Appendix 1 Objectives

IB and AP Objectives

Thermodynamics

1. State the equation of state for an ideal gas
2. Describe the difference between an ideal gas and a real gas
3. Describe the concept of the absolute zero of temperature and the Kelvin scale of temperature
4. Solve problems using the equation of state of an ideal gas.

Processes

The First Law of Thermodynamics

1. Deduce an expression for the work involved in a volume change of a gas at constant pressure
2. State the first law of thermodynamics
3. Identify the first law of thermodynamics as a statement of the principle of energy conservation
4. Describe the isochoric, isobaric, isothermal and adiabatic changes of state of an ideal gas
5. Draw and annotate thermodynamic processes and cycles on P-V diagrams
6. Calculate from a P-V diagram the work done in a thermodynamic cycle
7. Solve problems involving state changes of a gas.

Second law of thermodynamics and entropy

1. State that the second law of thermodynamics implies that thermal energy cannot spontaneously transfer from a region of low temperature to a region of high temperature
2. State that entropy is a system property that expresses the degree of disorder in the system