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.