Chapter 9

Lesson 3

Multiplying Decimals by One-Digit Numbers

You will need

- base ten blocks
- a decimal place value chart

GOAL

Multiply decimal tenths, hundredths, and thousandths by one-digit numbers.

Abby bought four bags of puppy food, each with a mass of 0.432 kg.

What is the total mass of the puppy food?

Shaun's Calculation

I'll start with the thousandths.

Then I'll multiply the other parts by 4.

0.432 x 4 = (2 thousandths x 4) + (3 hundredths x 4)
+ (4 tenths x 4)

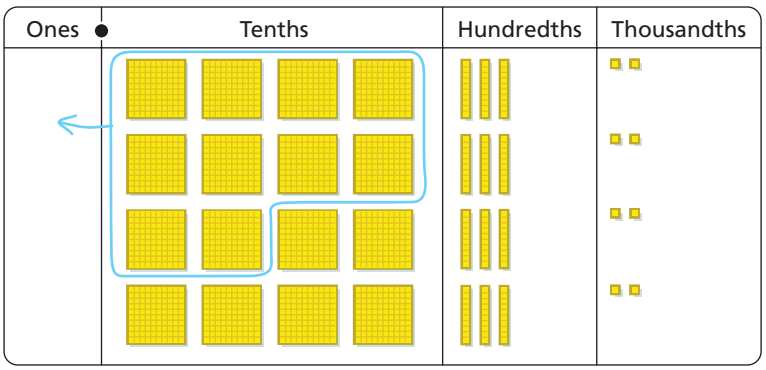
Zoe's Model

I can model the problem.

Since the mass involves thousandths, I'll use the large base ten block to represent 1. Then the small cube will represent 0.001.

I want to multiply 0.432 by 4.

I'll use a place value chart to model 4 groups of 0.432. Then I can multiply each part, starting with the tenths.



0.432
x 4
1.6 (4 x 4 tenths)

A. How might Zoe have known that $4 \times 0.4 = 1.6$?

B. Zoe started her calculation by multiplying by tenths. Why is this first step a good estimate for the total mass?

C. Complete both Zoe's and Shaun's solutions.

D. What is the total mass of the puppy food?

Reflecting

E. Why do you think the total mass of the puppy food calculated to a thousandth of a kilogram?

F. What is another way to calculate the product?

Checking

1. One bag of kitten food has a mass of 0.374 kg.

a) Estimate the total mass of nine bags of kitten food.

b) Calculate the total mass of nine bags of kitten food.

Practising

2. Each small plate of dim sum costs $3.68. Sandra and her family ordered eight small plates of dim sum. How much did the eight plates cost?

3. Alicia lined up eight paper clips.

a) How long was her line of paper clips? Explain how you calculated your answer.

b) How do you know your answer makes sense?

4. Calculate. Show your work.

a) 8×0.4

b) 9×0.123

c) 4×0.23

d) 5×1.134

Reading Strategy

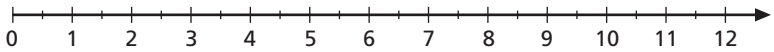
Finding Important Information

- Read the problem.
- What is the problem asking you to find out?
- What is the most important information?

5. Liam's mother built bookshelves for his room. She used three 1.3 m length boards for each shelf. She made seven shelves.

a) How many metres of wood did Liam's mother use altogether? Show your work.

b) How many extra metres of wood would she have needed if each board had been 1.35 m long instead of 1.3 m? Explain your thinking.



6. Mark is packaging ground turkey. Each package holds 0.678 kg.

a) Estimate the total mass of five packages of ground turkey.

b) Explain why your estimate makes sense. Use a number line.

c) Calculate the total mass of five packages. Show your work.

7. Gavin's cup holds 0.285 L if he fills it to the top of the design on the cup. If he drinks six cups of water filled to that level, how many litres of water does he drink?

8. Alana calculated 6×32.42 and got an answer of 1945.2.

a) How do you know her answer is incorrect?

b) What is the correct answer?

9. a) Predict which total mass is closer to 20 kg. Explain your prediction.
Mass A: six bags, each 3.514 kg
Mass B: five bags, each 4.813 kg

b) How much more is the total of Mass B than the total of Mass A?

10. Determine the missing digits.

a) $\square \times 5.28 = 2\square.\square 2$

b) $6 \times 0.\square 13 = 3.0\square\square$

11. Create a problem you could solve by multiplying 5.124 by 3. Solve your problem.

12. 5×8.1 is 1.5 less than the product of 5 and another number. What is the other number? Explain your thinking.

$$\begin{array}{r} 8.1 \\ \times\ 5 \\ \hline \end{array} \qquad \begin{array}{r} \square.\square \\ \times\ 5 \\ \hline \end{array}$$

13. How much more is 4×3.8 than 3×4.8?

14. Choose values to put in the boxes below so that when you switch the first two values, the products are between 1 and 2 apart.

$\square \times \square.\square$

15. What is the same about multiplying 6×155 and 6×0.155? What is different?