Lesson 14 The Traditional Method for Dividing Decimal Numbers

Problem Solving: Choosing an Operation

The Traditional Method for Dividing Decimal Numbers

How do we use the traditional method for dividing decimal numbers?

The traditional method for dividing decimal numbers involves a shortcut that makes it easier to work with the numbers. There are three names for numbers in a division problem.

$$\begin{array}{rl} & 3 \leftarrow \text{Quotient} \\ \text{Divisor} \rightarrow & 3.4\overline{)10.2} \leftarrow \text{Dividend} \end{array}$$

Example 1 shows how we change the divisor into a whole number in order to make it easier to divide. When we move the decimal point in one number, we need to do the same thing to the other number. So, if we change the divisor, we also need to change the dividend.

Example 1

Change the place value in the divisor and the dividend by moving the decimal points.

$3.4\overline{)10.2}$	$3.4\overline{)10.2}$	changes to	$34\overline{)102}$ (3)
$0.25\overline{)15}$	$0.25\overline{)15}$	changes to	$25\overline{)1{,}500}$ (60)
$0.02\overline{)0.104}$	$0.02\overline{)0.104}$	changes to	$2\overline{)10.4}$ (5.2)
$1.2\overline{)0.156}$	$1.2\overline{)0.156}$	changes to	$12\overline{)1.56}$ (0.13)

Don't forget to change both numbers by the same amount.

How do we use good number sense when we divide decimal numbers?

Here is another exercise for thinking about decimal numbers when we divide. We did something similar when we multiplied decimal numbers in a previous lesson. Look at the problems in Example 1. There are two problems with the correct digits in the answers. Where do we put the decimal point?

Example 1

Use estimation to decide where the decimal point goes.

210.05 ÷ 6.7 = 314

- First, we round 210.05 to 210 and 6.7 to 7.
- We know that 210 ÷ 7 = 30.
- Since the answer should be around 30, we put the decimal point in place to make our answer close to 30.

The answer is 31.4.

210.05 ÷ 67 = 314

- First, we round 210.05 to 210 and round 67 to 70.
- We know that 210 ÷ 70 = 3.
- Since the answer is around 3, we put the decimal point in place to make our answer close to 3.

The answer is 3.14.

These skills are important even if we do most of our computations using a calculator. If we enter numbers incorrectly on a calculator, we need to be able to see that the answer does not make sense. So, number sense strategies help us determine if we have the correct answer.

Apply Skills
Turn to ***Interactive Text***, page 38.

Reinforce Understanding
Use the ***mBook Study Guide*** to review lesson concepts.

Problem Solving: Choosing an Operation

Which operation do we use?

There are many times in life when we have to use math. We are not told what operation to use like in the problems that we solve in math class. We have to figure out what operation to use. When this happens, we need to think carefully about the problem.

Let's look at some situations where we need to choose an operation.

Problem:

An artist wants to make a frame for her new picture. She needs to know how much frame material to buy to go all the way around the picture. What operation should she use?

Since the artist wants to know the distance around the picture, she will have to measure each side of the picture and then add the lengths together.

The operation is addition.

Problem:

Your friend wants to give every student in his class three cookies. There are 25 students in the class. Which operation should he use?

Since we want every student to have three cookies, we could use either addition or multiplication to solve the problem. To add, we would need to add 3 + 3 + 3 + . . . 25 times. This is a lot of work. It would be easier to write the multiplication problem 25 • 3 and solve it.

The operation is multiplication.

Problem-Solving Activity
Turn to ***Interactive Text***, page 39.

Reinforce Understanding
Use the ***mBook Study Guide*** to review lesson concepts.

Homework

Activity 1

Select the correct answer to each division problem.

1. 0.9 ÷ 0.3
   - **(a)** 0.27
   - **(b)** 3
   - **(c)** 0.03

2. 1.5 ÷ 0.75
   - **(a)** 0.2
   - **(b)** 0.02
   - **(c)** 2

3. 0.65 ÷ 0.5
   - **(a)** 0.13
   - **(b)** 1.3
   - **(c)** 0.013

4. 0.78 ÷ 0.02
   - **(a)** 39
   - **(b)** 3.9
   - **(c)** 0.39

Activity 2

Place the decimal point in the correct location in each of the problems to find the correct quotient.

Model 1.00 ÷ 0.5 = 020

The decimal point goes after the 2: 2.0.

1. 0.75 ÷ 0.25 = 0300
2. 0.38 ÷ 0.2 = 0190
3. 0.05 ÷ 0.5 = 0100
4. 0.27 ÷ 0.9 = 0300
5. 4.5 ÷ 0.05 = 0900

Homework

Activity 3

Select the decimal operation you would use for each of the problems. Then set up the problem and solve.

Model Tony needs to cut a board that is 0.68 inches long into 4 equal parts. How big is each part?

Answer: Division. 0.68 ÷ 4 = 0.17 inches

1. Michael and McKay had lunch together. Michael's lunch cost $3.48. McKay's lunch cost $2.56. What was the total?
2. Ellen had a doctor's appointment and had to leave work 1.5 hours early today. Her boss deducted the time from her hours for the day, which were 7.5. How much time did she get paid for that day?
3. April gets paid $7.50 per hour. If she works 9.5 hours, what is her pay?
4. Albert is trying to figure out the tip for his meal. He wants to tip 15 percent, which is the same as 0.15. His meal cost $6.25. What is the tip?
5. Elizabeth has 3.5 yards of red fabric left over from last holiday season. She needs 0.25 yards of fabric to cover each jar lid she is decorating. How many lids can she cover with the leftover fabric?

Activity 4 • Distributed Practice

Solve.

1. $\frac{1}{2} + \frac{3}{5}$
2. $\frac{3}{4} - \frac{2}{3}$
3. $\frac{1}{6} \cdot \frac{1}{2}$
4. $\frac{1}{8} \div \frac{3}{4}$
5. 1.75 + 2.38
6. 15.08 − 12.99
7. 13.5 • 0.8
8. 6.8 ÷ 0.2
9. 18.9 + 22.7 + 85.79
10. 10.5 ÷ 0.5