



# Student Work

Decimal Ops Problem 4.1



Problem 4.1

Write a number sentence for each question. Then answer the question.

- A** Jill wants to buy an album of music that is priced at \$7.50. The sales tax is 6%. What will be the total cost of the album?

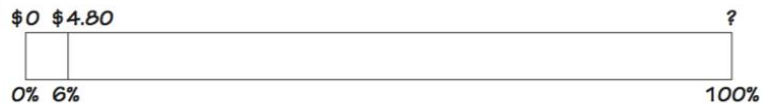
Try to find more than one way to solve this problem. Explain the different methods you find.



- B** States have different sales tax rates. Find the *total cost* of each item below.
- a \$2.00 magazine if the sales tax rate is 7%
  - a \$5.00 book if the sales tax rate is 6.5%
  - a \$.50 comic book if the sales tax rate is 7.5%

**Note:** When a percent calculation for sales tax does not come out to a whole number of cents, the standard practice is to round up the tax to the next penny.

- C** 1. Alexis bought a video game player. She does not remember the price before tax. She does know that the 6% sales tax came to \$4.80. To find the price of the game player, she drew a percent bar, or tape diagram.



2. Frank bought a new video game. The 5% sales tax was \$.75. What was the price of the game before tax?
- Draw a tape diagram to illustrate the problem.
  - Find the price (before tax) of the game. Explain how you know.

Problem 4.1 *continued*

3. Nic paid a total of \$25.68 for a game, including 7% tax. What was the price before tax?
- Draw a tape diagram to illustrate the problem.
  - Find the game price before tax. Explain how you know.
- D** After Susan did many price-plus-tax calculations, she noticed that all of the problems could be done two different ways.
- Susan said to find the total cost of a \$250 bicycle and the 7% tax, you could figure 7% of \$250 and then add that amount to \$250. The information she knows is shown on the percent bar.



Write a sentence that starts "Total cost =" to show how to use this method to find the total cost.

- The other way to do this is simply to multiply  $1.07(250)$ . Write a sentence that starts "Total cost =" to show how to use this method to find the total cost.



- Are both methods correct? Why or why not?



The photos below show the teachers charts created during the Summarize of the lesson. The teacher and students were discussing the different strategies that students used. The charts are a record of the students' thinking.



## Ways to Find the Percent of a Number

ex. cost = \$7.50  
tax = 6%

### Strategy 1

\* Work well with benchmarks

6% means 6¢ tax for every dollar

$$6¢ \times 7 \text{ (dollars)} = 42¢ \text{ (tax on \$7)}$$

50¢ is  $\frac{1}{2}$  of a dollar, so you pay 3¢ tax

$$42¢ + 3¢ = 45¢$$

↓  
tax on \$7

↓  
tax on 50¢

↓  
tax on \$7.50



Strategy 2 \* Works for any numbers

6% means \$0.06 tax per dollar

Multiply the cost by the tax written as a decimal

$$7.50 \times .06 = 0.45$$

Strategy 3 \* Works for any numbers

Write the cost and the tax as fractions and then multiplied together

$$7.50 \times .06$$
$$7\frac{1}{2} \times \frac{6}{100}$$
$$\frac{15}{2} \times \frac{6}{100}$$
$$\frac{90}{200} = \frac{45}{100} = \$0.45$$





Strategy 4 \* Works for any numbers

Divide the cost by 100 to find 1%

$$7.50 \div 100 = 0.075 \text{ (1\% of the total)}$$

Multiply 1% by 6 to get 6%

$$\begin{array}{ccc} 0.075 & \times & 6 = 0.45 \\ \text{(1\%)} & & \text{(6\%)} \end{array}$$

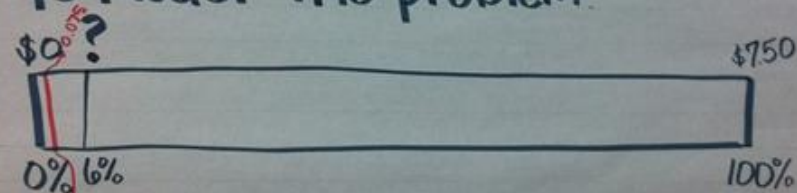
Strategy 5 \* Works for any numbers

$$\begin{array}{ccc} 100\% & \div & 6 = 16.\bar{6} \\ \text{(whole)} & \text{(6\% tax)} & \end{array} \leftarrow \begin{array}{l} \text{This means} \\ 6\% \text{ is } \frac{1}{16.\bar{6}} \text{ of} \\ \text{the whole} \end{array}$$
$$\begin{array}{ccc} 7.50 & \div & 16.\bar{6} = 0.45 \\ \text{(total cost)} & & \end{array} \leftarrow \text{Finding } \frac{1}{16.\bar{6}} \text{ of the cost}$$



## Strategy 6

Use a percent bar/tape diagram to model the problem.



$$\begin{aligned} & \rightarrow 7.50 = 100 = 0.075 \\ & \quad .075 \times 6 = 0.45 \end{aligned}$$