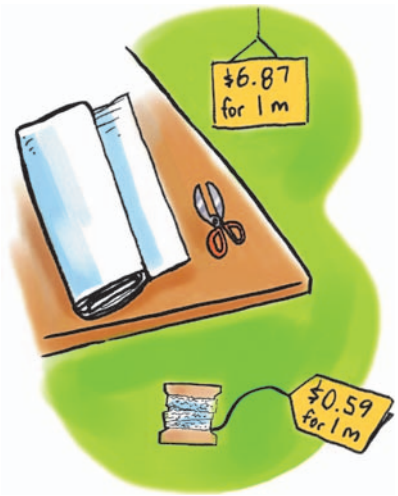
Chapter 9

Lesson 1

Estimating Products

GOAL

Estimate products of decimal numbers using whole numbers.



Samara's school is planning a multicultural evening. Nine students are going to wear Ukrainian outfits. Each outfit requires 2.2 m of fabric and 1.6 m of trim.

The students need to know how much fabric and trim to buy and how much these materials will cost.

About how much will the fabric and trim for nine outfits cost?

Samara's Estimate

To estimate the total amount of fabric,
I need to estimate 9×2.2.

I can use front-end estimation.
9×2.2 is about 9×2.

To estimate the total amount of trim,
I need to estimate 9×1.6.

I can use front-end estimation again.
9×1.6 is about 9×1.

A. How do you know that the amount of fabric needed for all nine outfits is more than 18 m but less than 27 m?

B. How do you know that the amount of trim needed for all nine outfits is more than 9 m but less than 18 m?

C. Estimate the cost of the fabric and trim for one outfit. Explain your thinking.

D. About how much will the fabric and trim for all nine outfits cost? Explain.

Reflecting

E. What is another way you could estimate the cost of the fabric and trim for all nine outfits?

Checking

1. Estimate each cost. Explain one of your estimates.

a) 8 m of fabric if 1 m costs $12.37

b) 7 m of wood if 1 m costs $2.69

Practising

2. Estimate each cost. Explain one of your estimates.

a) 3 m of this ribbon

b) 8 m of this ribbon

3. Estimate.

a) 2×7.7

b) 6×5.24

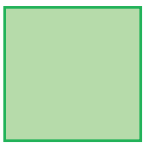
c) 3.625×8

d) 4.7×4.2

4. The record distance for pogo stick jumping is 37.18 km. The record distance for walking with a milk bottle balanced on someone's head is 130.3 km. How do you know that the record distance for walking with a milk bottle is between three and four times as far as the record distance for pogo stick jumping?

5. The length and width of each rectangle are given. Estimate each perimeter.

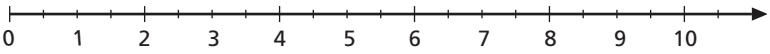
a)



b)

6. In 2008, the world's longest millipede was 38.7 cm long. About how long would four of these millipedes be? Explain.

7. a) Use a number line like the one below to show that 3×2.48 is between 6 and 9.



b) How do you know that 3×2.48 is close to 7.5?

8. Saffron is a very expensive spice. It costs about $2.29 for just 1 g. As a gift, Rupi gave her mother 8 g of saffron.

a) How do you know that the cost of the saffron was more than $16 but less than $24?

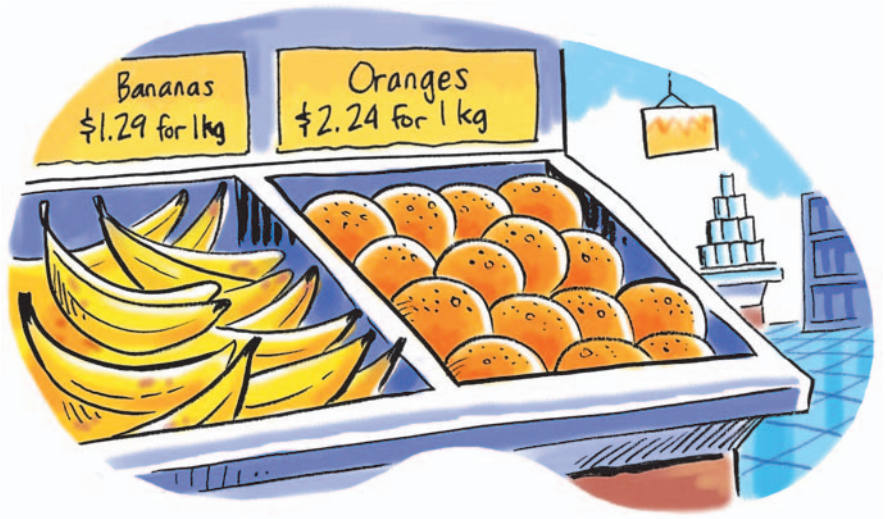
b) How do you know that the cost was close to $18?

9. How do you know that each statement is true?

a) 9×4.23 is more than 36 but less than 45.

b) 7×5.135 is more than 35 but less than 42.

10. Which costs more: 8 kg of bananas or 5 kg of oranges? How do you know?



11. Which products are between 35 and 50? Explain your thinking for one answer.

a) 8×3.97

b) 13.89×4

c) 9×4.892

d) 11.93×3

12. The estimated product of 8 and a decimal number is 32. List four possible values of the decimal number that would make this true, and explain how you chose them.

13. Why might you think of $0.69 as seven dimes to help you estimate the cost of 9 m of this wire?

14. Guy said that the best estimate for 5.79×4 is 5×4. Do you agree? Explain.