The giant panda was listed as endangered in 1990.

EXAMPLE 2   Using Unit Analysis

It is estimated that about 125 species of birds and 60 species of mammals have become extinct since 1600. There are approximately 1000 species of birds and mammals that are currently facing extinction. Including all types of plant and animal species, the number of endangered species is around 20,000.

a. Estimate the number of species of birds that will become extinct in the next 100 years.

b. Estimate the number of years in which 40 more species of mammals will have become extinct.

The Endangered Species Coalition works to protect endangered species and their habitats.

SOLUTION

This estimate is, of course, quite primitive because it is based only on the rate of extinction during the 410 years from 1600 to 2010.

a. $\left(\dfrac{125 \text{ species}}{410 \text{ years}}\right)(100 \text{ years}) \approx 30.49 \text{ species}$

So, you could estimate that 30 species of birds will become extinct during the next 100 years.

b. This is the most difficult type of question in unit analysis. You need to perform an operation so that the resulting units are years. To do this, you can use the *Invert and Multiply Rule* for dividing by a fraction.

$$\dfrac{40 \text{ species}}{\dfrac{60 \text{ species}}{410 \text{ years}}} = (40 \text{ species})\left(\dfrac{410 \text{ years}}{60 \text{ species}}\right) \approx 273.33 \text{ years}$$

Invert the denominator and multiply.

So, you could estimate that it might take about 270 years for an additional 40 species of mammals to become extinct.
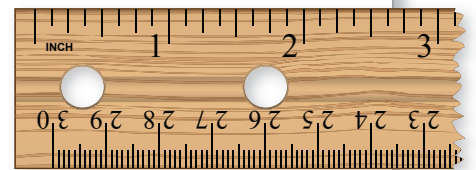

The bald eagle was once listed as an endangered species. In 2007, it was removed from the list due to success in protecting the species.

Here is a simple example of dividing by a fraction. How many one-eighth inches are in 2 inches?

$$\dfrac{2 \text{ in.}}{\dfrac{1}{8} \text{ in.}} = 2\left(\dfrac{8}{1}\right) = 16$$

Invert the denominator and multiply.

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c. Estimate the number of species of mammals that will become extinct in the next 100 years.

d. Estimate the number of years in which 40 more species of birds will have become extinct.