



Science Virtual Learning

MPI Physics 240

Thermodynamics 15: Work Done by a Gas, Part 1

May 12, 2020



Lesson: MPI Thermodynamics 15
Work Done by a Gas, Part 1
May 12, 2020

Objective: To be understand how a gas does work when it expands, and how to calculate the work if the pressure or volume is constant

This video discusses how a gas does work when expanding, and how to calculate it if the pressure or volume remains constant during the expansion

<https://youtu.be/XaTZXjl5aTc>

Video: Work Done by a Gas,
Part 1

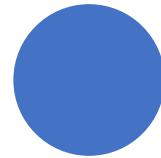


Ex 1: How much work does it take to blow up a spherical balloon from empty to a diameter of 12.0 cm in the atmosphere?

Ex 2: 0.0525 mole of air is in a piston that is free to move against the atmosphere. Its temperature is raised from 20.0°C to 45.0°C, causing the gas to expand and lift the piston. How much work does the gas do?

Video: <https://youtu.be/FGyxwbWKfgo>

Video: Examples



Homework

- Try to solve the problems yourself, then watch the solution video:
- <https://youtu.be/UNlxtjqekMk>

HW 1: As the temperature warms up, a balloon expands against the atmosphere from a radius of 3.00 cm to 3.25 cm. How much work was done by the gas in the balloon?

HW 2: A piston of radius 0.0133 m contains a warm gas. As it cools, the constant pressure of the outside air compresses the gas, doing 1.87 J of work on the piston, causing it to lower by 0.0200 m. What is the pressure of the outside air?



That's it!

