G8 Science: Class 12 Homework

1. Explain how a dense substance, such as metal is able to float on a less dense substance, like water. Use an example in your explanation. **[2 marks]**

2. Why does a ship float at different levels depending on the type of water it sails in? **[2 marks]**

3. How have humans used the air chambers found in water hyacinths to design flotation devices? List two examples. **[3 marks]**

4. List two advantages and two disadvantages in regards to the density of oil in oil spills. **[4 marks]**

5. How is a swim bladder similar to a submarine ballast tank? **[3 marks]**

6. Define positive, negative and neutral buoyancy. Draw a diagram to illustrate the three terms. **[4 marks]**

7. Are the *Hindenburg* and the Goodyear blimp examples of hot air balloons? Explain. **[3 marks]**

8. You are the captain of a fully loaded ship sailing from warm tropical waters into the cold North Atlantic. As you sail north, will you need to dump some of your ballast water so that the ship can travel safely? Explain your answer. **[2 marks]**

9. Would a ship in Lake Ontario (fresh water) float higher or lower in the water than in the Atlantic Ocean (salt water)? Give reasons for your answer. **[2 marks]**

10. You would like to raise a very delicate piece of sunken equipment to the surface, but you must do it slowly. In the flotation bags, you can use either air or diesel oil. Which would you use? Explain your reasoning. **[3 marks]**

11. Carbon monoxide is less dense than air. Should you install carbon monoxide alarms on the floor or on the ceiling? Explain your reasoning. **[2 marks]**

12. Explain why liquids are less compressible than gases using the particle theory of matter. **[2 marks]**

13. Compare and contrast a hydraulic system and a pneumatic system. **[3 marks]**

14. Calculate the pressure produced by a force of 800N acting on an area of $2.0m^2$. Use the GRASS method. **[5 marks]**

15. The pressure of a gas contained in a cylinder with a movable piston is 300 Pa. The area of the piston is 0.5 m^2. Calculate the force that is exerted on the piston. Use the GRASS method. **[5 marks]**

16. Explain why a person wearing snowshoes can walk across a section of deep snow without sinking. **[2 marks]**

17. Explain why decreasing the diameter of a garden hose can help create a higher pressure of water from the hose. **[2 marks]**

18. If you wanted to walk on eggs, explain how you would design your footwear to not crack any of the eggs. **[2 marks]**

19. What force will produce a pressure of 50 kPa on an area of $0.20m^2$? Use the GRASS method. **[5 marks]**

20. Calculate the area of an object that experiences a pressure of 60 kPa by a force of 120N. Use the GRASS method. **[5 marks]**