

Math: Grade 4, Lesson 17, Division

Lesson Focus: Divide Tens, Hundreds and Thousands

Practice Focus: Students will focus on practicing division in order to divide numbers through thousands by whole numbers to ten.

Objective: Students will use division to solve problems with a focus on dividing tens, hundreds, and thousands by whole numbers to ten.

Key Vocabulary: division, divisor, dividend, quotient

TN Standards: 4.NBT.B.6

Teacher Materials:

- Whiteboard and markers
- Student Activity 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 seventeenth 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 with tens, hundreds and thousands! 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 17 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, foreshadowing the work in the Teacher Model section.</p>

Dustin is putting apples into baskets. He wants to split the apples equally among 3 baskets. If Dustin has 24 apples, how many apples will be in each basket?

What is this problem about? [Pause.]

Great! It's about placing apples into baskets.

What information do we know? [Pause.]

That's right! We know that there are 3 baskets that will be packed equally with apples. We also know that there are 24 apples.

What are we trying to find out? [Pause.]

We are trying to find out how many apples will be in each basket.

What strategy might you use to solve this problem? [Pause.]

I am hearing that we need to use division! Good job! We know the total number of apples and we need to split the apples into equal groups because each basket holds the same amount of apples. How many baskets are there? [Pause.]

Right, there are 3 baskets.

So we need to divide $24 \div 3$. [Write $24 \div 3$.]

We can call these numbers the dividend and the divisor. The dividend is 24: the total amount of apples being split into equal groups. The divisor is 3, the number of groups, or in this case, baskets for the apples.

We are thinking about how many times 3 goes into 24. One way is to think about multiplication. Let's list some multiples of 3. Think about 3 times 1 is 3, 3 times 2 is 6, and so on to make a list. Give it a try! [Pause, then say and write the list of multiples below.]

3, 6, 9, 12, 15, 18, 21, 24

3 times what gave us 24? [Pause.]

That's right, 3 times 8. Remember that multiplication and division are related. We know that $3 \times 8 = 24$. This also means that $24 \div 3 = 8$.

This division sentence says that 3 goes into 24 eight times. 8 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 24 apples and split it equally into 3 baskets. Dustin can pack 8 apples into each basket.

For the next division problems, we are going to work with some larger numbers.

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.

Teacher Model (10 mins)


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

Let's think about the problem that we just solved. We split the number 24 into 3 equal groups. What if we wanted to split 240 into 3 equal groups? Since this is a larger number, it would take us a while to think through multiples so we're going to try a different strategy to divide $240 \div 3$.

[Write $240 \div 3$.]

For this strategy, we are going to use drawings of base ten blocks to represent numbers. Let's practice how to draw base ten blocks. Draw these 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.] 
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.

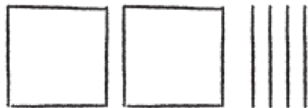
To represent 100, draw a square, also called a flat. [Draw.] 

The 100 flat is equal to 100 ones. How many tens are in 100?
[Pause.]

Right! So it's also equal to 10 tens.

Again, we're drawing a flat to make a quick picture.

Let's draw the number 240 with base ten blocks. Draw 2 flats to represent 200, or 2 hundreds. Draw 4 rods to represent 40, or 4 tens. We won't use any small dots for ones because there's a zero in the ones place of 240 [Draw]



We are trying to find $240 \div 3$, or split 240 into 3 equal groups. We can't divide 200 into 3 equal groups right now because we only have 2 flats in our base ten block drawing. We need to break apart the hundreds so we can see the tens that make them up. That way we'll be able to divide them into equal groups.

How many tens are in 100? [Pause.]

Great! There are 10 tens in 100.

What about 200? How many tens are in 200? [Pause.]

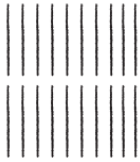
Students will listen to the teacher do a think aloud working a problem modeling the thought process for a problem from the start of the problem through finding the solution.

Objective #1:

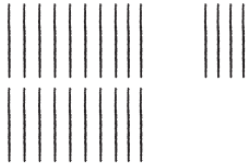
Through following along with the think aloud, students will learn how to solve a division problem by drawing base ten blocks.

That's right! There are 20 tens in 200.

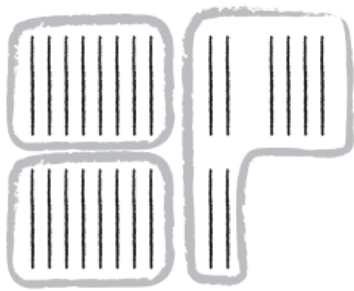
Redraw your 2 flats as 20 tens. [Draw.]



We also still have the 4 ten rods we drew earlier to represent 40, so our drawing of 240 now looks like this: [Draw.]



This drawing shows 240 renamed as 24 tens. Now we can use the base ten block drawing to separate the tens into 3 equal groups to model $240 \div 3$. How many do you think will be in each group? Hmm... Give it a try! Draw circles around the tens in the drawing to show the tens in 3 equal groups. [Draw.]



How many are in each group? [Pause.]

I heard 8 tens. Another way to write 8 tens is 80.

[Write and say.] $240 \div 3 = 80$.

Objective #2: Teacher will guide students through how to solve division problems using place value.

At the beginning of the lesson, we found that $24 \div 3 = 8$. With our base ten block drawings, we found that $240 \div 3 = 80$.

What do you notice? [Pause.]

Great job! I heard someone say place value. In both division problems, our divisor, or number of groups, 3, stayed the same. The dividend, the amount we were splitting into equal groups, changed. How did it change? [Pause.]

Objective #2:

Through following along with the think aloud, students will learn how to solve division problems using place value.

Right, 240 is 10 times larger than 24, because 24 times ten is 240. What happened to the quotient, or the result of the division problem? [Pause.]

That's right, 80 is also 10 times larger than 8, because 8 times 10 is 80.

Instead of drawing base ten blocks, we can also use place value and basic facts to divide. Let's look at the same problem, $240 \div 3$ and solve without drawing a picture.

[Write $240 \div 3$.]

We saw earlier with the base ten blocks that we can use place value to rewrite 240 as tens. [Say and write.]

$240 = 24$ tens

$240 \div 3$ can be rewritten as: [Write.] 24 tens $\div 3$

Since $24 \div 3$ is 8 [Write and say.] 24 tens $\div 3 = 8$ tens.

What's another way to write 8 tens? [Pause.]

You got it! 80!

Let's try it with an even larger number. [Write and say.]

$2,400 \div 3$

It would take a long time to draw these numbers, so we will use place value and basic facts to divide. Instead of tens, let's use hundreds to rewrite 2,400. How many hundreds are in 2,400? [Write and say.]

Great job, friends! $2,400 = 24$ hundreds.

$2,400 \div 3$ can be rewritten as: [Write.] 24 hundreds $\div 3$

Since $24 \div 3$ is 8 [Write and say.] 24 hundreds $\div 3 = 8$ hundreds.

What is another way to write 8 hundreds? [Pause.]

You got it! 800!

Tying the learning together:

Look back at the three division problems that we solved so far today: [Write and say.]

$24 \div 3 = 8$

$240 \div 3 = 80$

$2,400 \div 3 = 800$

What is the same about these division problems? [Pause.]

That's right! The non-zero digits all are the same basic fact of $24 \div 3 = 8$.

What's different about these division problems? [Pause.]

You got it! The number of zeros changes. This is because the place value of the divisor changed. In each problem, the place value of the divisor is ten times larger than the previous problem.

Tying the learning together:
Students will notice patterns related to place value that occur when dividing tens, hundreds and thousands by a whole number.

How did that change the quotient? [Pause.]

I'm hearing that the quotient is also ten times larger. Great job everybody! We can use place value and basic division facts to divide with larger numbers.

Thank you for thinking through division with tens, hundreds and thousands with me. Now you will get to practice these strategies. So get your paper and pencil ready!

Guided Practice (10 mins)

Work through this next problem with me as I think aloud.

[I do]

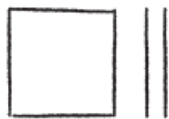
At an assembly, 120 students sit in 4 equal rows. How many students sit in each row?

What is the division problem we are trying to solve? [Pause.]

I hear you all saying [Write and say.] $120 \div 4$

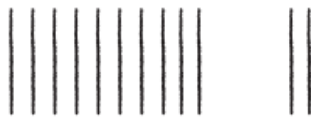
Let's try drawing base ten blocks to draw a picture of this problem. How would we represent 120 with base ten blocks?

[Pause, then draw.]



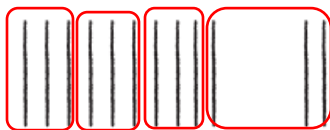
Can we split this drawing of 120 into 4 equal groups? [Pause.]

Not yet, since there is only one 100 flat, so let's redraw 100 as 10 tens. [Draw.]



This drawing shows 120 renamed as 12 tens. Now we can use the base ten block drawing to separate the tens into 4 equal groups to model $120 \div 4$. How many do you think will be in each group? Hmm... Give it a try! Draw circles around the tens in the drawing to show the tens in 4 equal groups.

[Draw.]



How many are in each group? [Pause.]

I heard 3 tens. Another way to write 3 tens is 30.

[Write and say.] $120 \div 4 = 30$.

Think back to the content of the problem. 120 students sitting in 4 equal rows means that 30 students will sit in each row.

Students work alongside the teacher as the teacher thinks aloud.

What if the division problem was $1,200 \div 4$? Let's think through this problem using place value and basic facts. Use hundreds to rewrite 1,200. [Pause.]
Great job, friends! $1,200 = 12$ hundreds.
 $1,200 \div 4$ can be rewritten as: [Write.] $12 \text{ hundreds} \div 4$
What is $12 \div 4$? [Pause.]
I heard 3! So [Write and say.] $12 \text{ hundreds} \div 3 = 3 \text{ hundreds}$.
What is another way to write 3 hundreds? [Pause.]
You got it! 300!

The dividend 1,200 is ten times more than the dividend 120 from the original question. What do you notice about the quotient? [Pause.]
I'm hearing that it's also ten times more! 300 is ten times more than 30. We can use place value and basic division facts to divide with larger numbers.

Now you try this one with me.

[We do]

A company produces 3,200 bottles of water each day. The company packs the water bottles into boxes with 8 bottles in each box. How many boxes are needed to hold all of the water bottles produced in one day?

What is the division problem we are trying to solve? [Pause.]
[Write and say.] $3,200 \div 8$

Since 3,200 is a large number to draw, let's think through this problem using place value and basic facts.

Use hundreds to rewrite 3,200. [Pause.]

Great job, friends! $3,200 = 32$ hundreds.

$3,200 \div 8$ can be rewritten as: [Write.] $32 \text{ hundreds} \div 8$

What is $32 \div 8$? [Pause.]

I heard 4! So [Write and say.] $32 \text{ hundreds} \div 8 = 4 \text{ hundreds}$.

What is another way to write 4 hundreds? [Pause.]

You got it! 400!

What does 400 mean in this problem? [Pause.]

Right, the company needs 400 boxes to hold all of the water bottles produced in one day.

What if the company only had 320 bottles of water? Think about how this dividend is related to 3,200 to help you solve $320 \div 8$. [Write $320 \div 8$, then pause and allow students time to think.]

320 is equal to 32 tens. [Write $320 = 32 \text{ tens}$.]

We'll use the basic fact $32 \div 8$.

[Say and write.] $32 \text{ tens} \div 8 =$

[Give students a moment to think.]

Students will respond to teacher questions with less scaffolding than the previous example. Students will have more time to think and respond on their own prior to the teacher providing solutions.

<p>Good job, everyone! $32 \text{ tens} \div 8 = 4 \text{ tens}$, or 40.</p> <p>The dividend 320 is ten times less than the dividend 3,200 from the original question. What do you notice about the quotient? [Pause.] I'm hearing that it's also ten times less! 40 is ten times less than 400. Place value can help us notice patterns in division.</p> <p>[You do]</p> <p>Go ahead and try this one on your own. I'll give you some time to think it through.</p> <p>Eileen and Carl collected 180 empty cans to recycle. They packed an equal number of cans into 3 boxes to take to the recycling center. How many cans were in each box?</p> <p>Remember that you can draw base ten blocks, or use place value and basic division facts to solve. [Allow time for students to think through and solve.]</p> <p>Did you write the division problem $180 \div 3$? [Pause.] 180 is equal to 18 tens, so $18 \text{ tens} \div 3 = 6 \text{ tens}$. Another way to write 6 tens is 60. There were 60 cans in each box.</p> <p>Great job, students!</p> <p><u>Additional Problems (if Needed):</u></p> <ol style="list-style-type: none"> 1. $280 \div 7$ Answer: 40 2. $2,800 \div 7$ Answer: 400 3. $360 \div 6$ Answer: 60 4. $3,600 \div 6$ Answer: 600 	<p>Students are working almost exclusively independently with the teacher providing answers at the end.</p>
<p><u>Independent Practice (1 min)</u></p> <p>Great work, everyone! Today, we practiced division with tens, hundreds and thousands. I hope you're seeing that place value can help with division or 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 (1 min)</u></p> <ul style="list-style-type: none"> • Boys and Girls, I enjoyed learning about division with tens, hundreds and thousands with you! Thank you 	

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<p>for inviting me into your home. I look forward to seeing you in our next lesson in Tennessee's At Home Learning Series!</p> <ul style="list-style-type: none">• Bye!	
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