



## Problem of the Week

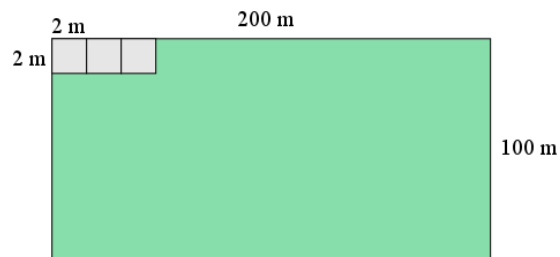
### Problem B and Solution

#### Work it Out

#### Problem

A gym is hosting an outdoor group exercise class. For many of the exercises, participants will need to make sure they are spaced well apart.

- (a) A large grassy field has dimensions of 100 m by 200 m. The field was divided into squares that were each 2 m by 2 m, as shown.



If one person was in the middle of each square, how many people could be on the field?

- (b) Imaginary Park is exactly 1 km by 1 km, or  $1 \text{ km}^2$ , which is equivalent to 100 hectares (ha) in size. If this park was divided into 2 m by 2 m squares for an exercise class like in part (a), and there is one person in the middle of each square, how many people would be in this park? How many people per hectare is that?
- (c) Stanley Park is located in Vancouver, BC. While not a rectangle, it covers an area of 405 hectares. Suppose that  $\frac{1}{5}$  of the park is not forested. If the number of people per hectare in the non-forested area of Stanley Park is the same as the number of people per hectare in Imaginary Park in part (b), how many people could do the exercise class in the non-forested area of Stanley Park?

#### Solution

- (a) We need to figure out the number of 2 m by 2 m squares in the field. Since there are  $200 \div 2 = 100$  squares along the long side of the park, and  $100 \div 2 = 50$  squares along the short side, there are  $100 \times 50 = 5000$  squares in total. That means the field could accommodate 5000 people.
- (b) Since Imaginary Park is 1 km by 1 km (or 1000 m by 1000 m), there could be  $1000 \div 2 = 500$  people in each row. Since there are  $1000 \div 2 = 500$  such rows, there could be  $500 \times 500 = 250\,000$  people in 100 ha of space. This works out to  $250\,000 \div 100 = 2500$  people per ha.
- (c) The non-forested area of Stanley Park is  $\frac{1}{5}$  of 405 ha, or  $\frac{1}{5} \times 405 = 81$  ha. This area will accommodate 2500 people per ha. This means a total of  $2500 \times 81 = 202\,500$  people could do the exercise class in the non-forested area of Stanley Park at one time.