Lesson 5   Scale Drawings

In a **scale drawing**, the dimensions of the object are in proportion to the actual object. The scale is the ratio of the drawing size to the actual size of the object.

Find the missing information.

scale: 3 cm: 1 km
drawing length: ?
actual length: 4.5 km

Set up a proportion to find the length.

scale → $\dfrac{3}{1} = \dfrac{n}{4.5}$ $\dfrac{\text{drawing length}}{\text{actual length}}$

$3 \times 4.5 = 1 \times n$

$13.5 = n$

The length of the drawing is 13.5 cm.

scale: ? cm: ? m
drawing length: 6 cm
actual length: 12 m

Set up a ratio to find the scale.

$\dfrac{6 \text{ cm}}{12 \text{ m}}$ $\dfrac{\text{drawing length}}{\text{actual length}}$

$\dfrac{1 \text{ cm}}{2 \text{ m}}$

The scale is 1 cm: 2 m.

A **scale ratio** is a comparison of amounts with the same units

The scale *ratio*: is: 1:200

Find the missing information.

	a		*b*

1. scale: _____
   drawing length: 5 cm
   actual length: 20 m

   Scale ratio: _____

   scale: 2 cm: 5 m
   drawing length: _____
   actual length: 35 m

2. scale: 3 cm: 2 m
   drawing length: 13.5 cm
   actual length: _____

   scale: 1.5 cm: 5 m
   drawing length: _____
   actual length: 100 m

3. scale: _____
   drawing length: 2.5 cm
   actual length: 40 km

   Scale ratio: __1 : _____

   scale: 1 m: 0.5 km
   drawing length: 4 m
   actual length: _____

4. scale: 2 cm: 3 km
   drawing length: 3 cm
   actual length: _____

   scale: _____
   drawing length: 1 mm
   actual length: 3.5 m

Solve each problem.

1. Mr. Jonas made a scale drawing of an addition that he is making to his house. The scale he used is 1 cm: 3 m. The length of the addition is 12 m. What is the length of the addition on the drawing?

   The length of the addition on the drawing is

   _____ cm.

2. Elizabeth is designing a flower garden for her community. The garden will be 9 m wide and 13.5 m long. The drawing has a width of 5 cm. She includes in the drawing a key for the scale that is 1.25 cm long. What actual distance does the key for the scale represent?

   The drawing of Elizabeth's garden is scaled as

   _____.

   Scale Ratio: _____

3. Use the scale from problem 2 to find the length of Elizabeth's garden in the drawing.

   Elizabeth's drawing has a length of

   _____ cm.

4. Mrs. Finney is a sculptor of famous people. She uses a 1 cm: 2 cm scale. She is making a sculpture of the mayor of her city. The finished sculpture is 13.75 cm from the base of the neck to the tip of the head. What is the actual height of his head from the base of his neck to the tip of his head?

   The mayor's head from the base of his neck to

   the tip of his head is _____ cm.

5. The actual size of an artifact is 3 cm by 5.5 cm. In the archive files a drawing that measures 9 cm by 16.5 cm shows every detail of its design. Is the ratio that represents this scale drawing greater than 1, equal to 1, or less than 1?

   The scale for the archived drawing is

   _____.

   Scale Ratio: _____