Chapter 2, Lessons 8: Adjusting Quotients

Goal: I can adjust by quotient if it is too high or too low.

Adjust Quotients

Essential Question: How can you adjust the quotient if your estimate is too high or too low?

CONNECT: When you estimate to decide where to place the first digit, you can also try using the first digit of your estimate to find the first digit of your quotient. Sometimes an estimate is too low or too high.

Divide. 3,382 ÷ 48

Estimate. 3,000 ÷ 50 = 60

Try 6 tens.

If an estimate is too low, the difference will be greater than the divisor.

48 | 3,382
- 288
- 50

Since the estimate is too low, adjust by increasing the number in the quotient.

Too Small

Divide. 453 ÷ 65

Estimate. 490 ÷ 70 = 7

Try 7 ones.

If an estimate is too high, the product with the first digit will be too large and cannot be subtracted.

65 | 453
- 455

Since the estimate is too high, adjust by decreasing the number in the quotient.

Too Big!
A new music group makes 6,127 copies of its first CD. The group sells 75 copies of the CD at each of its shows. How many shows does it take the group to sell all of the CDs?

**STEP 1** Use the estimate, 90. Try 9 tens.
- Is the estimate too high, too low, or correct? **too high**
- Adjust the number in the quotient if needed.

**STEP 2** Estimate the next digit in the quotient.
Divide the ones.
Estimate: \(140 \div 70 = 2\). Try 2 ones.
- Is the estimate too high, too low, or correct? **Correct too high**
- Adjust the number in the quotient if needed.

So, it takes the group **82** shows to sell all of the CDs.
Adjust the estimated digit in the quotient, if needed. Then divide.

1. \( 41 \div 1,546 \)
   - Quotient: \( 37 \frac{29}{41} \)
   - Remainder: \( 29 \)

2. \( 16 \div 416 \)
   - Quotient: \( 26 \)
   - Remainder: \( 96 \)

3. \( 34 \div 2,831 \)
   - Quotient: \( 83 \frac{9}{34} \)

Divide.

4. \( 19 \div 915 \)
   - Quotient: \( 48 \)
   - Remainder: \( 19 \frac{3}{19} \)

5. \( 28 \div 1,225 \)
   - Quotient: \( 65 \frac{5}{28} \)
   - Remainder: \( 145 \)

6. \( 45 \div 3,518 \)
   - Quotient: \( 78 \frac{8}{95} \)

8 \( \times \) \( \frac{9}{30} = \)

34 \( \div \) 306

102 \( \div \) 9

55 \( \div \) 20 \( = \) 27.5

20 \( \times \) 9, \( \div \) 8 = 22.5

60 \( \div \) 8 \( = \) 7.5

140 \( \div \) 145 \( = \) 1.45

78 \( \div \) 65 = 1.2153846153846154

78 \( \div \) 95 = 0.826530612244898

8 \( \times \) 8 = 64

9 \( \times \) 9 = 81

315 \( \div \) 368 = 0.8564486791666667

78 \( \div \) 360 = 0.21666666666666667

78 \( \div \) 95 = 0.826530612244898
25. A banquet hall serves 2,394 pounds of turkey during a 3-week period. If the same amount is served each day, how many pounds of turkey does the banquet hall serve each day?

- A 50,274 pounds
- B 798 pounds
- C 342 pounds
- \( \div 7 \)
- \( \div 3 \)
- \( \div \)
- 114 pounds

a. What do you need to find?
   - How many lbs of turkey they serve each DAY

b. What information are you given?
   - Every 3 weeks, serves 2,394 lbs

\[ \text{c. What other information will you use?} \]

- Same each day
- 3 weeks = 21 days

\[ \text{d. Find how many days there are in 3 weeks.} \]

- There are 21 days in 3 weeks.

\[ \text{e. Divide to solve the problem.} \]

\[ 2394 \div 3 = t \]
\[ t \div 7 = p \]
\[ 2394 \div 21 = p \]

\[ \text{f. Fill in the bubble for the correct answer choice.} \]
\[
\begin{align*}
31 & \quad 2394 \\
-21 & \quad \phantom{0} \quad \phantom{0} \quad \phantom{0} \\
\hline
& \quad 29 \\
-27 & \quad \phantom{0} \quad \phantom{0} \quad \phantom{0} \\
\hline
& \quad 24
\end{align*}
\]
$2394 \div 21$

\[
\begin{array}{r}
21 & \underline{)2394} \\
21 & \quad \underline{\times 100} \\
\hline
24 & \\
21 & \underline{-21} \\
\hline
34 & \\
34 & \underline{-34} \\
\hline
0 & \\
\end{array}
\]

$114 \times 20 = 2280$

$114 \times 1 = 114$

$2280 - 114 = 2166$

$2394 - 2166 = 228$
Goal: I can use the strategy "draw a diagram" to solve a division problem.

Problem Solving • Division

Essential Question  How can the strategy draw a diagram help you solve a division problem?

UNLOCK the Problem

Sean and his family chartered a fishing boat for the day. Sean caught a blue marlin and an amberjack. The weight of the blue marlin was 12 times as great as the weight of the amberjack. The combined weight of both fish was 273 pounds. How much did each fish weigh?
Read the Problem

What do I need to find?
I need to find how much each fish weighs.

What information do I need to use?
I need to know that Sean caught a total of 273 pounds of fish and the weight of the blue marlin was 12 times as great as the weight of the amberjack.

How will I use the information?
I can use the strategy draws a diagram and then divide. I can draw and use a bar model to write the division problem that helps me find the weight of each fish.

Solve the Problem

I will draw one box to show the weight of the amberjack. Then I will draw a bar of 12 boxes of the same size to show the weight of the blue marlin. I can divide the total weight of the two fish by the total number of boxes.

\[
\begin{array}{c}
\text{amberjack} & 21 \\
\text{blue marlin} & 21 \quad 21 \quad 21 \quad 21 \quad 21 \quad 21 \quad 21 \quad 21 \quad 21 \quad 21 \quad 21 \\
\hline
273 \\
\hline
13)273 \\
-26 \\
-13 \\
-13 \\
\hline
0
\end{array}
\]

Write the quotient in each box. Multiply it by 12 to find the weight of the blue marlin.

\[21 \cdot 10 = 210 + 21 + 21\]

So, the amberjack weighed 21 pounds and the blue marlin weighed 252 pounds.
Try Another Problem

Jason, Murray, and Dana went fishing. Dana caught a red snapper. Jason caught a tuna with a weight 3 times as great as the weight of the red snapper. Murray caught a sailfish with a weight 12 times as great as the weight of the red snapper. If the combined weight of the three fish was 208 pounds, how much did the tuna weigh?

Read the Problem

<table>
<thead>
<tr>
<th>What do I need to find?</th>
<th>What information do I need to use?</th>
<th>How will I use the information?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight of the Tuna</td>
<td>( R )</td>
<td>( R = 3R )</td>
</tr>
<tr>
<td></td>
<td>( T = 3R )</td>
<td></td>
</tr>
<tr>
<td></td>
<td>( S = 12R )</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total = 208 lbs</td>
<td></td>
</tr>
</tbody>
</table>

Solve the Problem

\[ \begin{align*}
R &= 13 \text{ lbs} \\
T &= 3 \times 13 = 39 \text{ lbs} \\
S &= 12 \times 13 = 156 \text{ lbs}
\end{align*} \]

So, the tuna weighed \( 39 \) pounds.
1. Paula caught a tarpon with a weight that was 10 times as great as the weight of a permit fish she caught. The total weight of the two fish was 132 pounds. How much did each fish weigh?

First, draw one box to represent the weight of the permit fish and ten boxes to represent the weight of the tarpon.

Next, divide the total weight of the two fish by the total number of boxes you drew. Place the quotient in each box.

Last, find the weight of each fish.

The permit fish weighed 12 pounds.

The tarpon weighed 120 pounds.

\[
\begin{align*}
132 & \div 11 = 12 \\
11 \cdot 11 &= 121 \\
+ \frac{11}{132}
\end{align*}
\]
$208 \div 3 = 69 \frac{1}{3} \text{ R 16}$

$R = 1
T = 3 \cdot R
S = (12) \cdot R$

$16 \left\lfloor \frac{208}{13} \right.$

$-16$

$\overline{48}$

$-48$
Division Draw

Draw a bar model to solve each problem.

1. Keira, Larry, and Gita picked apples at an orchard. Keira picked twice as many pounds as Larry and 3 times as many pounds as Gita. The total weight of the apples they picked was 8,360 pounds. How many pounds of apples did each person pick?

Keira ____________________________

Larry ____________________________

Gita ____________________________
2. Mark orders food for a restaurant. He orders 5 times the number of pounds of chicken as he does beef, and he orders 4 times the number of pounds of fish as beef. The total weight of the food he orders is 3,600 pounds. How many pounds of each item does Mark order?

chicken

beef

fish