

Name _____

Date _____

Quantities and Descriptive Modeling – Advanced Lesson

1. You are completing a boat repair and have removed several boards from your boat. The boards that you removed were $5\frac{3}{4}$ inches wide and 27 feet long.

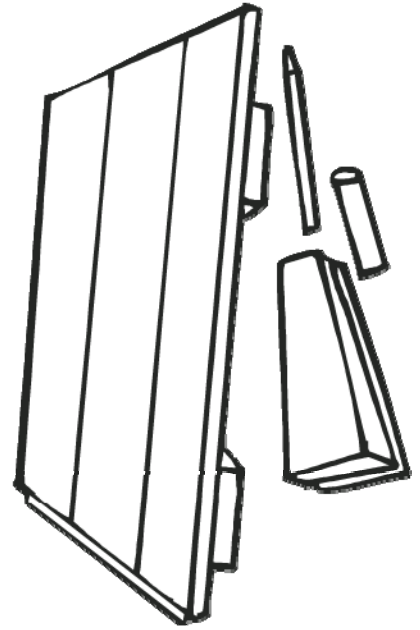
You go to the store and find the following lengths of $5\frac{3}{4}$ boards available:

6 foot - \$8.35

8 foot - \$10.40

12 foot - \$14.76

Which board lengths would you buy as replacements, while saving the most money?



2. You go to the store to buy laundry detergent. It comes in 3 sizes.

Small - 8 ounces for \$4.39

Medium - 16 ounces for \$8.21

Large - 30 ounces for \$13.99

You have \$25.00 in your pocket and want to spend it all on laundry detergent. Which sizes would give you the most laundry detergent you could buy with \$25.00?



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Solution:

1. We have to cover 27 feet. Let's first find the unit price of each board:

6 foot - \$8.35 Price per foot = $\$8.35 \div 6 = \1.39

8 foot - \$10.40 Price per foot = $\$10.40 \div 8 = \1.30

12 foot - \$14.76 Price per foot = $\$14.76 \div 12 = \1.23

You should buy the most cost-effective boards possible. Use the larger boards as much as possible because they are cheaper per unit.

Use as many 12 foot boards as possible:

12 goes into 27 twice with 3 feet left over.

27 (size to cover) – 24 (2- 12-foot boards) = 3 feet.

So we will purchase 2 -12-foot boards and we still need to cover 3 feet.

All boards will cover the three foot distance, so we want to buy the cheapest board by price (\$8.35 – 6 feet) to cover the remaining distance.

1-6 foot board would do that for us.

So our final answer is 2-12 foot boards and 1-6 foot board.

2. You can try this in a number of ways. We can see that the bigger bottles cost more, but provide us more ounces of detergent at less cost per ounce.

Now think of the ways you could make it under \$25:

5 bottles of small = 40 ounces

1 bottle of medium, 3 bottles of small = 40 ounces

2 bottles of medium, 1 bottle of small = 40 ounces

3 bottles of medium = 48 ounces

1 large bottles, 1 medium bottle = 46 ounces

1 large bottle, 2 small bottles = 46 ounces

3 bottles of medium give us the largest amount possible for \$25.00.

