



Engage NY Module 16

Lesson 16- Objective: Divide decimals using place value understanding, including remainders in the smallest unit.

Sprint – Divide by Exponents

- $1.2 \div 10^2 =$ _____
- $3 \div 10^3 =$ _____
- $4.283 \div 10^3 =$ _____
- $5.731 \div 10^4 =$ _____
- $8.04 \div 10^2 =$ _____
- $53.082 \div 10^1 =$ _____
- $9.1 \div 10^4 =$ _____
- $7.109 \div 10^4 =$ _____
- $7.109 \div 10^2 =$ _____
- $24.007 \div 10^5 =$ _____
- $24 \div 10^2 =$ _____

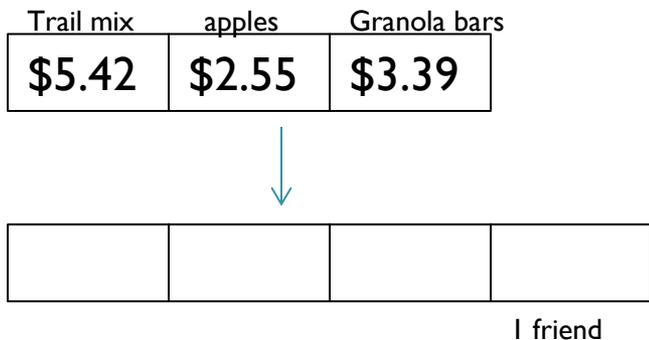
- $20.78 \div 10^3 =$ _____
- $1.2 \div 10^2 =$ _____
- $3.157 \div 10^2 =$ _____
- $30.87 \div 10^3 =$ _____
- $4.391 \div 10^4 =$ _____
- $35.082 \div 10^1 =$ _____
- $7 \div 10,000 =$ _____
- $42 \div 10^2 =$ _____
- $1.3 \div 10^3 =$ _____
- $35.8 \div 10^1 =$ _____
- $0.53 \div 10^3 =$ _____

Find the Quotient

- $0.3 \div 2 = \underline{\quad}$ (Using a place value chart and disk complete the problem.)
 - Write your answer in unit form and standard form.
 - 1 tenth 5 hundredths, .15
- $0.9 \div 5 = \underline{\quad}$ (Using a place value chart and disk complete the problem.)
 - Write your answer in unit form and standard form.
 - 15 hundredths, 1 tenth 5 hundredths, .15
- $0.58 \div 4 = \underline{\quad}$ (Using a place value chart and disk complete the problem.)
 - Write your answer in unit form and standard form.
 - 1 tenth 4 hundredths 5 thousandths, 145 thousandths, .145

Application Problem

- Jesse and three friends buy snacks for a hike. They buy trail mix for \$5.42, apples for \$2.55, and granola bars for \$3.39. If the four friends split the cost of the snacks equally, how much should each friend pay? (Note: Give final answer in a statement of solution. Use a tape diagram to help lay out the problem.)



$$\begin{array}{r} 5.42 \\ 2.55 \\ +3.39 \\ \hline \end{array}$$

$$11.36 \div 4 = 2.84$$

$$11.36$$

Concept Development – Problem 1

- Mr. Frye distributed \$126 equally among his 4 children for their weekly allowance. How much money did each child receive?
 - Who and what is the problem about?
 - Mr. Frye's money
 - Draw a bar to represent Mr. Frye's money.



- Let's reread the problem and fill in diagram.
- What is the important information in the first sentence?
 - \$126 and 4 children received equal amount.
- How can we represent this in our diagram?
 - Place a bracket above the rectangle and place \$126 above the bracket, showing the entire rectangle equals \$126.
- How many sections should the rectangle be broken into?
 - 4 equal parts, because there is 4 children all receiving the same amount.



- How can we determine how much they each received?
 - Divide \$126 by 4

Concept Development – Problem 1

- How would we write the math equation?
 - $126 \div 4 = \underline{\hspace{2cm}}$
- Why are we using division?
 - We are using division because we are starting with a whole that is being shared equally.
- Solve the problem using the standard method or a place value chart and disk.

$$\begin{array}{r} 31.5 \\ 4 \overline{) 126.0} \\ \underline{- 12} \\ 006 \\ \underline{- 4} \\ 20 \\ \underline{- 20} \\ 0 \end{array}$$

Each child will receive \$31.50 for their allowance.

Concept Development – Problem 2

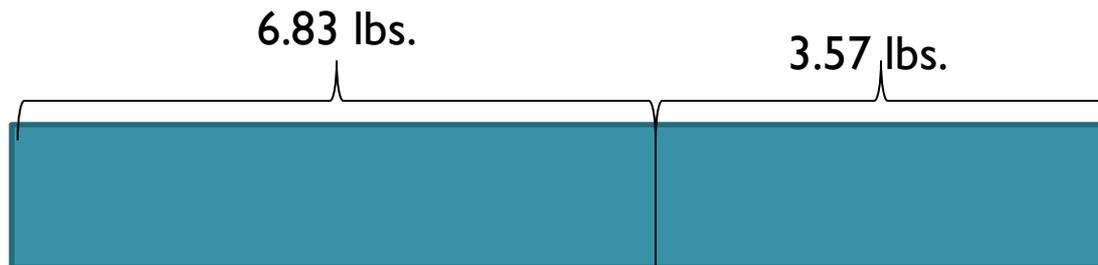
- Read the problem and identify the variables (who & what) and draw a bar (tape diagram).

Problem

- Brandon mixed 6.83 lbs. of cashews with 3.57 lbs. of pistachios. After filling up 6 bags that were the same size with the mixture, he had 0.35 lbs. of nuts left. What was the weight of each bag?

Concept Development – Problem 2

- What is the important information in this sentence?
 - 6.83 lbs. of cashews and 3.57 lbs. of pistachios.
- How can this be represented on the tape diagram (bar diagram)?
 - The tape diagram should have 2 parts inside the bar.
 - Will both parts be equal?
 - No. The cashews part should be about 2 times the size of the pistachio part.



Concept Development – Problem 2

Brandon mixed 6.83 lbs. of cashews with 3.57 lbs. of pistachios. After filling up 6 bags that were the same size with the mixture, he had 0.35 lbs. of nuts left. What was the weight of each bag?

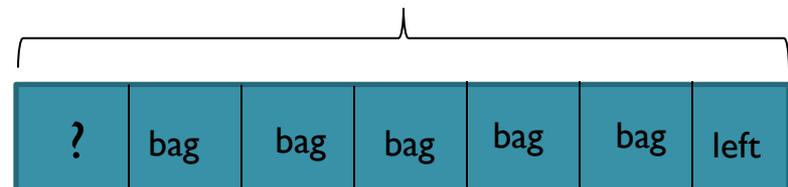
- Read the next sentence (2nd). How will we represent this part of the problem?
 - We could draw another bar to represent both kinds of nuts together and split it into parts to show the bags and the part that was left over.
 - We could erase the bar separating the nuts, put the total on the bar we already drew and split it into the equal parts, but we have to remember he had some left over.
- Now draw you tape diagram for the 2nd sentence and label each unit.
- What is the question we are answering?
 - How much did each bag weight?
- What should we put our question mark in?
 - Inside one of the units that is labeled with the word bag.

6.83 lbs.

3.57 lbs.



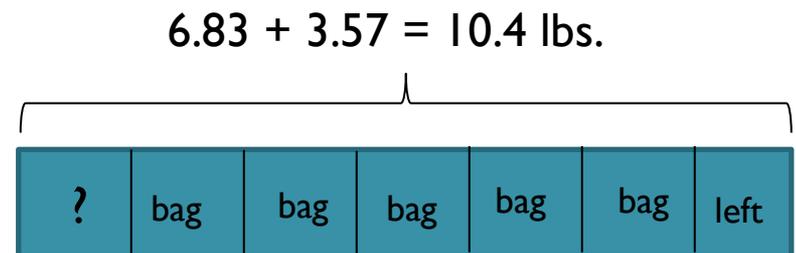
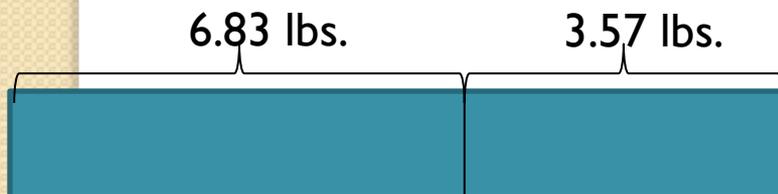
$$6.83 + 3.57 = 10.4 \text{ lbs.}$$



Concept Development – Problem 2

Brandon mixed 6.83 lbs. of cashews with 3.57 lbs. of pistachios. After filling up 6 bags that were the same size with the mixture, he had 0.35 lbs. of nuts left. What was the weight of each bag?

- How will we find 1 unit in our diagram?
 - We need to divide because we are going from a whole group to a part.
- What will we divide by?
 - 6 because the problem states there are 6 bags filled.
- Prior to dividing what should we do?
 - Remove the left over amount.
- What do we have after removing the left over?
 - $10.4 - 0.35 = 10.05$ lbs.
- What will our math problem look like?
 - $10.05 \div 6 = \underline{\hspace{2cm}}$
- Solve using the standard algorithm.
- What is your answer? Your answer should be a statement of solution.
 - Each bag of nuts weighed 1.675 lbs.



Problem Set

- Solve

1. Mr. Frye distributed \$126 equally among his 4 children for their weekly allowance.
 - a) How much money did each child receive?
 - b) John, the oldest child, paid his siblings to do his chores. If John pays his allowance equally to his brother and two sisters, how much money will each of his siblings have received in all?
2. Ava is 23 cm taller than Olivia, and Olivia is half the height of Lucas. If Lucas is 1.78 m tall, how tall are Ava and Olivia? Express their heights in centimeters.
3. Mr. Hower can buy a computer with a down payment of \$510 and 8 monthly payments of \$35.75. If he pays cash for the computer, the cost is \$699.99. How much money will he save if he pays cash for the computer instead of paying for it in monthly payments?
4. The bakery bought 4 bags of flour containing 3.5 kg each. 475 g of flour are needed to make a batch of muffins and 0.65 kg is needed to make a loaf of bread.
 - a) If 4 batches of muffins and 5 loaves of bread are baked, how much flour will be left? Give your answer in kilograms.
 - b) The remaining flour is stored in bins that hold 3 kg each. How many bins will be needed to store the flour? Explain your answer.

End of Lesson

- Debrief
- Exit Ticket