Need to understand scales?
Watch http://www.youtube.com/watch?v=XtkU4VkWh8I.

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Plans and Scale Models

Scale is the fraction that shows the relationship between the measurement of matching parts of a real object and a drawing of it. A scale can be written without units when the units are the same; this is called a **scale factor**.

A **scale drawing** is a drawing which uses a specific ratio to represent an object that is too large or too small to be drawn in its actual dimensions.

A **plan** is a set of orthographic drawings used to describe a place or object. Plans are often used for technical purposes.

A **scale model** is a three-dimensional physical replica of an object which is very large or small.

What are some common examples of scale drawings?

- maps
- blue prints
- building/room plans
- directions for assembling models/products
- clothing patterns

Who uses scale drawings and models?

- construction or fabrication industry – to communicate building instructions
- engineers – to test the performance of a design at an early stage of development
- architects – to evaluate + sell the look of new construction before building
- filmmakers – to create objects/sets that cannot be built in full size
- salesmen – to promote new products such as heavy equipment they don't want to carry with them

Why are scale drawings and models necessary?

- to reduce costs in early stages of manufacturing process – reduce error
- easier to work with when used as a set of instructions

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"I don't think that blob was an unusual roof design, but a coffee stain."

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Example 1

A scale drawing of a spider is 5 centimeters long. The actual spider is 10 millimeters long.

a. What is the scale of the drawing?

5cm : 10mm

b. What is the scale factor of the drawing?

change to same units

$5\text{cm} \times \frac{10\text{ mm}}{1\text{ cm}} = 50\text{ mm}$

∴ scale factor = 50 mm : 10 mm

OR $\frac{50}{10}$ OR 5

c. The spiders mate is 8mm, what size should the drawing for it be in cm? Explain how to decide whether to use the scale or scale factor?

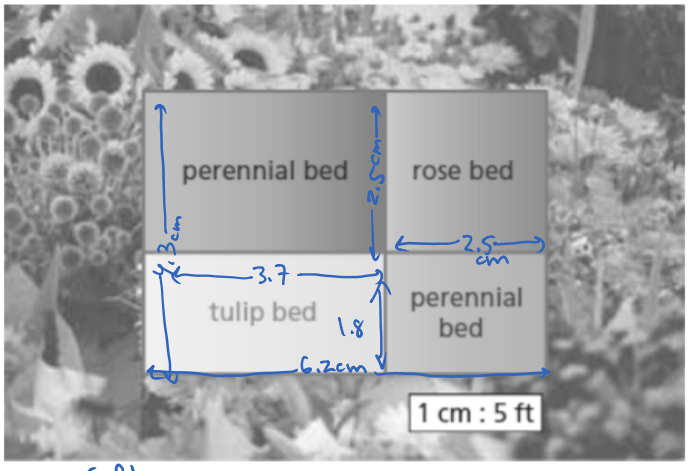
Example 2

Use the diagram to answer the following questions. (Use rulers to measure)

a. What is the actual length of the flower garden?

$4.3 \times 5 = 21.5$

$6.2 \times 5 = 31$ ∴ dimensions are 21.5 ft by 31 ft.



b. What are the actual dimensions of the rose bed?

$2.5 \times 5 = 12.5$

∴ dimensions are 12.5 ft by 12.5 ft.

c. What are the actual perimeters of the perennial beds?

$P_1 = 2.5 + 2.5 + 3.7 + 3.7$

$= 12.4\text{ cm} \times 5$

$P_1 = 62\text{ ft}$

$P_2 = 1.8 + 1.8 + 2.5 + 2.5$

$= 8.6\text{ cm} \times 5$

$P_2 = 43\text{ ft}$