1 Standard Area Units

Goal Explain why we use standard units to measure area.

1. You want to estimate the area of your kitchen table. Choose the item that would be the best unit to measure this area. Explain your choice.

   A. a CD case **B.** a piece of string **C.** a plastic cup

   A is the best unit since a CD case is a flat

   surface like the table.

2. Estimate the area of the surface of a table, desk, cutting board, or some other flat object. Measure the surface using a playing card, a paper napkin, an envelope, or another object that is square or rectangular. Record what surface you measured, what you used, and the area.

   Answers will vary.

3. **a)** How many pillows is the area of the top surface of your bed?

   Answers will vary.

   b) If you measured your bed using a different pillow, would your answer be the same? Why or why not? *If the pillows are the same size, the answers will be the same. If the pillows are a different size, the answers will be different.*

4. Shani's family bought a new carpet for the living room. Before they bought the carpet, they measured the area of the floor. Give 2 other examples when an area measurement is needed.

   Answers will vary. For example, paint for any surface, tiles for any surface, wallpaper.

2 Square Centimetres

Goal **Estimate, measure, and compare area using square centimetres.**

1. Measure the area of each shape to the nearest whole square centimetre.
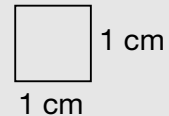
At-Home Help

A **square centimetre** is one standard unit for measuring area.

1 cm

1 cm

A square with sides of 1 cm has an area of one square centimetre.

a) 6 square centimetres

b) 5 square centimetres

c) 11 square centimetres

d) 12 square centimetres

e) 8 square centimetres

2. List the shapes from Question 1 in order from greatest to least area, using their letters. _____ d), c), e), a), b) _____

3. Nisha thinks that both of these shapes have an area of 1 square centimetre. Is she correct? Explain why or why not.

Yes, one shape is 1 cm by 1 cm and the other is

half of 1 cm by 2 cm.
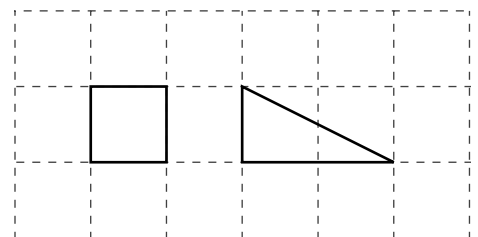
3 Square Metres

Goal **Estimate area using an appropriate area unit.**

1. Would you use a square metre or a square centimetre to measure each item?

   a) a school flag _____ square metre _____

   b) a playing card _____ square centimetre _____

   c) a helicopter landing pad _____ square metre _____

   d) a postcard _____ square centimetre _____

   e) a floor mat for gymnastics

   _____ square metre _____

At-Home Help

A **square metre** is another standard unit for measuring area.

1 m

1 m
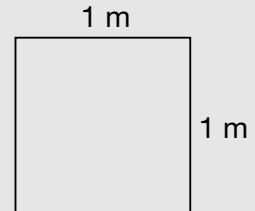
A square with sides of 1 m has an area of 1 square metre.

2. If you had 1 square metre of material, which of these items could you make?

   A. a Batman cape

   B. a tent large enough for a family of 4

   C. a curtain for the school stage

3. Which measurement would be the most reasonable estimate for the area of your bedroom floor?

   D. between 1 square metre and 4 square metres

   E. between 20 square metres and 30 square metres

   F. between 8 square metres and 15 square metres

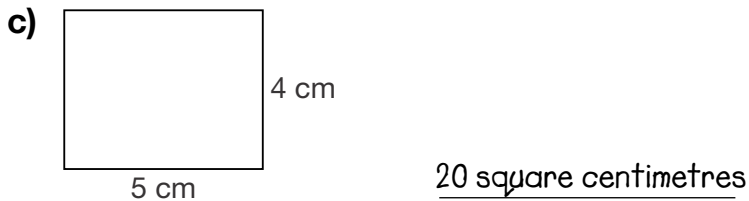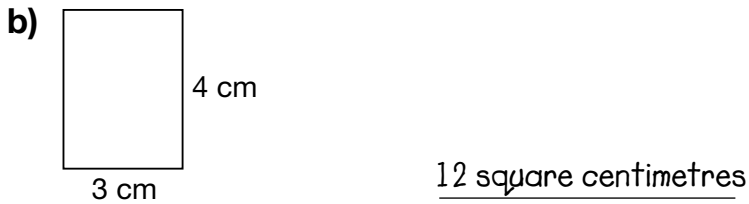4. A square metre is divided into 4 parts and used to make a new shape. What is the area of the new shape? Explain.
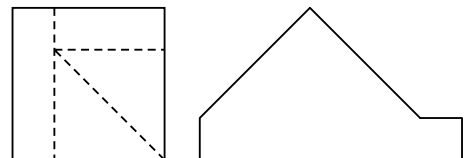
   1 square metre. It changed shape, but it is all there and nothing more was added.

4 Relating Linear Dimensions and Area

Goal Relate the area of a rectangle to its length and width.

1. What is the area of each rectangle?

a)

4 cm

2 cm

8 square centimetres

b)

4 cm

3 cm

12 square centimetres

c)

4 cm

5 cm

20 square centimetres

At-Home Help

Area is measured by finding out how many square units are needed to cover the surface.

The area of a rectangle is related to its side lengths.

3 cm

5 cm
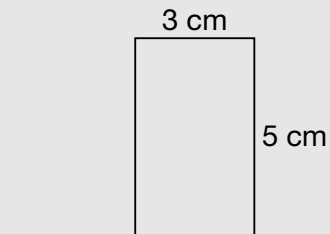
area = 3 cm × 5 cm
     = 15 square centimetres

2. Complete the table.

Rectangle	Width	Length	Area
A	3 cm	2 cm	*6 square centimetres*
B	7 cm	*2 cm*	14 square centimetres
C	4 cm	6 cm	*24* square centimetres
D	*7 cm*	7 cm	49 square centimetres

3. What is the length of the other side?

a)

4 cm

8 cm

area = 32 square centimetres

b)

10 cm

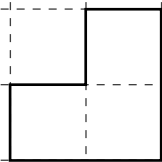*2 cm*

area = 20 square centimetres
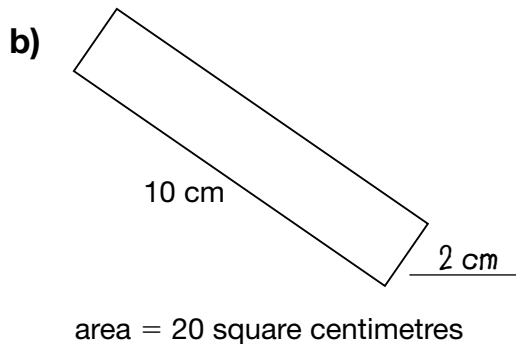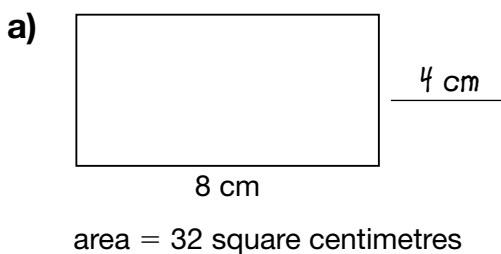
5 Relating Shape, Area, and Perimeter

Goal Investigate how changes in shape affect area and perimeter.

1.

a) area:

3 square centimetres

perimeter:

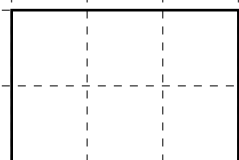_8 cm_
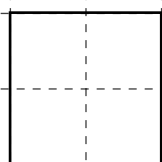
b) area:

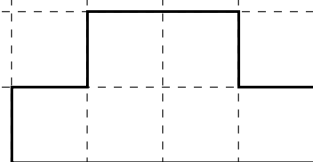_4 square centimetres_

perimeter:

_8 cm_

The shapes have the same _____perimeter_____.

2.

a) area:

6 square centimetres

perimeter:

_10 cm_

b) area:

6 square centimetres

perimeter:

_12 cm_

The shapes have the same _____area_____.

At-Home Help

Shapes can have the same area but different perimeters.

5 cm

4 cm
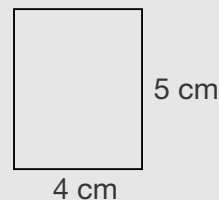
area = 4 cm × 5 cm
     = 20 square centimetres

perimeter = 4 cm + 5 cm +
            4 cm + 5 cm
          = 18 cm

2 cm

10 cm

area = 10 cm × 2 cm
     = 20 square centimetres

perimeter = 10 cm + 2 cm +
            10 cm + 2 cm
          = 24 cm

Shapes can also have the same perimeter but different areas.

Solve Problems Using Organized Lists

Goal Use an organized list to solve area problems.

1. How many different rectangles could you make with an area of 24 square tiles? 4
   What are they?

   1 by 24

   2 by 12

   3 by 8

   4 by 6

2. Sara chooses 3 numbers for the combination of her new bike lock. She uses 1, 4, and 7. She can use each number only once. What are the possible combinations?

   1-4-7

   1-7-4

   4-1-7

   4-7-1

   7-1-4

   7-4-1

At-Home Help

An **organized list** allows you to record information in a clear and organized way.

Vanessa has 35 cents. She has 2 of these 3 types of coins— quarters, dimes, and nickels. How many combinations of coins might she have?

25	10	5
1	1	0
1	0	2
0	3	1
0	2	3
0	1	5

There are 5 possible combinations.

3. Ben goes to the grocery store for his mom. He spends less than $5. He buys at least one of each of the following items.
   • apples at 50¢ each
   • bread at $1.60 a loaf
   • crackers at $1.25 a package
   Find all the combinations of what he might have bought.

apples	bread	crackers	total cost
1	1	1	$3.35
2	1	1	$3.85
3	1	1	$4.35
4	1	1	$4.85
1	2	1	$4.95
1	1	2	$4.10
2	1	2	$4.60

CHAPTER 8

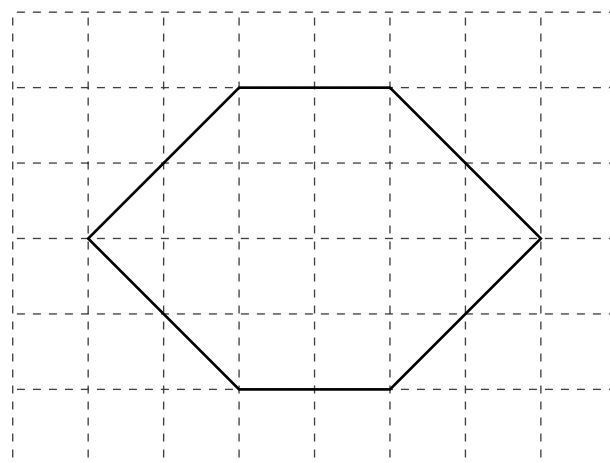# Test Yourself Page 1

Circle the correct answer.

1. You want to estimate the area of the top surface of a desk. Which item would you use?

    A. a piece of string   **C.** an envelope

    B. a measuring cup   **D.** a balance scale

2. What is the area of this shape to the nearest whole square centimetre?

    E. 18 square centimetres

    F. 20 square centimetres

    G. 14 square centimetres

    H. 16 square centimetres

**3.** Which of the following would not be measured using square centimetres?

    A. a schoolyard   **C.** a photograph

    B. a placemat   **D.** a piece of note paper

4. Which measurement would be the most reasonable estimate for the area of your kitchen floor?

    E. between 1 square metre and 3 square metres

    F. between 10 square metres and 20 square metres

    G. between 30 square metres and 40 square metres

    H. between 40 square metres and 50 square metres

5. What is the area of this rectangle?

    A. 24 cm

    B. 24 square centimetres

    C. 10 cm

    D. 20 square centimetres

    4 cm

    6 cm
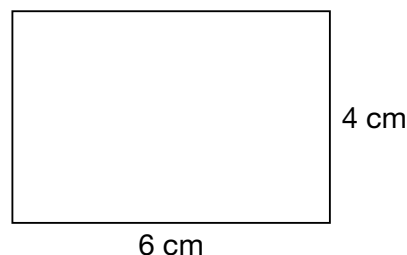
Test Yourself Page 2

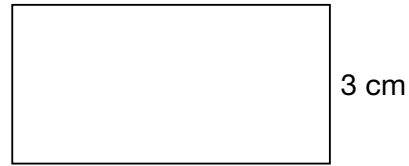**Circle the correct answer.**

6. What is the length of the other side?

E. 6 cm

F. 15 cm

G. 6 square centimetres

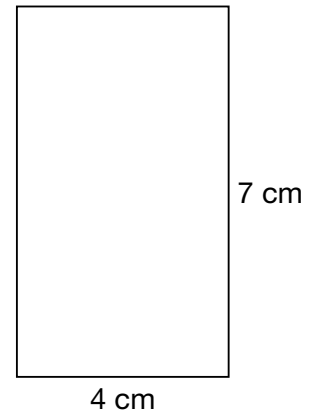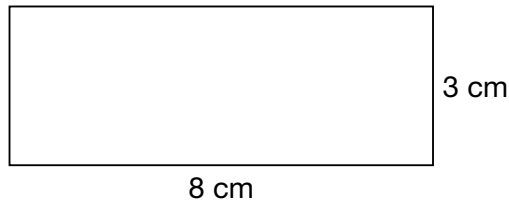**H.** 9 square centimetres

3 cm

area = 18 square centimetres

7. Which of these measurements is the same for the 2 rectangles?

A. length

B. width

C. perimeter

D. area
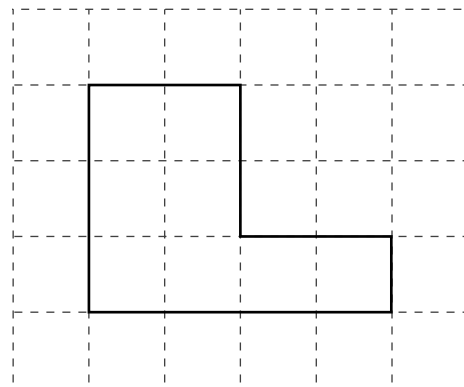
3 cm

8 cm

7 cm

4 cm

8. Which is true for the shape shown?

E. area = 14 square centimetres
perimeter = 8 centimetres

F. area = 8 square centimetres
perimeter = 14 centimetres

G. area = 8 centimetres
perimeter = 14 square centimetres

H. area = 8 square centimetres
perimeter = 8 centimetres

9. How many different rectangles can be made using exactly 28 square tiles placed side by side?

A. 4   **B.** 5   **C.** 3   **D.** 8

10. Each of the digits 3, 5, and 6 is used only once to make a new number. How many different numbers can be made?

E. 5   **F.** 3   **G.** 8   **H.** 6