

## Launch Lab: Could Cockroaches Rule Earth? Answer Key

### Answers to Analysis Questions

1. Assuming that in 2 months there are 61 days, the female can lay  
$$\frac{16 \text{ eggs}}{5 \text{ days}} \times 61 \text{ days} = 195.2 \text{ eggs (round down to 195).}$$
2.
  - a) If 50% of these offspring are female (97 females) these females will produce  
(97 females  $\times$  195 eggs) = 18 915 eggs in the second generation.
  - b) This is an accurate number in theory, and if conditions are right, it is possible that cockroach populations will reach this number. However, not all of the eggs in an egg capsule mature into adults and reproduce. Some of the eggs will not develop, and then some of the eggs that do develop into cockroaches will not make it to reproductive age (due to predation, disease, lack of food, etc.).
3. The factors that limit the population growth of cockroaches are habitat, predators (human exterminators with insecticides), temperature range (cooler preferred), light levels, moisture availability, access to food (organic debris), etc.
4. Gene mutations will cause insecticide-resistance to develop in a population. Initially when a population is sprayed with insecticide, some members of the population may survive because of genetic variability. This variability enables natural selection to take place. The application of an insecticide will favour individuals with insecticide-resistant genes. These organisms will survive to reproduce and pass their genes along. As doses of insecticide increase, organisms in later generations will have increased resistance to the insecticide; in time, chemicals that at one time controlled insect populations will no longer be effective. The mechanisms behind natural selection will be the focus in Chapter 4.