

## Lesson 15: The Division Algorithm—Converting Decimal Division into Whole Number Division Using Mental Math

### Classwork

#### Opening Exercises

Start by finding the quotient of 1,728 and 32.

What would happen if we multiplied the divisor by 10?  $1,728 \div 320$

What would happen if we multiplied the dividend by 10?  $17,280 \div 32$

What would happen if we multiplied both the divisor and dividend by 10?  $17,280 \div 320$

What would happen if we multiplied both the divisor and dividend by 100?  $172,800 \div 3200$

What would happen if we multiplied both the divisor and the dividend by 1,000, 10,000 or 100,000? What do you predict will happen?

How can we use this to help us divide when there are decimals in the divisor? For example, how can we use this to help us divide 172.8 and 3.2?

**Example 1**

Using our discoveries from the discussion, let's divide 537.1 by 8.2.

How can we rewrite this problem using what we learned in Lesson 14?

How could we use the short cut from our discussion to change the original numbers to 5,371 and 82?

**Example 2**

Now let's divide 742.66 by 14.2.

How can we rewrite this division problem so that the divisor is a whole number, but the quotient remains the same?

**Exercises**

Students will participate in a game called Pass the Paper. Students will work in groups of no more than four. There will be a different paper for each player. When the game starts, each student solves the first problem on his paper and passes the paper clockwise to the second student, who uses multiplication to check the work that was done by the previous student. Then, the paper is passed clockwise again to the third student, who solves the second problem. The paper is then passed to the fourth student, who checks the second problem. This process continues until all of the questions on every paper are complete or time runs out.