Learning Objectives

At the end of this lesson, you will be able to:

1. Understand and use the basic operations of the division of whole numbers.

2. Apply the use of the division of whole numbers to your job.

On your job, you see and work with whole numbers on a daily basis. In this lesson, you will learn how to divide whole numbers.

Vocabulary and Key Terms

**dividend** - The number that the divisor divides into.

**divisor** - The divisor tells how many times to separate or divide an amount.

**remainder** - When you divide, you sometimes have an amount left over. This amount is called a remainder. Use the letter R to stand for remainder. The remainder is part of the answer.

**quotient** - The answer found by division is called a quotient.

Example: \[ \frac{24}{12} = 2 \]

Remember, division facts can be read two ways: “twelve divided into twenty-four is two” and “twenty-four divided by twelve equals two.”
Prescription for Understanding

Division is the opposite math operation of multiplication. There are two division facts for every multiplication fact.

Example: from $2 \times 12 = 24$, you get:
- $24 \div 12 = 2$
- $24 \div 2 = 12$

Example: from $2 \times 4 = 8$, you get:
- $8 \div 4 = 2$
- $8 \div 2 = 4$

The symbols “$\div$” and “$/$” mean to divide. 24 divided by 12 is written as

$24 \div 12$ or $12 \div 24$

Example: $525 \div 35$

\begin{align*}
\text{Step 1.} & \quad 35 \div 525 \\
\text{Step 2.} & \quad 35 \div 525 \\
\text{Step 3.} & \quad 35 \div 525
\end{align*}

Step 1. Set up your problem, putting the number being divided (dividend) inside the frame. In this problem, 525 is being divided.

Step 2. How many times does 35 go into 5? None. Since 35 is too large to go into 5, you look at the first two digits together. How many times does 35 go into 52? One time. Put a one above the tens place and multiply 1 times 35, then subtract.

Step 3. Ask yourself whether 35 will go into 17. No. Bring down the 5. Will 35 go into 175? Yes, five times. 5 x 135 = 175. There is no remainder; 35 divides evenly into 525.
Usually, if you divide by a single digit, short division is fairly simple.

Example:  \( 680 \div 4 \)

\[
\begin{align*}
\text{Step 1.} & \quad 4 / 680 \\
\text{Step 2.} & \quad 4 / 680 \\
\text{Step 3.} & \quad 4 / 680 \\
& \quad \quad \quad 4 \\
& \quad \quad \quad \quad \quad 28 \\
& \quad \quad \quad \quad \quad \quad 28 \\
& \quad \quad \quad \quad \quad \quad \quad \quad \quad 0
\end{align*}
\]

**Step 1.** Set up the problem, putting the number being divided (dividend) inside the frame. In the problem, 680 is being divided.

**Step 2.** Ask yourself how many times will 4 go into 6. 1 time with 2 left over. Bring down your 8.

**Step 3.** How many times does 4 go into 28? 7 times with 0 left over. Lastly, 4 goes into 0, 0 times.

In division problems with a remainder, indicate the remainder as part of the answer.

Example:  \( 156 \div 9 = 17\ r3 \)

\[
\begin{align*}
\quad 17 \ r3 \\
9 / 156 \\
\quad 9 \\
\quad 66 \\
\quad 63 \\
\quad 3
\end{align*}
\]

Our quotient is 17 with remainder of 3.

Note: This answer is also written: \( 17\ 3/9 = 17\ 1/3 \)

To check a division problem, multiply the answer by the number you divided by. Then add the remainder if there is one. The result should be the number you divided into.

Example:  \( 17 \times 9 \)

\[
\begin{align*}
17 \\
\times \ 9 \\
153 \\
\quad + \ 3 \ \text{(Remainder)} \\
156
\end{align*}
\]
Division is the most difficult of the whole number operations. Many times you have to estimate and then test any possible answers. Zeros in division create extra trouble. Review the example below:

\[
\begin{array}{c}
207 \\
2691 \div 13 \\
\text{or} \\
13 \div 2691 \\
26 \\
09 \\
0 \\
91 \\
91 \\
0
\end{array}
\]

The zero in the answer above holds the tens place. This zero means that 13 would not divide into 9.

Check by multiplication:

\[
\begin{array}{c}
207 \\
\times 13 \\
621 \\
207 \\
2,691
\end{array}
\]
Skill Check

Try the following problems:

1. $6 \div 186$
2. $31 \div 674$
3. $29 \div 684$

4. $41 \div 678$
5. $65 \div 5,708$
6. $29 \div 678$

7. $45 \div 569$
8. $22 \div 7,010$
9. $9 \div 156$

10. $28 \div 170$

Fill in the missing quotients in the problems below. Your answers should be the number that if multiplied by the divisor equal the dividend.

11. $9 \div 1 = ____$
20. $18 \div 2 = ____$
29. $27 \div 3 = ____$

12. $8 \div 1 = ____$
21. $16 \div 2 = ____$
30. $24 \div 3 = ____$

13. $7 \div 1 = ____$
22. $14 \div 2 = ____$
31. $21 \div 3 = ____$

14. $6 \div 1 = ____$
23. $12 \div 2 = ____$
32. $18 \div 3 = ____$

15. $5 \div 1 = ____$
24. $10 \div 2 = ____$
33. $15 \div 3 = ____$

16. $4 \div 1 = ____$
25. $8 \div 2 = ____$
34. $12 \div 3 = ____$

17. $3 \div 1 = ____$
26. $6 \div 2 = ____$
35. $9 \div 3 = ____$

18. $2 \div 1 = ____$
27. $4 \div 2 = ____$
36. $6 \div 3 = ____$

19. $1 \div 1 = ____$
28. $2 \div 2 = ____$
37. $3 \div 3 = ____
<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
<th>Problem</th>
<th>Solution</th>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>38. 36 ÷ 4</td>
<td>____</td>
<td>47. 45 ÷ 5</td>
<td>____</td>
<td>56. 54 ÷ 6</td>
<td>____</td>
</tr>
<tr>
<td>39. 32 ÷ 4</td>
<td>____</td>
<td>48. 40 ÷ 5</td>
<td>____</td>
<td>57. 48 ÷ 6</td>
<td>____</td>
</tr>
<tr>
<td>40. 28 ÷ 4</td>
<td>____</td>
<td>49. 35 ÷ 5</td>
<td>____</td>
<td>58. 42 ÷ 6</td>
<td>____</td>
</tr>
<tr>
<td>41. 24 ÷ 4</td>
<td>____</td>
<td>50. 30 ÷ 5</td>
<td>____</td>
<td>59. 36 ÷ 6</td>
<td>____</td>
</tr>
<tr>
<td>42. 20 ÷ 4</td>
<td>____</td>
<td>51. 25 ÷ 5</td>
<td>____</td>
<td>60. 30 ÷ 6</td>
<td>____</td>
</tr>
<tr>
<td>43. 16 ÷ 4</td>
<td>____</td>
<td>52. 20 ÷ 5</td>
<td>____</td>
<td>61. 24 ÷ 6</td>
<td>____</td>
</tr>
<tr>
<td>44. 12 ÷ 4</td>
<td>____</td>
<td>53. 15 ÷ 5</td>
<td>____</td>
<td>62. 18 ÷ 6</td>
<td>____</td>
</tr>
<tr>
<td>45. 8 ÷ 4</td>
<td>____</td>
<td>54. 10 ÷ 5</td>
<td>____</td>
<td>63. 12 ÷ 6</td>
<td>____</td>
</tr>
<tr>
<td>46. 4 ÷ 4</td>
<td>____</td>
<td>55. 5 ÷ 5</td>
<td>____</td>
<td>64. 6 ÷ 6</td>
<td>____</td>
</tr>
<tr>
<td>65. 63 ÷ 7</td>
<td>____</td>
<td>74. 81 ÷ 9</td>
<td>____</td>
<td></td>
<td></td>
</tr>
<tr>
<td>66. 56 ÷ 7</td>
<td>____</td>
<td>75. 72 ÷ 9</td>
<td>____</td>
<td></td>
<td></td>
</tr>
<tr>
<td>67. 49 ÷ 7</td>
<td>____</td>
<td>76. 63 ÷ 9</td>
<td>____</td>
<td></td>
<td></td>
</tr>
<tr>
<td>68. 42 ÷ 7</td>
<td>____</td>
<td>77. 54 ÷ 9</td>
<td>____</td>
<td></td>
<td></td>
</tr>
<tr>
<td>69. 35 ÷ 7</td>
<td>____</td>
<td>78. 45 ÷ 9</td>
<td>____</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70. 28 ÷ 7</td>
<td>____</td>
<td>79. 36 ÷ 9</td>
<td>____</td>
<td></td>
<td></td>
</tr>
<tr>
<td>71. 21 ÷ 7</td>
<td>____</td>
<td>80. 27 ÷ 9</td>
<td>____</td>
<td></td>
<td></td>
</tr>
<tr>
<td>72. 14 ÷ 7</td>
<td>____</td>
<td>81. 18 ÷ 9</td>
<td>____</td>
<td></td>
<td></td>
</tr>
<tr>
<td>73. 7 ÷ 7</td>
<td>____</td>
<td>82. 9 ÷ 9</td>
<td>____</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Now select your area of work and then turn to the appropriate page for “Let’s Apply to Your Workplace” questions:
Nursing Assistant ---------------------- Page 117 - 118
Dietary Services  -----------------------  Page 119 - 120
Environmental Services --------------- Page 121 - 122
Nursing assistants divide using whole numbers in many tasks. One task is in determining the amount of supplies needed.

**Example**

The nurse asked you to find out whether there are enough syringes on hand for the next week. If there are 156 syringes in the supply cabinet and you will need 26 per day, how many days supply are on hand?

Since $152 \div 26$ is 6, there will not be enough to last for the next week, 7 days.
Exercise

1. The nursing facility where you work uses thermometers that are used once and thrown away. If there are 392 thermometers on hand and you will need 7 for each resident during the next week, how many residents will you be able to take temperatures on for the next week?
   a. 65
   b. 56
   c. 45
   d. 54

2. There are 506 syringes on hand in the stock room. If you normally use 46 syringes per day, how many days supply do you have on hand?
   a. 10
   b. 12
   c. 11
   d. 14

3. As a nursing assistant, you are required to make hourly bed checks. A typical bed check requires three minutes to complete. How many bed checks can you complete in 60 minutes?
   a. 10
   b. 20
   c. 15
   d. 4
Dietary Services workers use division of whole numbers in many tasks. One example includes the monitoring of can goods in the pantry closet.

**Example**

You receive a shipment of 240 cans of green beans. An equal number of cans are stored on each of three shelves. How many cans will be stored on each shelf?

- a. 60
- b. 70
- c. 80
- d. 90

Total number of cans 240
Total number of shelves available \( \div 3 \)

80

Divide 240 cans of green beans by 3 (shelf space).

The answer is 80 cans stored on each shelf.
Exercise

1. You are required to deliver 80 trays of food for the breakfast meal. If your food cart can hold only 24 trays, how many trips must be made with the cart?
   a. 4
   b. 5
   c. 3
   d. 1

2. You have 112 pieces of chicken to bake in the oven. The trays can hold 26 pieces each. How many trays must be prepared?
   a. 4
   b. 5
   c. 6
   d. 7

3. If a cake recipe requires 14 eggs and you have 70 eggs, how many cakes can be prepared?
   a. 10
   b. 5
   c. 7
   d. 4
Let’s Apply to Environmental Services
Mathematics - Lesson 5 of 7

Environmental Services workers divide using whole numbers when inventorying supplies and linens, restocking supplies, and distributing briefs and personal clothing to residents.

Example

When working in the laundry area, the worker must determine how many washer loads will be required. The procedures for loading washers and dryers state that there is a maximum of 90 wash cloths per washer load. You have 180 wash cloths to launder.

How many washers or wash loads will the task require?

a. 4  
b. 3  
c. 2  
d. 5

Since 180 wash cloths divided by a maximum 90 wash cloths per washer load is 2, the correct answer is “c.”
Exercise

1. You are working as a housekeeper changing linens in residents’ rooms. If there are 140 pillow covers on hand in the linen closet, and you need 2 pillow covers per room, how many rooms will you be able to change?
   a. 70
   b. 50
   c. 60
   d. 35

2. You are working in the laundry area laundering wash cloths. If you have 180 wash cloths to dry and the maximum number per load is 45 wash cloths, how many dryer loads will be required?
   a. 2
   b. 4
   c. 6
   d. 5

3. You are working in the laundry area and have 25 wash loads to wash. If you have five washers to use, how many cycles of five will it take to wash all 25 loads?
   a. 10
   b. 5
   c. 15
   d. 4