

Math: Grade 4, Lesson 19, Division

Lesson Focus: Division and the Distributive Property

Practice Focus: Students will focus on practicing division in order to divide numbers using the distributive property.

Objective: Students will use division to solve problems with a focus on using the distributive property.

Key Vocabulary: division, divisor, dividend, quotient, distributive property

TN Standards: 4.NBT.B.6

Teacher Materials:

- Whiteboard and markers
- Student Practice Packet

Student Materials:

- Paper and a pencil, and a surface to write on

Teacher Do	Student Do
<p><u>Opening</u> (1 min)</p> <p>Hello! Welcome to Tennessee's At Home Learning Series for math! Today's lesson is for all our 4th graders out there, though all children are welcome to tune in. This lesson is the nineteenth in our series.</p> <p>My name is ____ and I'm a ____ grade teacher in Tennessee schools! I'm so excited to be your teacher for this lesson! Welcome to my virtual classroom!</p> <p>If you didn't see our previous lesson, you can find it on the TN Department of Education's website at www.tn.gov/education. You can still tune in to today's lesson if you haven't see any of our others. But, it might be more fun if you first go back and watch our other lessons since we'll be talking about things we learned previously.</p> <p>Today we will be learning about division and the distributive property! Before we get started, to participate fully in our lesson today, you will need:</p> <ul style="list-style-type: none"> • Paper and a pencil, and a surface to write on • The student packet for Math, Grade 4, Lesson 19 which can be found at www.tn.gov/education. <p>Ok, let's begin!</p>	<p>Students get materials ready for the lesson.</p>
<p><u>Intro</u> (4 mins)</p> <p>Today we are going to solve problems using division.</p> <p>Let's start by looking at this situation:</p>	<p>This warm-up will support students' understanding of division with a multiple of 10, foreshadowing the work in the Teacher Model section.</p>


<p>For a fundraiser, the fourth-grade class sells \$480 worth of gift wrap. If each roll of gift wrap costs \$8, how many rolls did the fourth-grade class sell?</p> <p>What is this problem about? [Pause.] Great! It's about selling gift wrap for a fundraiser.</p> <p>What information do we know? [Pause.] That's right! We know that the class sells \$480 worth of gift wrap. We also know that each roll of gift wrap costs \$8.</p> <p>What are we trying to find out? [Pause.] We are trying to find out how many rolls of gift wrap the class sold.</p> <p>What strategy might you use to solve this problem? [Pause.] I'm hearing that we need to use division! Good job! We know the total amount of money raised and we need to split that amount into equal groups because each roll of gift wrap costs the same amount. How much does each roll cost? [Pause.] Right, each roll costs \$8. So we need to divide $480 \div 8$. [Write $480 \div 8$.] We can call these numbers the dividend and the divisor. The dividend is 480, the total amount of money being split into equal groups. The divisor is 8, the number in each group, or in this case, the cost per roll of gift wrap.</p> <p>We are thinking about how many times 8 goes into 480. One way to do this is to think about place value and basic division facts. We can use place value to rewrite 480 as tens. [Say and write.] $480 = 48$ tens $480 \div 8$ can be rewritten as: [Write.] $48 \text{ tens} \div 8$ Now we can use the basic division fact $48 \div 8$. Since $48 \div 8$ is 6 [Write and say.] $48 \text{ tens} \div 8 = 6 \text{ tens}$. What's another way to write 6 tens? [Pause.] You got it! 60! [Write and say.] $480 \div 8 = 60$.</p> <p>60 is our quotient, or the solution to our division problem. Think back to the question about what each of these numbers mean. [Pause.] We took the total amount of money earned, \$480, and split it equally into groups of 8, since each roll of gift wrap cost \$8. We found that the class sold 60 rolls of gift wrap.</p> <p>For the next division problems, we are going to work with numbers that are not multiples of 10.</p>	<p>Students will listen to the teacher think aloud modeling the thought process for a problem from the start of the problem through finding the solution. Students will follow along and responding to teacher questioning.</p>
<p><u>Teacher Model</u> (12 mins)</p>	<p>Students will listen to the teacher do a think aloud working a problem</p>

Objective #1: Teacher will guide students through how to solve a division problem by drawing base ten blocks.

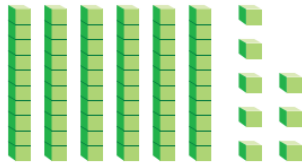
In the problem we just solved, we were able to use place value and basic division facts because the dividend was a multiple of 10. What if the dividend is not a multiple of 10? We're going to try a different strategy to divide $68 \div 4$. [Write $68 \div 4$.]

For this strategy, we're going to use drawings of base ten blocks to represent numbers. Let's practice how to draw base ten blocks. Draw with me.

To represent a one, draw a small dot or circle. [Draw.] 

To represent 1 ten, draw a straight line, or a rod. [Draw.] 
 [Draw. Note: The teacher does not need to draw the 10 rod showing all the individual ones, teacher can just draw a line. There are ten ones in the number 10, so the ten rod represents 10 ones. We're drawing a rod to make a quick picture.]

Let's draw the number 68 with base ten blocks. Draw 6 rods to represent 60, or 6 tens. Then draw 8 small dots or circles to represent 8 ones. [Draw.]



We are trying to find $68 \div 4$, or split 68 into 4 equal groups.

First, we want to think about how to share the tens equally among 4 groups. Draw four big circles on your paper to represent the 4 groups.

Draw one ten rod in each of the 4 groups. [Draw this.]

How many ten rods are not in a group yet? [Pause.]

Right, there are still two ten rods that we haven't put into groups. What do you think we should do with those two ten rods? [Pause.]

I'm hearing some great ideas! We discussed earlier that the ten rod represents 10 ones. We can regroup the 2 tens as 20 ones. Cross out two of the ten rods in your drawing and redraw them as 20 ones. [Draw this.]

Now the 20 ones can be shared equally among the 4 groups.

How many ones would be in each group? [Pause.]

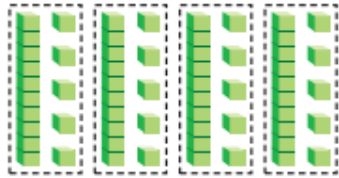
Right! $20 \div 4$ equals 5, so there will be 5 ones in each group.

modeling the thought process for a problem from the start of the problem through finding the solution.

Objective #1:

Through following along with the think aloud, students will learn how to solve a division problem by drawing base ten blocks.

To share this amount equally among 4 groups, each group will have 1 ten and 5 ones. Let's draw a picture of this. Draw 4 groups of 1 ten and 5 ones and circle each group. [Draw.]

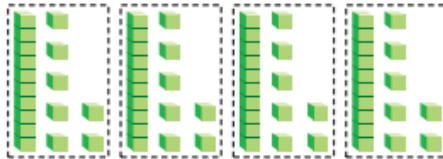


This drawing shows 6 tens, or 60, shared equally among 4 groups.

Our dividend is 68. We also need to share the 8 ones from our original number equally among the 4 groups. How many ones should be added to each group? [Pause.]

Great! I heard 2 ones in each group, because $8 \div 4 = 2$.

Draw 2 more ones in each of the four groups and circle each group. [Draw.]



What do you see in each group? [Pause.]

Good job! Each group has 1 ten and 7 ones, or 17.

Let's revisit the original division problem of $68 \div 4$. We used base ten blocks to split 68 into 4 equal groups and found that $68 \div 4 = 17$. [Write $68 \div 4 = 17$.]

Objective #2: Teacher will guide students through how to solve a division problem numerically using the distributive property.

Let's explore what this problem looks like using number sentences and the distributive property. You might remember the distributive property from multiplication. The distributive property says that you can break the dividend into two numbers and then divide each number by the divisor to get two quotients. Their sum is the same quotient as the quotient of the original problem.

Our division problem is $68 \div 4$. [Write $68 \div 4$.]

Using the base ten blocks, we used place value to break the dividend, 68, into tens and ones. The number 68 has 6 tens and 8 ones. We could write that as $60 + 8$. [Write $60 + 8$.]

Then, we modeled dividing each of these numbers by the divisor, 4. Using parenthesis, this can be written as:

[Write and say.] $(60 \div 4) + (8 \div 4)$

Objective #2:

Through following along with the think aloud, students will learn how to solve division problem numerically using the distributive property.

With the base ten blocks, we found that $60 \div 4 = 15$ and $8 \div 4 = 2$.

[Write 15 and 2 underneath so it reads:

$$\begin{array}{r} (60 \div 4) + (8 \div 4) \\ 15 + 2 \end{array}$$

Then add the two quotients together. What is $15 + 2$?

[Pause.]

That's right, 17! [Write 17 underneath $15 + 2$.]

So $68 \div 4 = 17$. [Write $68 \div 4 = 17$.]

For this strategy, we used place value to break 68 into tens and ones. We knew $60 \div 4 = 15$ from the base ten block drawing. This might not be a division fact that you just know. Could we break 68 into two different numbers that might be easier to divide by 4? [Pause.]

I'm hearing some great ideas! Let's try using the distributive property to divide $68 \div 4$ by breaking 68 into 48 and 20. I know that I can break 68 into 48 and 20 because $48 + 20 = 68$. There are many numbers that can add to 68, but I picked 48 and 20 because I know I can divide both of these numbers easily by 4.

Follow along with me as we write the problem numerically.

[Write $68 \div 4$]

The distributive property says that we can break the dividend into two numbers and then divide each number by the divisor. Using parenthesis, this can be written as:

[Write and say.]

$$(48 \div 4) + (20 \div 4)$$

Using known division facts, I know that $48 \div 4 = 12$ and $20 \div 4 = 5$.

[Write 12 and 5 underneath so it reads:

$$\begin{array}{r} (48 \div 4) + (20 \div 4) \\ 12 + 5 \end{array}$$

Then add the two quotients together. What is $12 + 5$?

[Pause.]

That's right, 17! [Write 17 underneath $12 + 5$.]

So $68 \div 4 = 17$. [Write $68 \div 4 = 17$.]

This is the same solution that we found using the base ten blocks and breaking apart 68 by tens and ones.

To make a division problem easier to solve, you can break apart the dividend into two numbers. It's helpful to pick two numbers that make basic facts you already know how to divide by the divisor.

<p>Objective #3: Teacher will guide students through how to solve a division problem numerically using the distributive property with a larger dividend.</p> <p>Let's try another problem with a larger dividend. $147 \div 7$ [Write $147 \div 7$.]</p> <p>What are some of your ideas for breaking apart 147? [Pause.]</p> <p>Awesome ideas! Looking at place value, I notice that there is a 7 in the ones place. Since $7 \div 7$ is a division fact that I know, I'm going to use that. $7 \div 7 = 1$.</p> <p>Now what is left when I take 7 out of 147? [Pause.]</p> <p>Right! 140. Is 140 easy to divide by 7? [Pause.]</p> <p>It is! 140 can be written as 14 tens and I know that $14 \text{ tens} \div 7 = 7 \text{ tens}$, or 70.</p> <p>So we can break 147 into 140 and 7 since $140 + 7 = 147$. Then we need to divide each of those numbers by the divisor.</p> <p>Follow along with me as we write and solve the problem numerically. [Write $147 \div 7$.]</p> <p>Using parenthesis, we can rewrite this as: [Write and say.]</p> <p>$(140 \div 7) + (7 \div 7)$</p> <p>Using what we know about place value and basic division facts, I know that $140 \div 7 = 20$ and $7 \div 7 = 1$. [Write 20 and 1 underneath so it reads:</p> <p>$\begin{array}{r} (140 \div 7) + (7 \div 7) \\ 20 \quad + \quad 1 \quad] \end{array}$</p> <p>Then add the two quotients together. [Pause.]</p> <p>That's right, 20 plus 1 is 21! [Write 21 underneath $20 + 1$.]</p> <p>So $147 \div 7 = 21$. [Write $147 \div 7 = 21$.]</p> <p>Tying the learning together:</p> <p>How can you use the distributive property to find quotients? [Pause, allow students a moment to think and answer.]</p> <p>I'm hearing some great explanations! To review, we can break apart the dividend into two smaller addends and each part can be divided by the divisor. We can then solve the two smaller division problems and add the quotients.</p> <p>Thank you for thinking through division using the distributive property with me. Now you will get to practice these strategies. So get your paper and pencil ready!</p>	<p>Objective #3:</p> <p>Through following along with the think aloud, students will learn how to solve division problem numerically using the distributive property with a larger dividend.</p> <p>Tying the learning together:</p> <p>Students will explain how the distributive property can be used to find quotients.</p>
<p>Guided Practice (8 mins)</p> <p>Work through this next problem with me as I think aloud. [I do]</p>	<p>Students work alongside the teacher as the teacher thinks aloud.</p>

Divide $78 \div 6$ [Write $78 \div 6$.]

We are going to use base ten block drawings to divide.

Let's draw the number 78 with base ten blocks. Draw 7 rods to represent 70, or 7 tens. Then draw 8 small dots or circles to represent 8 ones. [Draw.]

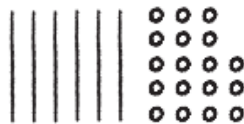


Let's think about how to break apart 78. Hmm. [Pause.]

I can take 6 of the ten rods and put 1 into each of the 6 groups. I still have another ten that is not in a group.

That means we need to take that ten rod and redraw it as 10 ones, so that we can split it up among the 6 groups.

We now have 6 tens and 18 ones to represent 78. Draw a quick picture to show this. [Pause, then draw.]



We are trying to share 78 equally among 6 groups. Draw circles to show the tens in 6 equal groups and the ones in 6 equal groups. [Pause, the draw.]



This drawing shows use of the distributive property. Let's write out our work numerically. [Write $78 \div 6$.]

We broke 78 into $60 + 18$. Each of these numbers need to be divided by 6. We can show this using parenthesis.

[Write and say.]

$$(60 \div 6) + (18 \div 6)$$

Then we saw in our picture that each group has 1 ten and 3 ones.

[Write 10 and 3 underneath so it reads:

$$\begin{array}{r} (60 \div 6) + (18 \div 6) \\ 10 + 3 \end{array}$$

And what is $10 + 3$? [Pause.]

You got it! 13! So $78 \div 6 = 13$ [Write $78 \div 6 = 13$.]

Look back at the drawing and notice how we split the number 78 into 6 groups. Each group has one ten and 3 ones, or 13, which is the solution to our division problem.

[illegible]

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4. $189 \div 9$ Answer: 21	
<p><u>Independent Practice</u> (1 min)</p> <p>Great work, everyone! Today, we practiced division with the distributive property. I hope you're seeing that the distributive property can help with division of larger numbers! You sure did a great job! After the video, you will have some problems to practice on your own. I will show you the independent practice problems now, or you can find them in the student practice for this lesson posted on our website, www.tn.gov/education. [Teacher shows student practice page under document camera or camera zooms in on student practice page.]</p> <p>Good luck and do your best!</p>	
<p><u>Closing</u> (1 min)</p> <ul style="list-style-type: none">• Boys and Girls, I enjoyed learning about division and the distributive property! Thank you for inviting me into your home. I look forward to seeing you in our next lesson in Tennessee's At Home Learning Series!• Bye!	

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