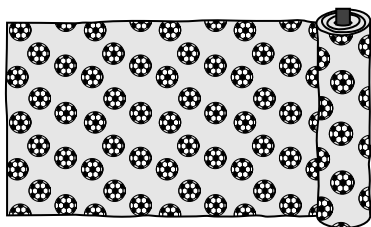**CHAPTER 9**

1

Estimating Products

Goal   **Estimate products of decimal numbers using whole numbers.**

1. Each team banner uses 1.9 m of fabric. The fabric costs $7.99 for each metre.

a) Estimate the number of metres needed for 30 banners.

Suggested answer: 60 m

b) Estimate the cost of fabric for 30 banners.

Suggested answer: $480

c) Calculate the cost of fabric for 30 banners using a calculator. Explain why your estimate was higher or lower than the exact amount.

(actual cost) $455.43   Suggested answer: $480.00 was high because the amount of fabric

was rounded up to 2 m and the cost was rounded up to $8.00.

2. Trim for the perimeter of each banner costs $2.89 for each metre. Each banner measures 1.2 m by 1.9 m. About how much will the trim cost for one banner?   *$18*

1.2 m

1.9 m
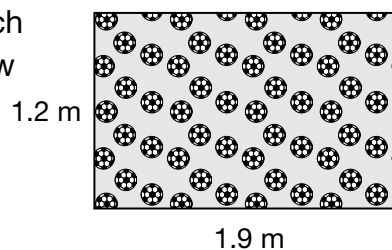
3. Estimate each product using whole numbers.

a) 8×2.6 *Suggested answer: 20*

b) 7.5×1.2 *Suggested answer: 9*

c) $5.1 \times \$4.49$ *Suggested answer: $23*

4. Mark's binder is as long as 16 pennies and as wide as 14 pennies.

What strategy would you use to estimate the dimensions of the binder? Explain.

1.8 cm

Suggested answer: Round 1.8 cm to 2 cm. Then length is 16 x 2 cm = 32 cm and width is 14 x 2 cm = 28 cm. Since the width of the penny was rounded up, take off 2 cm from each dimension of binder. So estimated length is 30 cm and estimated width is 26 cm.
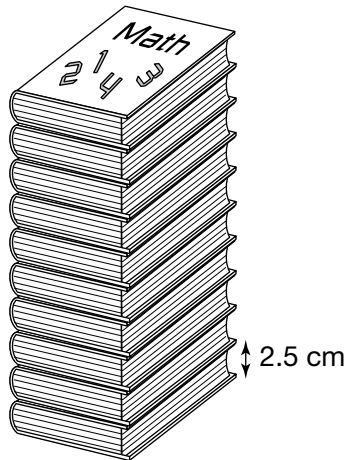
2

Multiplying by 10 or 100

Goal **Multiply decimal tenths and hundredths by 10 and 100.**

1. A math text is 2.5 cm thick. How high would a stack of 10 math texts be?
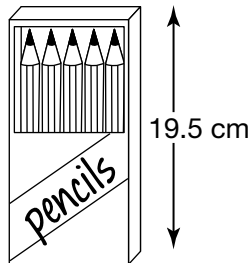
25 cm

$\updownarrow$ 2.5 cm

At-Home Help

When you multiply a decimal number by 10, the digit in the tenths place moves to the ones place. So the decimal moves one place to the right.

For example:
$6.8 \times 10 = 68$

Similarly, when multiplying a decimal number by 100, the digits in the tenths and hundredths place increase in place value. So the decimal moves two places to the right.

For example:
$4.57 \times 100 = 457$

2. A box of pencils is 19.5 cm long.

a) How long would 10 boxes placed end to end be?

195 cm or 1.95 m

19.5 cm

pencils

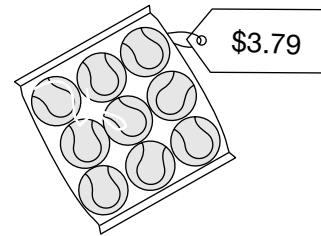**b)** How long would 100 boxes placed end to end be?

1950 cm or 19.5 m

3. A package of tennis balls costs $3.79.

a) What is the cost of 100 packages? *$379.00*

b) What is the cost of 10 packages? *$37.90*

$3.79

4. The mass of a package of tennis balls is 0.45 kg. What would the mass of 10 and 100 boxes be? Circle the correct answer.

45 kg, 450 kg　　　（4.5 kg, 45 kg）　　　4.5 g, 45 g　　　0.45 kg, 4.5 kg

CHAPTER 9

3
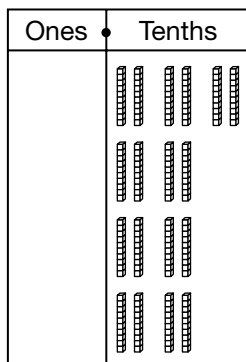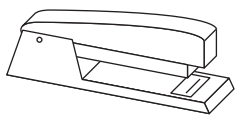
Multiplying Tenths by Whole Numbers

Goal **Multiply decimal tenths by whole numbers using models, drawings, and symbols.**
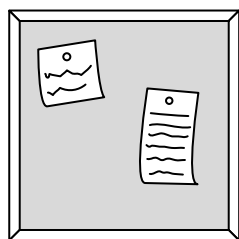
You will need base ten blocks and a ruler or tape measure.

1. The mass of a stapler is 0.2 kg. What is the mass of 9 staplers? Draw a representation using base ten blocks.
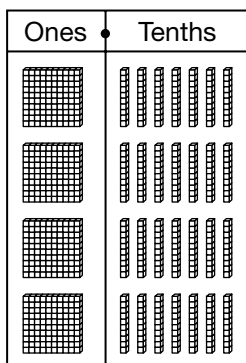
1.8 kg

Ones	Tenths

2. Mrs. Gulliver used four 1.7 m pieces of border for a bulletin board. How many metres did she use? Draw a representation using base ten blocks.
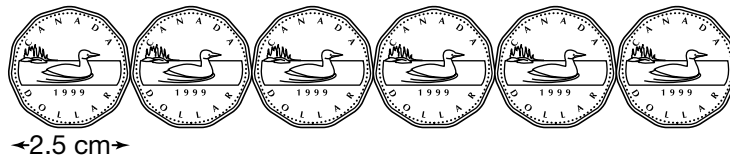
6.8 m

1.7 m

Ones	Tenths

3. Rajiv lined up six loonies. Each loonie is 2.5 cm wide. How long is the line of loonies?

15 cm

◄2.5 cm►

4. Bianca drinks 0.7 L of milk each day. How much milk does she drink in one week?   4.9 L

milk

0.7 L

5. Measure the width of this workbook to the nearest tenth of a centimetre. How long would 6 workbooks be if they were put together side by side?   21.3 cm x 6 = 127.8 cm
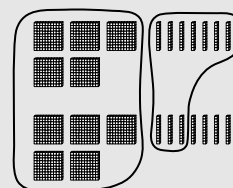

At–Home Help

When you multiply a whole number by a decimal tenth, it is like multiplying two whole numbers except you have to put in the decimal point because it is tenths.

You can use base ten blocks and estimation before multiplying. If a place value has 10 or more, regroup using the next greater place value.

For example:
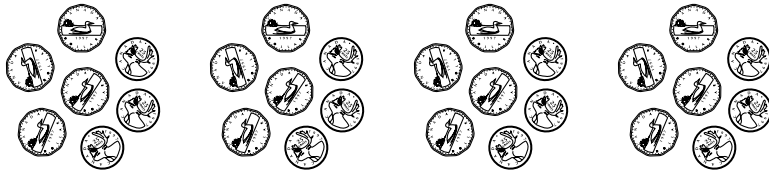$57 \times 2 = 114$
$5.7 \times 2 = 11.4$

→

CHAPTER 9

4

Multiplying Hundredths by Whole Numbers

Goal **Multiply decimal hundredths by whole numbers using models, drawings, and symbols.**

1. Neela ordered 4 tickets. Each ticket cost $4.75.
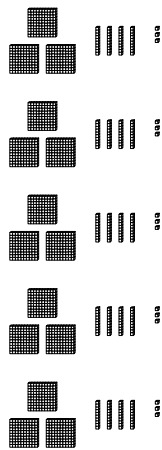
a) Calculate the total cost. $19.00

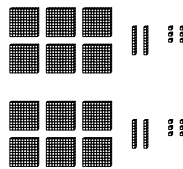**b)** How could you have predicted that the cost was less than $20.00? Explain.

Suggested answer: The price of one ticket is less

than $5.00, and $5 x 4 = $20. So the exact cost

must be less than $20.00.

2. Multiply. Draw a representation of each question using base ten blocks.

a) 3.43×5 17.15

b) 6.26×2 12.52

3. Evan cycled 6.68 km. Nadia rode twice as far on her bike. How do you know that Nadia rode more than 13 km?

Nadia rode twice as far as Evan. Half of her distance was 6.68 km.

Half of 13 km is 6.5 km. Since 6.68 is greater than 6.5, Nadia rode more than 13 km.


At-Home Help

When you multiply a whole number by a decimal hundredth, it is like multiplying two whole numbers except you have to put in the decimal point because it is hundredths.

You can use base ten blocks and estimation before multiplying. If a place value has 10 or more, regroup using the next greater place value.

For example:
$675 \times 3 = 2025$
$6.75 \times 3 = 20.25$

Answers Chapter 9: Multiplying Decimals   **83**
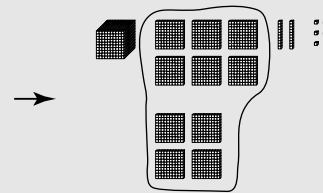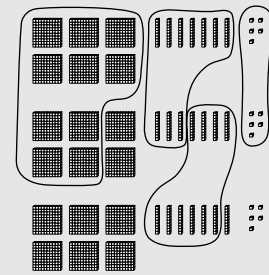
5 Communicate About Estimation Strategies

Goal **Explain estimation strategies to determine if a solution is reasonable.**

1. Each Canadian dollar is worth $0.76 US. Estimate the cost in US dollars of a software package priced at $30.00 Canadian. Explain your thinking.

Suggested answer: $22.50   *$0.76 is close to the*

fraction $\frac{3}{4}$. Half of $30.00 = $15.00 and $\frac{1}{2}$ of

$15.00 = $7.50. So $\frac{3}{4}$ of $30.00 is $15.00 + $7.50 = $22.50.

2. Use the exchange rate in Question 1. Estimate the cost in US dollars of adult and child admission to the Toronto Zoo. Admission costs in Canadian dollars are $18.00 for adults and $12.00 for children. Explain how you estimated.   *Suggested answer:*

Adult admission is about $___*$13.50*___ US.

Child admission is about $___*$9.00*___ US.

$0.76 is close to the fraction $\frac{3}{4}$. For adult admission,

half of $18.00 = $9.00 and $\frac{1}{2}$ of $9.00 = $4.50.

So $\frac{3}{4}$ of $18.00 is $9.00 + $4.50 = $13.50.

Repeat same thinking for child admission.

Half of $12.00 = $6.00 and $\frac{1}{2}$ of $6.00 = $3.00.

So $\frac{3}{4}$ of $12.00 is $6.00 + $3.00 = $9.00.

3. One euro is worth about $1.67 Canadian. Tim estimates that a book that costs 25 euros would cost about $30.00 Canadian. Explain how you would decide if this estimate makes sense.

Suggested answer: The estimate does not make sense because it is very low. If the book

was 10 euros, then it would cost $16.70 Canadian. But the book costs 25 euros, so the cost

is $16.70 + $16.70 + $8.35 = $41.75 Canadian. $41.75 is greater than $30.00.

4. A can of apple juice contains 1.36 L of juice. Serina bought 9 cans of juice. What is the best estimate of the amount of juice she bought? Circle the correct answer.

(12 L)   12.24 L   9 L   18 L

CHAPTER 9

6

Choosing a Multiplication Method

Goal   **Justify the choice of a multiplication method.**

1. If you know the cost of 10 tiles, how can you calculate the cost of 100 tiles?

10 floor tiles

_$35.99_
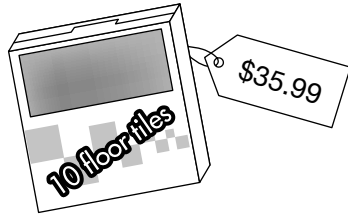
Multiply the cost of 10 tiles by 10.

2. If you know how much water to add to 1 can of juice concentrate, how can you calculate how much to add to 2 cans?

Multiply amount of water by 2.

Lemonade

Mix with 400 mL of water

At-Home Help

If numbers are simple in a question, you can use mental math. Multiplying by 10 or 100, or multiplying one-digit numbers, can be done mentally.
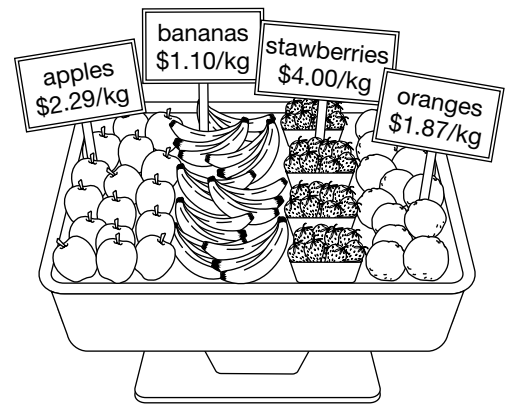
For example, $7.00 × 8 = $56.00.

If you can multiply numbers without a lot of regrouping, use pencil and paper.

For example, $5.20 × 7 = $36.40.

If you have to use a lot of regrouping to multiply, use a calculator.

For example, $6.47 × 12 = $77.64.

3. Calculate the cost of 5 kg of each fruit.

a) Which calculation(s) would you do mentally? Explain your thinking.

strawberries. It is easy to multiply

$4.00/kg by 5 mentally.

b) Which calculation(s) would you do with pencil and paper? Explain your thinking.

bananas. It is not difficult to multiply $1.10/kg by 5

with pencil and paper. There is no regrouping.

apples $2.29/kg

bananas $1.10/kg

stawberries $4.00/kg

oranges $1.87/kg

c) Which calculation(s) would you do with a calculator? Explain your thinking.

apples and oranges. Multiplying $2.29/kg by 5 and $1.87/kg by 5 would involve

several regroupings, so it is easier to use a calculator.
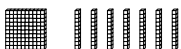
Test Yourself

Circle the correct answer.

1. What whole numbers would be best to estimate the product of 5.7 × $3.35?

   A. 5 × $3   **B.** 5 × $4   **C.** 6 × $3   **D.** 6 × $4

2. Fabric for a flag costs $7.69 for each metre. The flag is 6.3 m long. Vanessa estimated the cost by multiplying 6 × $8 = $48. How would you describe her estimate?

   A. very high   **B.** very low   **C.** close   **D.** high

3. You multiply a decimal number by 10 and the product is 55. What is the decimal number?

   A. 5.5   **B.** 55   **C.** 55.5   **D.** 0.55

4. An insect's image is 1.4 cm in length. It is enlarged to 100 times that length. What is the enlarged length?

   A. 14 cm   **B.** 140 cm   **C.** 14 m   **D.** 1.4 cm

5. A hundreds block represents 1. What multiplication question is modelled here?

   A. 1.7 × 4 = 6.8

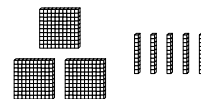   **B.** 1.7 × 4 = 5.8
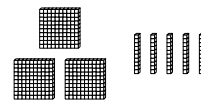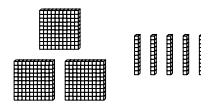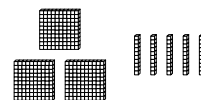
   C. 4 × 1.7 = 8.6

   D. 4 × 1.7 = 68

6. A hundreds block represents 1. This arrangement models a multiplication question. It can also show a related multiplication question. What are the two questions?

   A. 4 × 3.5 and 2 × 8

   B. 4 × 3.5 and 7 × 8

   C. 4 × 3.5 and 4 × 7

   D. 4 × 3.5 and 2 × 7

CHAPTER 9

Test Yourself Page 2

7. A binder costs $3.69 and a package of paper costs $1.49. Megan buys 3 binders and 4 packages of paper. What is the total cost before taxes?

$1.49

$3.69

Paper
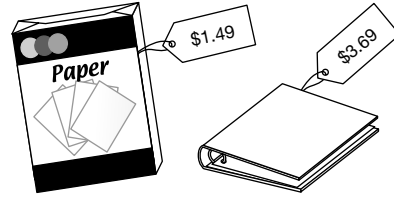
    A. $11.07   **B.** $19.23

    C. $17.03   **D.** $5.96

8. Serge cycles 0.15 km each minute. How far will he cycle in 12 minutes?

    A. 18 km   **B.** 1.8 km   **C.** 180 km   **D.** 1.5 km

9. Serge has to cycle 5 km. He cycles at a rate of 0.15 km/min. About how long will it take him to cycle 5 km?

    A. about 15 min   **B.** about 60 min   **C.** about 30 min   **D**. about 1.5 h

10. Ed has to calculate these products. He wants to do the calculations efficiently.

    (i) 6.17×11 (ii) 4.10×5 (iii) 5.32×2 (iv) 8.00×8

What methods should Ed use?

    A. (i) a calculator, (ii) pencil and paper, (iii) pencil and paper, (iv) mentally

    B. (i) mentally, (ii) a calculator, (iii) pencil and paper, (iv) a calculator

    C. (i) pencil and paper, (ii) a calculator, (iii) mentally, (iv) mentally

    D. (i) pencil and paper, (ii) mentally, (iii) mentally, (iv) a calculator

11. A package of stickers costs $3.69. How can you calculate how much 5 packages cost?

    A. Multiply $3.69 by 10.

    B. Divide $3.69 by 10.

    C. Multiply $3.69 by 5.

    D. Divide $3.69 by 5.

    Answers Chapter 9: Multiplying Decimals