Date _____

7.1 2-D Scale Drawings

Focus: measuring, scale, proportional reasoning, problem solving

Chapter 7

Warm Up

1. What fraction of a metre is

a) 50 cm? _____

b) 25 cm? _____

c) 75 cm? _____

2. What fraction of a foot is

a) 6 inches? _____

b) 3 inches? _____

c) 9 inches? _____

3. How many 50-cm sections are in

a) 2 m? _____

b) 3 m? _____

c) 4.5 m? _____

4. How many 6-in. sections are in

a) 18 in.? _____

b) 9 ft? _____

c) $11\frac{1}{2}$ ft? _____

5. A road map uses a scale of 1 cm : 7 km. What is the actual distance between 2 towns that are 6 cm apart on the map?

6. A particular yarn for a knit sweater yields 4 rows per inch. How many rows do you need to make an arm that is 15 in. long?

Using Scale Drawings

- A dressmaker works from a pattern.
- A landscaper works from a drawing.
- An electrician works from a blueprint.
- A truck driver works from a map.

All of these people need to know how to read a scale drawing.

A **scale drawing** is a reduced or enlarged picture of an object.

Go to pages 187–188 to write the definition for **scale drawing** in your own words.

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1. A bathroom floor is 8 ft long by 5 ft wide.

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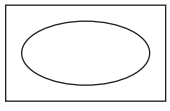
a) In the top-left corner of the grid above, create a scale diagram of the bathroom floor using a scale of 1 square to 1 ft. Label it Drawing A.

b) In the top-right corner of the grid above, create a scale diagram of the bathroom floor using a scale of 1 square to 2 ft. Label it Drawing B.

c) In the bottom-left corner of the grid above, create a scale diagram of the bathroom floor using a scale of 1 square to 6 in. Label it Drawing C.

d) A bathtub is 5' $\times$ 3'. Draw a bathtub to scale in each bathroom. Use this symbol to show the tub:



e) Which scale drawing do you prefer working with? _____ Explain why.

_____

_____

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2. a) Measure the length and the width of this book in centimetres. Round to the nearest centimetre.

length = _____ cm width = _____ cm

b) Draw a scale diagram of this book using a scale of 1 square to 3 cm.

c) Measure the diameter of 1 of the holes in the book.

Round to the nearest centimetre. _____

d) Rounding to the nearest centimetre, measure the distance

- of 1 hole from the left edge of the book _____
- of the top hole from the top of the book _____
- between the top hole and the middle hole _____
- from the bottom of the book to the bottom hole

_____

e) Draw all 3 holes to scale on your diagram above.

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3. a) One wall in a family room measures 12 ft long and 8 ft high. Make a scale diagram using the scale 1 square to 6 in.

You have artwork to hang.

- Two prints are each 36" high × 24" wide.
- Two plaques are each 12" high × 18" wide.
- One photo is 21" high × 15" wide.

b) Calculate the number of squares needed to draw each piece of art to scale.

Print: _____ squares × _____ squares = _____

Plaque: _____ squares × _____ squares = _____

Photo: _____ squares × _____ squares = _____

c) Draw each piece of art on the diagram. You can cut out paper templates to help you decide where to hang the pieces.

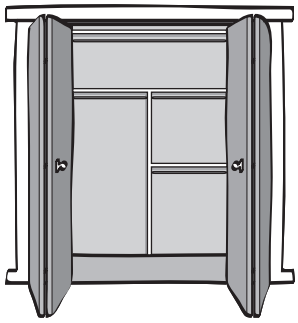
d) How can your knowledge of proportional reasoning help you plan where to put the pictures?

_____

_____

4. When you move, you get new closets and storage areas. Designing a closet to organise your belongings is an inexpensive solution to storage challenges.

a) A closet is 3 m long and 2.4 m high. Choose an appropriate scale and draw a scale diagram of the closet as if you were looking into it.



Scale: 1 square to _____.

b) Design the interior of the closet with the following features:

- At least 1 rod for hanging pants.
- At least 1 rod for hanging shirts.
- Drawers or baskets for socks, underwear, etc.
- Compartments or a rack for sports equipment.
- Shelves for sweaters, books, etc.

c) Add 1 other item of your choice to your closet design.

5. a) Measure the length and the width of your classroom. Use whichever units you prefer.

length = _____ width = _____

b) Count the number of squares along each side of a piece of grid paper: _____ squares × _____ squares.

c) Choose a scale that allows your scale diagram to take up most of the page.

Scale: 1 square to _____.

Check pages 286–289 at the back of this book for grid paper.

d) Draw a scale diagram of the floor of the classroom as seen from above.

e) Mark the location of doors and windows on the diagram.

6. Your class is considering rearranging the furniture in the classroom.

a) Use another piece of grid paper to make scale templates of the big items in your classroom (desks, cabinets, white board, etc.).

b) Arrange and rearrange the templates on the diagram from #5 until you have a design you like. Do not attach the templates to the diagram.

c) Show your design to someone else. Do they have suggestions for improving it? Once you have decided on a final layout, attach the templates to the diagram.

☑ Check Your Understanding

1. Repeat #5 and #6 using an area of personal interest, such as
- another classroom, a computer lab, or a weight room
- a flower bed, a courtyard, or a parking area
- a bedroom, a garden, a kitchen, or a bathroom

2. What other situations might use a scale drawing?