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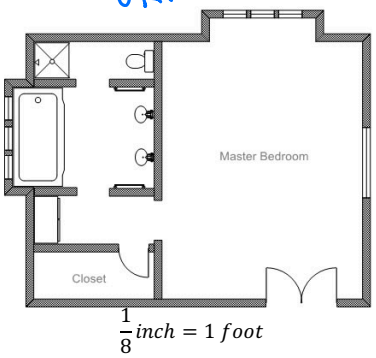
LEARNING OBJECTIVE: We will compute actual lengths from a scale drawing. (G7M4L13)

CONCEPT DEVELOPMENT:

Scale: On maps, or architectural plans, you might see a scale. This differs from a scale factor because often times, the scale does not use the same units in its comparison, whereas scale factors ALWAYS use the same units.

Examples:

ORIG DRAW

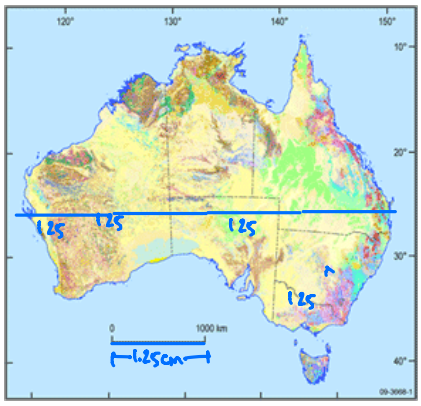


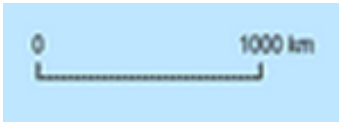
$\frac{1}{8} inch = 1\ foot$

$\frac{1}{8}$ inch = 12 inches.

1 inch = 96 in

Scale factor: 96





Scale factor
80,000,000

It **might** help to convert units so that you can establish a scale factor, and in some cases it might not. In looking at the pictures above, I would convert the architectural plans to a scale factor by converting feet to inches and finding how many inches in actual length are represented by one inch on the scale drawing.

$1 cm = 80,000,000 cm$

$1.25 cm = 1000 km$

$\frac{1.25 cm}{1.25} = \frac{100,000000 cm}{1.25}$

Why would it be less useful to do a similar conversion for the map of Australia?

$1 mm$

$1 cm = 10 mm$

$1 m = 100 cm = 1000 mm$

$1 km = 1000 m = 100000 cm = 1,000,000 mm$

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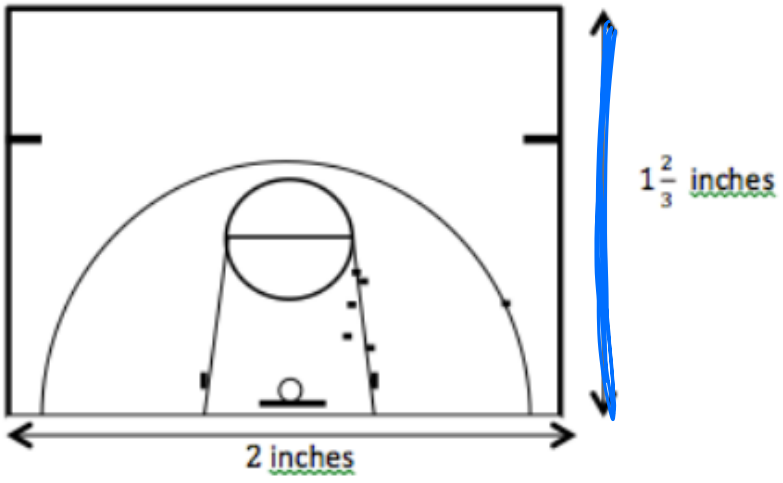
Guided Practice:

Steps for Computing Actual Lengths from a Scale Drawing

1. Find the scale. Identify the UNITS of the scale drawing and the corresponding UNITS of the actual object.
2. Set up a scale factor, applying the scale ratio as a constant of proportionality, but being careful about the different units.
3. Evaluate your answer in the context of the problem.

Will wants to install a basketball hoop along with a half court marked with all the boundary lines and shooting lines so that he and his classmates could use it at recess. After checking with Ms. Thompson and Ms. Lundberg, he was told that the school would support this idea if the court fit on a piece of land that was no bigger than 25 feet by 75 feet. Will this be big enough?

Scale Drawing: 1 inch on the drawing corresponds to 15 feet of actual length.



Show your work here.

$1\frac{2}{3} \times 15 = 25$ feet

$2 \times 15 = 30$ feet

Yes. Will / Riley could get his basketball court.

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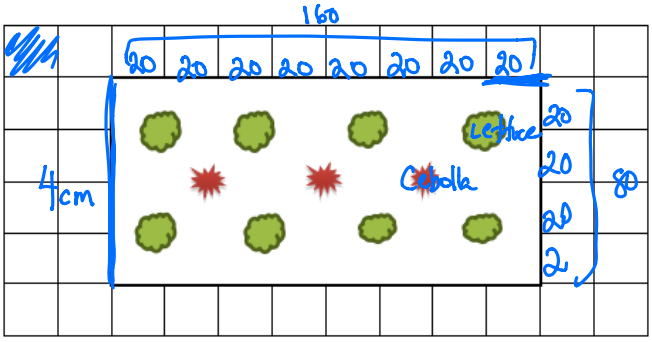
The diagram below represents a garden. The scale is 1 cm for every 20 km of actual length. Each square in the drawing represents 1 square centimeter. What are the actual dimensions of the garden.



4cm x 8cm

x 20 x20

80km 160km

80km x 160km

A graphic designer is creating a billboard advertisement for Banana Republic. Every 0.25 inches on her design corresponds to 5 feet of actual billboard space. How big is the billboard if the graphic designer's height was $3\frac{1}{8}$ inches, and the width was $6\frac{1}{4}$ inches?

Scale

.25in = 5ft

x4 1in = 20ft. x4

1in	20ft
$3\frac{1}{8}$ in.	62.5 ft
$6\frac{1}{4}$ in	125 ft.

1in → 20ft.

SCALE

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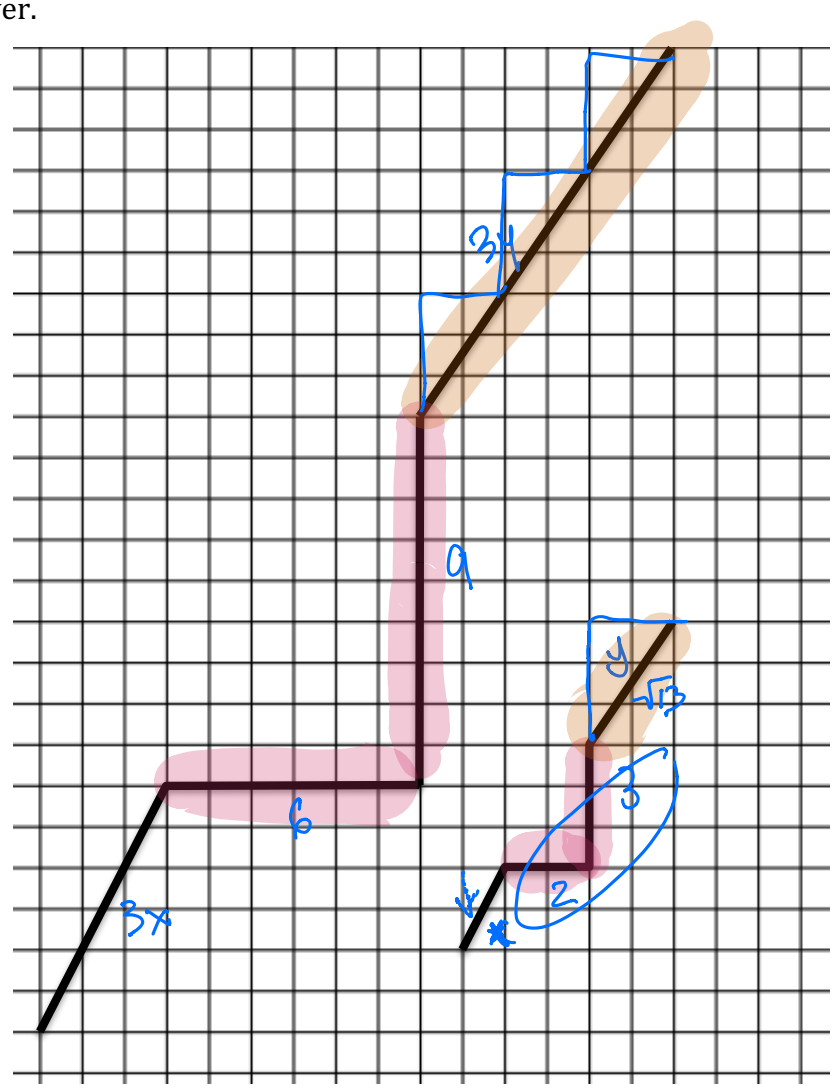
The length of the longer path below is 32.4 units. The shorter path is a scale drawing of the longer path. Find the length of the shorter path and explain how you arrived at the answer.



$32.4 \times \frac{1}{3} = 10.8$ units

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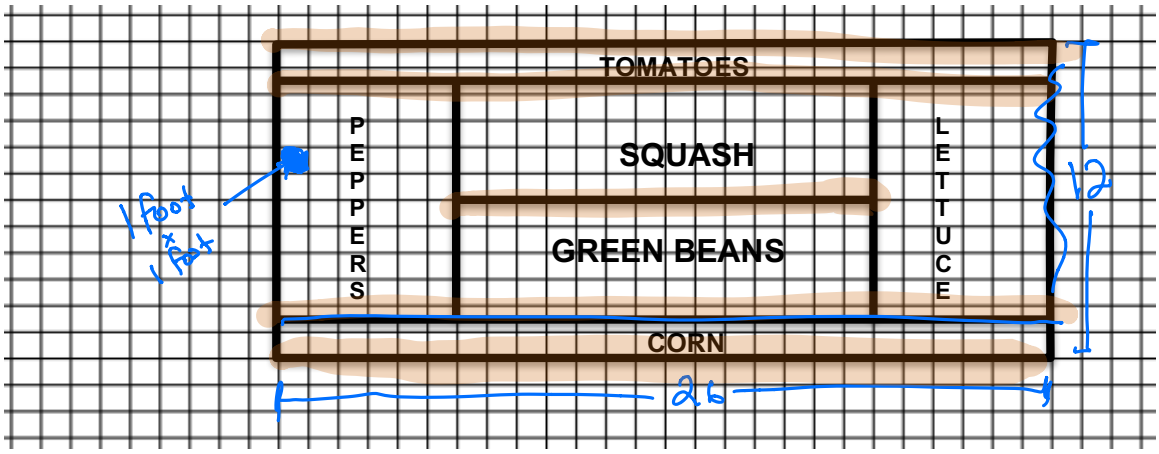
Kylie designed her garden as shown in the diagram below. The distance between any two consecutive vertical grid lines is 1 foot, and the distance between any two consecutive horizontal grid lines is 1 foot. Each square in the grid represents an area of 1 square foot. After designing the garden, Kylie decides she wants her actual garden to be 75% of the size represented in the diagram. Answer the questions below.



a. what are the outside dimensions shown in the blueprint?

12 x 26

b. What are the overall dimensions in the actual garden?

.75 (26)
.75 (12) 9 x 19.5

c. If Kylie plans to use a wire fence to divide each section of the garden, how much fence does she need?

26
26
26
26
14

12
12
9
9

160 ft. x .75

120 ft.

d. If the fence costs $3.25 per square foot plus 7% sales tax, how much does the fence cost in total?

120 x 3.25 = $390 x 1.07 tax

price

$417.30

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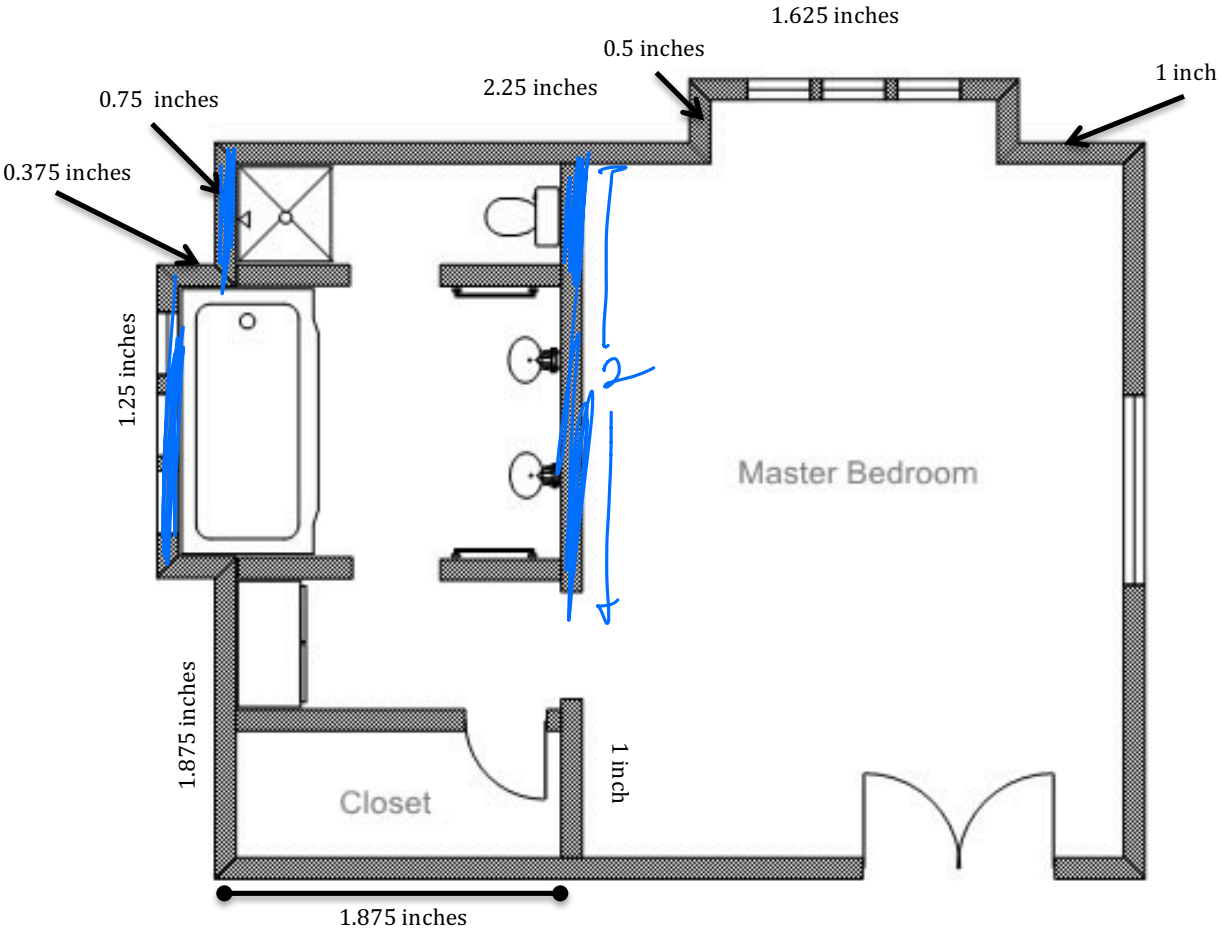
Independent Practice:

Fill in the actual lengths for ALL of the walls with the information provided.



Scale: $\frac{1}{4} inch = 1\ foot$

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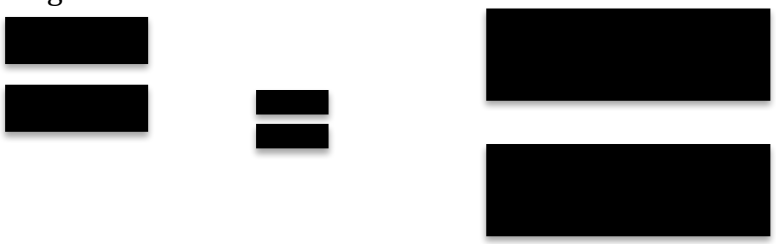
Activating Prior Knowledge:

We can identify enlargements and reductions of originals and identify a scale factor.

Original:



Closure:

Use exit ticket from lesson 18. Allow students to work in pairs.

Notes:

This maps to lesson 18 from module 1 of Grade 7 and lesson 14 from module 4.
Homework should be problem set from lesson 14, module 4.