

National Institute of Open Schooling
Senior Secondary Course: Physics
Lesson 9: Properties of Fluids
Worksheet-9

1. If you pour water and honey in separate funnels, you will observe that water comes out more easily than honey. Explain the properties of liquids which cause the difference in their flow.
2. Take a container and make three to four holes at different heights in the container. Fill the container with water and observe the flow of water from different holes. Explain the phenomenon responsible for different pressure at different height in the container. Calculate the pressure acting on the water at a depth of 2ft at 32°F?
3. Iceberg floats in water with part of it submerged. Calculate the fraction of the volume of iceberg submerged in water, if the density of ice is $\rho = 0.917 \text{ g cm}^{-3}$.
4. It is well known phenomenon that nose starts bleeding and the fountain pen leaks at high altitudes. Explain the phenomenon.
5. Take an egg and put it into the water, you will observe egg normally sinks in water. If we want to have an egg to float in water, what should we have to do? Why it is possible for a body to float completely immersed partially immersed and sinks in water?
6. Pascal's law states that when pressure is applied at any part of an enclosed liquid, it is transmitted undiminished to every point of the liquid as well as to the walls of the container. Observe your surroundings and write applications of Pascal's law in day to day life.
7. You may have seen different advertisements highlighting that detergents can remove oil stains from clothes. Explain how detergents works to remove oil stains from clothes.
8. It is observed that if the lower end of a cloth gets wet, water slowly rises upward. Also water given to the fields rises in the innumerable capillaries in the stems of plants and trees and reaches the branches and leaves. Why it is so? Prove that if the radius of tube is less, liquid rise will be high.
9. Consider two solid spheres P and Q each of density 8 g/cm^3 and diameters 1 cm and 0.5 cm, respectively. Sphere P is dropped into a liquid of density 0.8 g/cm^3 and viscosity $\eta=3$ poiseulles. Sphere Q is dropped into a liquid of density 1.6 g/cm^3 and viscosity $\eta=2$ poiseulles. Calculate the ratio of the terminal velocities of P and Q.
10. Observe your surroundings and comment what happens to the viscosity of liquid and gases when temperature increases.