22 Photons – Part 1 — Answers

Answers

Work through these after trying the questions yourself.

22.1 A small packet (quantum) of electromagnetic energy.

22.2 $E = hf$.

22.3 The Planck constant.

22.4 Blue light (higher frequency).

22.5 $E = hf = (6.63 \times 10^{-34})(6.0 \times 10^{14}) = 4.0 \times 10^{-19}$ J.

22.6 The red laser. Red photons have a lower frequency, so each carries *less* energy. For the same total power, more of them must be emitted each second to make up the same energy.

22.7 Each ultraviolet photon has a high frequency, so it carries enough energy to damage skin cells. Red photons have too little energy each to do this, no matter how many of them arrive — brightness cannot make up for low photon energy.