

9 Temperature, gases, and heat – Part 1

—Answers

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Work through these after you have tried the questions yourself.

2.1 the average kinetic energy of the gas particles (their average speed of random motion).

2.2 $27 + 273 = 300$ K.

2.3 at fixed volume $\frac{P}{T}$ is constant: $P_2 = P_1 \frac{T_2}{T_1} = 2.0 \times 10^5 \times \frac{150}{300} = 1.0 \times 10^5$ Pa.

2.4 conduction, convection, and radiation; **radiation** works through empty space.

2.5 $Q = mc \Delta T = 0.50 \times 4200 \times 30 = 6.3 \times 10^4$ J.

2.6 water has a very high specific heat, so the sea warms and cools slowly; it moderates the air temperature nearby, keeping the coast milder than inland.