AP®

Fluids

Unit: Fluids & Pressure

NGSS Standards/MA Curriculum Frameworks (2016): HS-PS2-10(MA), HS-PS2-1

AP® Physics 1 Learning Objectives/Essential Knowledge (2024): 8.1A, 8.1.A.1, 8.1.A.2, 8.1.A.3, 8.1.A.4

Mastery Objective(s): (Students will be able to…)

- Describe the characteristics of a fluid

Success Criteria:

- Fluids are described in terms of properties of the particles and density.

Language Objectives:

- Understand and correctly use the terms "fluid" and "density" as they apply in physics.

Tier 2 Vocabulary: fluid

Notes:

fluid: a substance that has no fixed (definite) shape; a substance that can flow

flow: the process of the individual particles of a fluid moving from one place to another.

When a fluid is flowing, particles of the fluid are in every location that is occupied by the fluid.

density (ρ) : the mass of a given volume of a substance.

$$\rho = \frac{m}{V}$$

The density of water varies with temperature (see *Table W. Properties of Water and Air* on page 568). Unless otherwise stated, we will assume that the density of fresh water is $1000 \frac{\text{kg}}{\text{m}^3}$ (which equals $1 \frac{\text{g}}{\text{cm}^3}$). This approximation is within 1 %, up to a temperature of 50 °C.

specific gravity: the ratio of the density of a fluid to the density of water. Water has a specific gravity of 1.

viscosity: a fluid's resistance to flow. A low-viscosity fluid, such as water, flows easily. A high-viscosity fluid, such as honey, does not flow readily.

ideal fluid: an imaginary fluid that is incompressible and has no viscosity.

In this course we will consider fluids to be ideal unless stated otherwise, in order to simplify the calculations.

Use this space for summary and/or additional notes: