Division Procedure

Extend Your Learning
Answers and Explanations

Solve each of the following problems. Be careful, not all of the situations represent division problems.

1. A cheetah runs at a speed of 112 kilometers per hour. A chicken runs at a speed of 14 kilometers per hour. About how many times faster is the cheetah than the chicken?

   This problem compares the cheetah's speed and the chicken's speed. Since we want to find out how many times faster the cheetah is than the chicken, we want to find what number times 14 equals 112 (? x 14 = 112). We can use division to find this number (112 ÷ 14 = 8). The cheetah is 8 times faster than the chicken.

   ```
      8
   14)112
      112
      ---
        0
   ```

   Mental Strategy:
   Ten groups of 14 is 140 (too many), and 5 groups of 14 is one half of 140 or 70. Two groups of 14 is 28, so seven groups is 70 + 28 or 98. Then one more group of 14 brings you to 112. So, 8 groups of 14 is 112.

2. A hunting dog can run about three times as fast as a wild turkey. A wild turkey can run at a rate of 24 kilometers per hour. What is the speed of a hunting dog?

   This problem compares the speed of hunting dog to the speed of a wild turkey. The hunting dog can run 3 times as fast as the wild turkey and a wild turkey's speed is 24 kilometers per hour. Multiply three times the wild turkey's speed to find the speed of the hunting dog (3 x 24 = 72). The hunting dog can run about 72 kilometers per hour.

   ```
     1
    24
   x 3
    72
   ```

   Mental Strategy:
   3 x 20 = 60 3 x 4 = 12 60 + 12 = 72

3. Dixie rides her bike to work whenever it isn't raining. She rode her bike to work 21 days in September. She lives 7 miles from work. How many miles did she put on her bike riding to and from work each day?

   Since Dixie lives 7 miles from work, she rides her bike 14 miles each day. She rode her bike 21 days, so she rode 21 x 14 miles, or 294 miles during September.

   ```
     14
   x 21
     14
   280
   294
   ```

   Mental Strategy:
   Dixie rode her bike 7 miles to work each of 21 days.
   7 x 20 = 140 7 x 1 = 7 140 + 7 = 147
   She also rode her bike home each day, so double the number of miles or find 2 x 147.
   2 x 140 = 280 2 x 7 = 14 280 + 14 = 294

4. Jared traveled 475 miles on the interstate in approximately 8 hours. What was his average speed? Round your answer to the nearest whole number.

We want to find the average speed, so divide 485 into 8 equal groups. Each group represents one hour (475 ÷ 8 = 59 R 3). If Jared traveled 59 miles per hour for 8 hours, he would have traveled only 472 miles. If he traveled at 60 miles per hour, he would have traveled 480 miles. 475 is closer to 472 than it is to 480, so Jared's average speed rounded to the nearest whole number was about 59 miles per hour.

Division Procedure Thinking:

- Share the hundreds. In order to divide the hundreds into 8 groups, think of each hundred as 10 tens (4 hundreds = 40 tens). There are a total of 47 tens.
- Share the tens. Think of putting 5 tens in each group. Eight times 5 tens is 40 tens. There are 7 tens and 5 ones or 75 left to share.
- Share the ones. Think of putting 9 in each group. Eight times 9 equals 72. There are 3 left.

```
  59
8)475
 40
 75
 72
  3
```

5. A Peregrine falcon can fly about 18 times faster than a bat and about 6 times faster than a sparrow. A Peregrine falcon can fly at a speed of 216 miles per hour. What is the speed of a bat? What is the speed of a sparrow? How can you find the speed of a sparrow without using division?

This problem compares the speed of a falcon to the speed of a bat and a sparrow. Since a falcon can fly about 18 times faster than a bat, we know 18 times the speed of the bat equals 216, the speed of the falcon (18 x ? = 216). We can solve this by dividing 216 by 18 (216 ÷ 18 = 12). The speed of a bat is about 12 miles per hour.

Division Procedure Thinking:

- Share the hundreds. In order to divide the hundreds into 18 groups, think of each hundred as 10 tens (2 hundreds = 20 tens). There are a total of 21 tens.
- Share the tens. Think of putting 1 ten in each group. Eighteen times 1 ten is 18 tens. There are 3 tens and 6 ones or 36 left to share.
- Share the ones. Think of putting 2 in each group. Eighteen times 2 equals 36.

```
  12
18)216
 18
 36
 36
  0
```

Similarly, the falcon flies about 6 times faster than a sparrow (216 ÷ 6 = 36). The speed of a sparrow is about 36 miles per hour.

Division Procedure Thinking:

- Share the hundreds. In order to divide the hundreds into 6 groups, think of each hundred as 10 tens (2 hundreds = 20 tens). There are a total of 21 tens.
- Share the tens. Think of putting 3 tens in each group. Six times 3 tens is 18 tens. There are 3 tens and 6 ones or 36 left to share.
- Share the ones. Think of putting 6 in each group. Six times 6 equals 36.

```
  36
6)216
 18
 36
 36
  0
```

You can find the speed of a sparrow without dividing, if you notice the relationship between the bat's speed and the sparrow's speed. The falcon flies 18 times faster than the bat and 6 times faster than the sparrow. Therefore, the sparrow flies 3 times as fast as the bat. If the bat's speed is 12 miles per hour, then the sparrow's speed is 3 x 12 or 36 miles per hour.

6. Sherman wants to ride his bike from the Missouri river to the Mississippi river. The route he selects is 462 miles long. How many miles must he average each day if he wants to complete the trip in seven days? How many extra miles must he average each day if he wants to complete the trip in six days?

Sherman wants to ride the same number of miles each day, so share 462 miles among 7 days (462 ÷ 7 = 66). Sherman needs to travel a total of 66 miles each day to complete the trip in seven days.

Division Procedure Thinking:

- Share the hundreds. In order to divide the hundreds into 7 groups, think of each hundred as 10 tens (4 hundreds = 40 tens). There are a total of 46 tens.
- Share the tens. Think of putting 6 tens in each group. Seven times 6 tens is 42 tens. There are 4 tens and 2 ones or 42 left to share.
- Share the ones. Think of putting 6 in each group. Seven times 6 equals 42.

```
  66
7)462
 42
 --
  42
  42
 --
   0
```

If Sherman wants to complete the trip in six days, divide 462 by 6 days (462 ÷ 6 = 77). Sherman needs to travel a total of 77 miles each day to complete the trip in six days. That is an additional 11 miles each day.

Division Procedure Thinking:

- Share the hundreds. In order to divide the hundreds into 6 groups, think of each hundred as 10 tens (4 hundreds = 40 tens). There are a total of 46 tens.
- Share the tens. Think of putting 7 tens in each group. Six times 7 tens is 42 tens. There are 4 tens and 2 ones or 42 left to share.
- Share the ones. Think of putting 7 in each group. Six times 7 equals 42.

```
  77
6)462
 42
 --
  42
  42
 --
   0
```

Another Strategy:

Sherman needs to travel a total of 66 miles each day to complete the trip in seven days. If he wants to complete the trip in 6 days, he would need to share the 66 miles from one of the days among the 6 days of his trip (66 ÷ 6 = 11). Sherman would need to ride 11 additional miles each day. Sherman needs to ride an average of 77 miles each day to complete the trip in six days.