



Science Virtual Learning

MPI Physics 210

Thermodynamics 9: Properties of Gases 1

May 19, 2020



Lesson: MPI Thermodynamics 9 - Properties of Gases 1
May 19, 2020

**Objective: To understand the volume and pressure of
gases**

This video discusses the concepts of gas volume and pressure, and the units for them.

<https://youtu.be/dhnYF8rbIc>

Video: Gas Properties 1



Ex 1: An empty oil barrel is filled with air. The radius of the barrel is 0.300 m, and it is 1.20 m high. Find the volume of the barrel in m^3 , L, and mL.

Ex 2: A table top is 1.40 m wide and 2.60 m long, and is immersed in air at 1.00 atm of pressure. How much force does the air exert on the table top? Why does that force not crush the table?

Video: https://youtu.be/GXsZeqTG_L4

Video: Gas Properties 1 - Examples



Homework 1

- Try to solve the problem yourself, then watch the solution video:
- https://youtu.be/q_m0lRnOodY

1. A spherical balloon of radius 0.0451 m is filled with air, which has a density of 1.29 kg/m^3 . What is the volume of the balloon in m^3 ? What is the mass of the air inside?

Homework 2

- Try to solve the problem yourself, then watch the solution video:
- https://youtu.be/BHUw-5Rb_M4

2. A bottle cap on a 2L soda bottle has a radius of 0.0150 m. The air inside the bottle is at 1.50 atm, and the air outside the bottle is at 1.00 atm.

- a) How much force does the inside air exert on the bottle cap?
- b) How much force does the outside air exert on the bottle cap?
- c) What is the net force on the bottle cap?



That's it!

