16. Use the particle theory to explain why different substances have different densities.

17. Use the particle theory to explain how the density of a substance can change with temperature.

18. Use the particle theory to explain why salt water is denser than fresh water.

## Chapter 9: Buoyancy and Pressure

19. Explain the difference between balanced and unbalanced forces, and their effect on the movement of the object.

20. Give 4 differences between mass and weight. You can use a table for your answer.

21. What is buoyancy?

22. What determines whether or not an object floats or sinks in a fluid?

23. Give examples of technology that use buoyancy.

24. Explain why a block of metal doesn't float in water, but a metal boat will float?

25. Explain the difference between force and pressure.

26. What is the formula to calculate pressure? What is the unit used to measure pressure?

27. Explain what atmospheric pressure is, and give its approximate value at sea level.

28. Complete the following calculations and then answer question c :
    a. If I stand on snow wearing boots, my weight of 600 N is distributed over the area of my feet, which is approximately 0.08 $m^2$. What is my pressure on the snow?

    b. If I stand on snow wearing snowshoes, my weight of 600 N is distributed over the area of my snowshoes, which is approximately 0.75 $m^2$. What, now, is my pressure on the snow?

    c. Based on your calculations, explain why snowshoes help us to walk on snow.

29. What is Pascal's Principle?

30. Explain how we are using Pascal's Principle when we're using a tube of toothpaste.

31. Explain the difference between a compressible fluid (a gas) and an incompressible fluid (a liquid).

32. What is a hydraulic system? Give two examples.

33. What is a pneumatic system? Give two examples.

34. If a gas in a rigid container (the volume can't change) is heated, what happens the pressure? Give an example. What is a possible danger of this scenario?

35. If a gas in a container capable of expanding is heated, what happens to the container's volume? Give an example.

36. If we increase the pressure on a gas, what happens to its volume? Give an example.