11. The energy levels are given by $E_n = n^2h^2/8mL^2$, where h is the Planck constant, m is the mass of an electron, and L is the width of the well. The frequency of the light that will excite the electron from the state with quantum number n_i to the state with quantum number n_f is $f = \Delta E/h = (h/8mL^2)(n_f^2 - n_i^2)$ and the wavelength of the light is

$$\lambda = \frac{c}{f} = \frac{8mL^2c}{h(n_f^2 - n_i^2)} \, .$$

We evaluate this expression for $n_i = 1$ and $n_f = 2$, 3, 4, and 5, in turn. We use $h = 6.626 \times 10^{-34}\,\text{J}\cdot\text{s}$, $m = 9.109 \times 10^{-31}\,\text{kg}$, and $L = 250 \times 10^{-12}\,\text{m}$, and obtain $6.87 \times 10^{-8}\,\text{m}$ for $n_f = 2$, $2.58 \times 10^{-8}\,\text{m}$ for $n_f = 3$, $1.37 \times 10^{-8}\,\text{m}$ for $n_f = 4$, and $8.59 \times 10^{-9}\,\text{m}$ for $n_f = 5$.