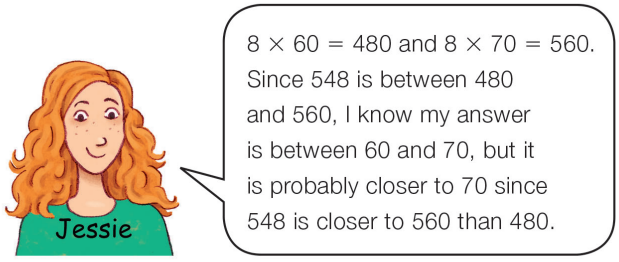
LETTER HOME

Division and Data

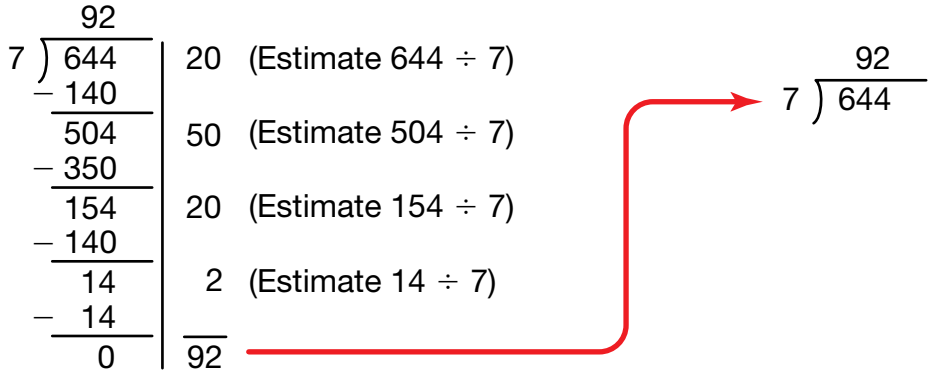
Dear Family Member:

In this unit your child will learn to divide large numbers by one- and two-digit divisors. Students estimate quotients (the answer to a division problem) and use their knowledge of multiplication facts and multiples of ten to find answers to problems such as 548 ÷ 8.

Students explore division using equal sharing and area models. Both ways of looking at division expand their understanding of the operation. When students have a solid understanding of division, they make fewer mistakes, retain their learning longer, and can think more flexibly to solve problems.



The paper-and-pencil method taught by *Math Trailblazers*™ for long division is called the partial quotients division method. This method builds on conceptual understanding of division. It is often easier for students to learn and is more flexible than the traditional method. Both methods involve making estimates, but the partial quotient method allows underestimates so it does not involve as much erasing and recalculating as the traditional method sometimes does. This increases accuracy. This method is easily extended to solve problems with larger divisors.



The partial quotients division method is often easier for students to learn.

Students will also apply their understanding of area to find the area of shapes with curved sides in the *Spreading Out* investigation. They will use ratios, tables, graphs, and averages to solve problems.

As we work together in class, here are some ways you can help your child at home:

- **Play the Division Digits Game.** In this game, students draw numbers for a set of Digit Cards 0–9 and place them on a division playing board. The winner makes the largest quotient. Directions are in the *Student Activity Book*.
- **Compare Strategies.** Encourage your child to show you how he or she is learning division. Show him or her your method for division. Compare them.

- **Play the Quotient Quest Game.** In this game, students practice estimating quotients. To play, they choose numbers from a double set of Digit Cards 0–9. They place their cards on a playing board to make a division problem that will have a quotient between two target numbers. The directions are in the *Student Activity Book*.
- **Learn the Partial Quotients Method.** This method is often called the Forging Method because you can underestimate and still solve the problem efficiently. The partial quotient method is described here.

Partial Quotients Method

As an example, let's divide 95 by 3. Think of dividing 95 objects, such as marbles, into groups of 3. How many groups will there be? (Or, think of putting the objects into 3 groups. How many will be in each group?) Let's estimate 20.
Since $3 \times 20 = 60$, write

95	20
− 60	
35	

Now divide the remaining 35 marbles by 3.
Let's estimate that $35 \div 3$ is about 10.
Since $3 \times 10 = 30$, write

95	20
− 60	
35	
− 30	10
5	

Since 3 "goes into" 5 one time, write

95	20
− 60	
35	10
− 30	
5	+1
− 3	
2	

Since 2 divided by 3 does not give us a whole number, there are 2 marbles left over. This is the remainder.

Add up the number of 3s we took away:
$20 + 10 + 1 = 31$. So, 95 divided by 3 is 31 with remainder 2. We write this on top of the problem, as in the traditional division method.

31R2	
95	20
− 60	
35	10
− 30	
5	+1
− 3	
2	31

As students become familiar with the partial quotients method, they make better estimates to keep the number of steps at a minimum. Below is another way to do this problem using this method. Note that this time, making the highest possible estimates (without overestimating) results in the same number of steps as the traditional method. If the highest estimate is made each time, the two methods are essentially the same.

31R2	
95	30
− 90	
5	1
− 3	
2	31

The partial quotients method allows students to underestimate as they develop their estimation skills. However, when students overestimate, they have to erase, just as with the traditional method.

Math Facts and Mental Math

This unit continues the systematic review and assessment of the multiplication and division facts.

Multiplication Facts. Students review the multiplication facts for the last six facts (4×6, 4×7, 4×8, 6×7, 6×8, 7×8) to maintain and increase fluency and to learn to apply multiplication strategies to larger numbers.

You can help your child review these facts using the flash cards that are sent home or by making a set of flash cards from index cards or scrap paper. Study facts in small groups each night and focus only on those facts that your child needs to learn. As your child goes through the flash cards, put the cards in three stacks: Facts I Know Quickly, Facts I Can Figure Out, and Facts I Need to Learn.

For Facts I Need to Learn, work on strategies for figuring them out. If there are many multiplication facts that your child still needs to learn, divide them into smaller groups of facts. Choose groups of facts that lend themselves to the use of the same strategy and focus on one group at a time.

For Facts I can Figure Out, use the flash cards to practice the facts for fluency.

For Facts I Know Quickly, help your child use mental math strategies to multiply 10s and 100s. You can also help your child extend and deepen understanding by asking him or her to choose a multiplication fact that was difficult to learn and describe strategies used for learning the fact.

Division Facts. Students review the division facts for the last six facts (4×6, 4×7, 4×8, 6×7, 6×8, 7×8) to maintain and increase fluency and to learn and apply multiplication and division strategies to larger numbers.

You can help your child review these facts using the flash cards that are sent home or by making a set of flash cards from index cards or scrap paper. Study facts in small groups each night. As your child goes through the flash cards, put the cards into three stacks: Facts I Know Quickly, Facts I Can Figure Out, and Facts I Need to Learn.

For the Facts I Need to Learn, work on strategies for figuring them out. Good strategies include:

Turn-around facts. To solve $42 \div 6$: I know $6 \times 7 = 42$, so $42 \div 6 = 7$.

Reasoning from known facts. To solve $28 \div 4$: I know $28 \div 2 = 14$ so $28 \div 4$ is half of 14 or 7.

For Facts I Can Figure Out, use the flash cards to practice the facts for fluency.

For Facts I Know Quickly, help your child use mental math strategies to divide 10s and 100s:

$$320 \div 40 = 8; \quad 4200 \div 700 = 6$$

Thank you for taking time to talk with your child about what he or she is learning in math.

Sincerely,