

FAMILY MATH

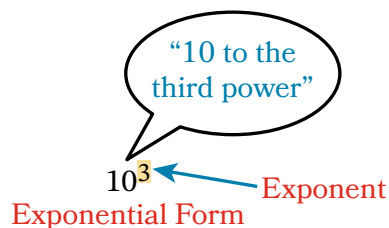
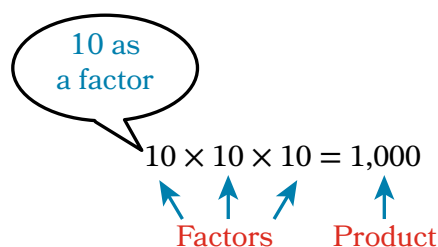
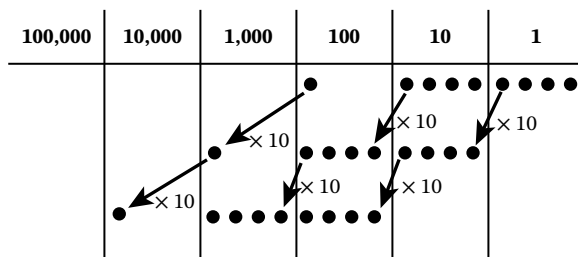
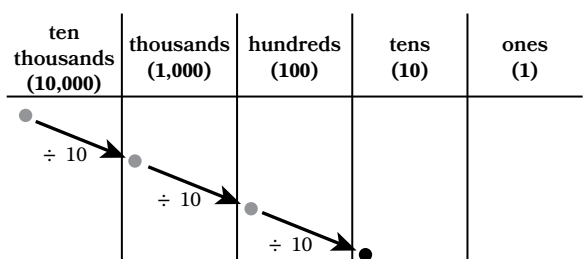
Place Value Understanding for Whole Numbers

Dear Family,

Your student is learning to multiply and divide by 10, 100, and 1,000. They begin by representing multiplication and division on the place value chart. Students recognize patterns in products and quotients, which prepares them to calculate mentally. They write repeated multiplication by using exponents and explore how powers of 10 relate to place value and metric units. Your student solves problems by converting between metric measurements and describing the relationships between the units.

Key Terms

centigram	kiloliter
centiliter	milligram
exponent	millimeter
exponential form	power of 10



The place value chart shows each place value unit is 10 times as much as the unit to its right. This understanding can be applied to multiplying and dividing by powers of 10.

When multiplying by 10, digits shift to the left. When dividing by 10, digits shift to the right.

kilometer, meter, centimeter, millimeter

longest ← → shortest

1 meter = 100 centimeters

1 meter = 1,000 millimeters

1 kilometer = 1,000 meters

kilogram, gram, centigram, milligram

heaviest ← → lightest

1 gram = 100 centigrams

1 gram = 1,000 milligrams

1 kilogram = 1,000 grams

kiloliter, liter, centiliter, milliliter

greatest capacity ← → least capacity

1 liter = 100 centiliters

1 liter = 1,000 milliliters

1 kiloliter = 1,000 liters

Students use powers of 10 to understand relationships between metric units and to solve problems.

At-Home Activity

Would You Rather?

Help your student practice converting metric units by asking “Would you rather” questions. For example, you could ask some of the following questions, replacing the pizza, chocolate milk, or scooter with your student’s favorite items. As they answer each question, have them explain why.

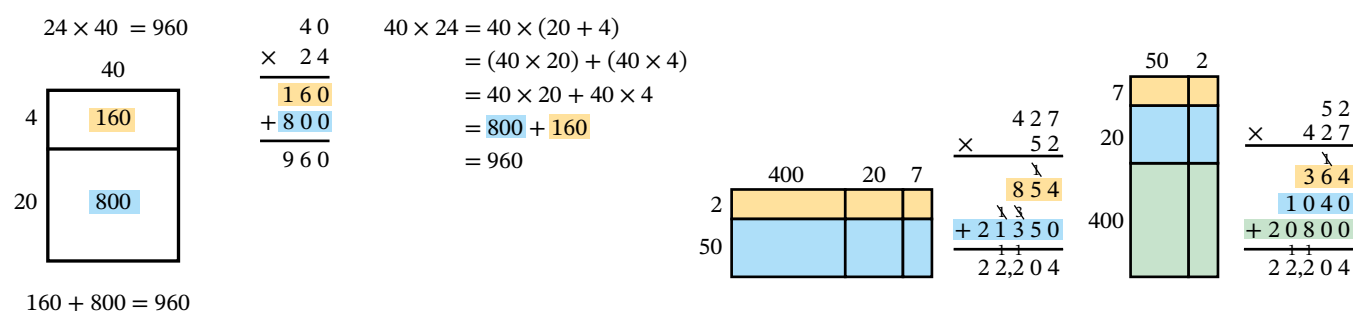
- “Would you rather eat 100 grams of pizza or 10,000 centigrams of pizza?”
- “Would you rather drink 1 liter of chocolate milk or 1,000 milliliters of chocolate milk?”
- “Would you rather ride on a scooter for 5 kilometers or ride on a scooter for 500,000 centimeters?”

FAMILY MATH

Multiplication of Whole Numbers

Dear Family,

Your student is learning to multiply whole numbers more efficiently. They use models and methods from earlier grades such as area models, break apart and distribute, partial products, and the standard algorithm. Your student multiplies multi-digit numbers and makes connections between different strategies. These connections support their work using the standard algorithm to multiply larger numbers.



Different methods can be used to solve the same multiplication problem. In each method factors are decomposed, each part is multiplied, and the partial products are added to find the total.

The number of rows in the area model is the same as the number of partial products in the standard algorithm.

At-Home Activity

How Many Hours Away?

Help your student use multiplication to calculate the number of hours until a fun event. Ask your student to think of an event they are looking forward to such as their birthday, a holiday, a vacation, or a family gathering. Encourage them to choose something that is at least 1 month away. Figure out how many days there are until the event and multiply that number by the number of hours in a day, as in the following example.

- There are 43 days until a family reunion.
- Multiply the number of days until the event by the number of hours in a day:
 $43 \times 24 = 1,032$.
- Next, add on any remaining hours left today to find the total number of hours until the event. For example, if it is 5:00 p.m., there are 7 more hours left in the day. Find $1,032 + 7$ to determine there are 1,039 hours until the family reunion.

For an additional challenge, have your student find the number of minutes until the event.

- Multiply the number of hours until the event by the number of minutes in an hour:
 $1,039 \times 60 = 62,340$. There are 62,340 minutes until the family reunion.

FAMILY MATH

Division of Whole Numbers

Dear Family,

Your student is learning to find quotients of multi-digit dividends and divisors. Earlier in grade 4, they used a variety of methods to solve division problems with one-digit divisors. Now in grade 5, your student uses these familiar methods to divide by a two-digit divisor. They use area models to help them solve and understand the vertical form of division. They also use familiar estimation strategies that help them determine whether their answers make sense. Students solve word problems and explain the meaning of quotients and remainders, which is important later in grade 5 when they solve multi-step word problems.

Key Term

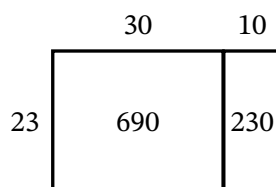
dividend

$$\begin{array}{r} 360 \div 40 = 9 \\ \text{Dividend} \quad \text{Divisor} \quad \text{Quotient} \end{array}$$

$$\begin{array}{r} 9 \\ 40 \overline{) 360} \\ \underline{- 360} \\ 0 \end{array}$$

$$926 \div 23$$

Area Model



$$\begin{array}{r} 690 \\ + 230 \\ \hline 920 \end{array}$$

$$926 - 920 = 6$$

Quotient: 40

Remainder: 6

Vertical Form

$$\begin{array}{r} 10 \\ 30 \overline{) 926} \\ \underline{- 690} \\ 236 \\ \underline{- 230} \\ 6 \end{array}$$

Estimates:
 $900 \div 30 = 30$
 $230 \div 23 = 10$

Quotient: 40

Remainder: 6

The total, or number being divided, in a division problem is the dividend. The number of groups or the size of the group is the divisor. The answer to the division problem is the quotient.

Using an area model next to the vertical form of division helps students understand how the numbers relate to each other. Eventually students will rely on the vertical form as their primary method for solving division problems.

At-Home Activity

Division Situations

Look for opportunities to help your student divide with multi-digit numbers in everyday life. Depending on the situation, they can estimate to find the approximate quotient, use a written method to find the exact quotient, or both. Talk about what the quotients and the remainders mean, and how your student knows an answer makes sense.

- Find packages of paper towels or toilet paper at the store or in an advertisement that have 10 or more rolls in the package. Look for the total amount of square feet on the label. Ask your student to divide the total square feet by the number of rolls in the package to find how many square feet are in each roll.
- Research to find the amount of money people in different careers earn in a year. Ask your student to determine the amount of money each of their classmates would get if that quantity were shared equally among them.

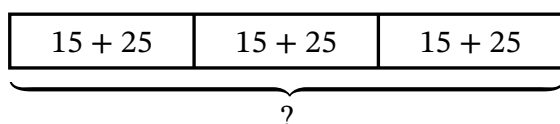
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Multi-Step Problems with Whole Numbers

Dear Family,

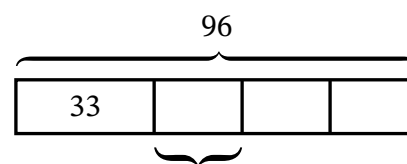
Your student is learning how the operations addition, subtraction, multiplication, and division are used in real-world situations. They draw and analyze tape diagrams to see how statements and expressions are related. Then they write word problems to match an expression or tape diagram. They explore how placing parentheses in an expression can change its value. Your student uses operations with whole numbers to solve multi-step word problems. They see there are multiple ways to draw a model to represent a problem.

3 times the sum of 15 and 25



$$3 \times (15 + 25)$$

The statement, tape diagram, and expression all represent the same mathematical relationship. The parentheses in the expression correspond to the groups shown in the tape diagram.



Sample:

Blake makes 96 muffins for the bake sale. He sells 33 of them and puts the remaining muffins in 3 containers to take home. If he puts the same number of muffins in each container, how many muffins are in each?

The sample shows a word problem that can be represented by this tape diagram. As long as the relationship between the numbers stays the same, the context of the problem can change.

At-Home Activity

Birthday Word Problem

Have your student write their birthday or another important date in number form by using four digits for the year. Ask them to use the numbers in the date to create an expression that includes two different operations (+, −, ×, or ÷) and parentheses.

- For the date August 19, 2011, your student would write an expression with the numbers 8, 19, and 2,011 such as $2,011 - (8 \times 19)$.

Then have them write a word problem that matches their expression.

- A word problem to match $2,011 - (8 \times 19)$ is: I scored 2,011 points in my video game. Then I got to the last level. I tried to pass the level and failed 8 times. Each time I tried to pass the level and failed, I lost 19 points. How many points do I have now?

Finally, they can evaluate the expression and solve their word problem.

- $$\begin{aligned} 2,011 - (8 \times 19) &= 2,011 - 152 \\ &= 1,859 \end{aligned}$$

I have 1,859 points now.