PBS Lesson Series

Math: Grade, 2 Lesson 17, Adding 3-Digit Numbers

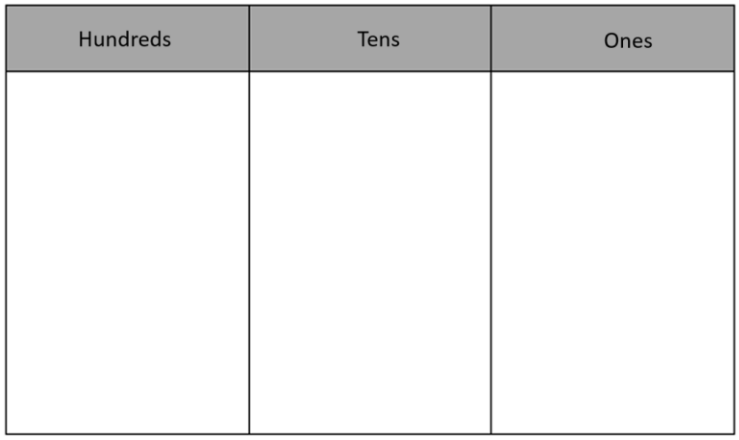
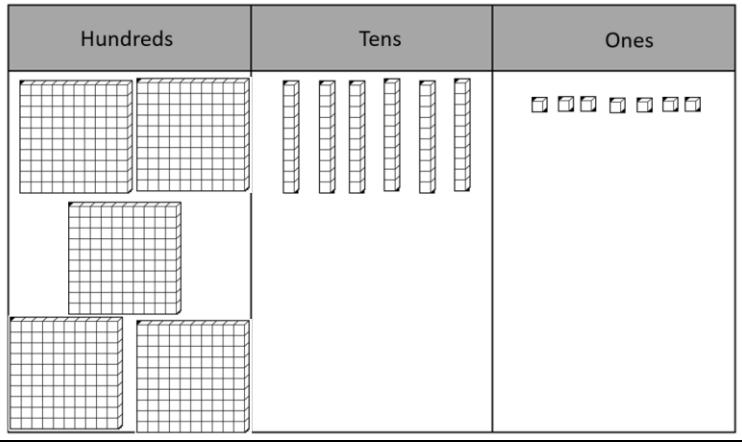
Lesson Focus: Adding 3-Digit Numbers
Practice Focus: Students will focus on expanding 3 digit numbers and combing like place values in order to add 3-digit numbers.
Objective: Students will use place value strategies to add 3-digit numbers with a focus on expanded form.
Key Vocabulary: expanded form, hundreds, tens, ones
TN Standards: 2.NBT.B.7
Teacher Materials:

- Place value mat and base ten blocks
- Marker, whiteboard, eraser
- Paper and marker
- Student Practice Packet

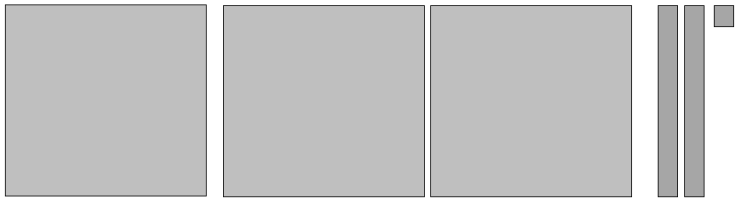
Student Materials:

- Paper
- Pencil

Teacher Do	Student Do
Opening (1 min) **Hello! Welcome to Tennessee's At Home Learning Series for math! Today's lesson is for all our 2nd graders out there, though all children are welcome to tune in. This lesson is the seventeenth in our series.** **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!** **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.** **Today we will be learning about adding 3-digit numbers in expanded form in mathematics! Before we get started, to participate fully in our lesson today, you will need:** ● **Paper** ● **Pencil** ● **The student packet for Math, Grade 2, Lesson 17 which can be found at www.tn.gov/education**	Students get materials ready for the lesson.

Ok, let's begin!	
Intro (5 minutes) **Welcome back, math friends! We have been working on adding 3-digit numbers using base ten blocks. Let's practice with our base ten blocks by building a number.** **Read this sentence with me.** **Farmer Ted grew 567 pumpkins last fall.** **On your sheet of paper, create a place value mat with me.** [Model.] **We will draw a large rectangle and divide it in 3 equal columns.** [Pause and compare.] **Hold yours up and let's compare our place value mats.**  **I am going to use my flats for 100s** [show], **rods for tens** [show]**, and blocks for ones** [show]**. Please quick sketch the number 567 on your mat and then we will compare models. I am going to build 567 with my base ten blocks and draw a model like yours.** [Pause, model, and then compare.]  	

Did you have 5 hundred flats? [Pause.] **Great job! Let's count them together to see how much they are worth. 100, 200, 300, 400, 500. We have 5 flats worth 500.** **Did you use 6 ten rods?** [Pause.] **Perfect! Let's count our rods to see how much they are worth. 10, 20, 30, 40, 50, 60. We have 6 rods worth 60.** **Did you use 7 ones?** [Pause.] **Right! We have 7 ones that are worth 7.** **We can write the values on our place value chart like this:** **500 + 60 + 7.** **We are going to use this form of the number, called expanded form, to help us add today.**	
<u>Teacher Model</u> (10 minutes) Objective 1: Model a 3-digit number using place value strategies. **Yesterday, we practiced modeling 3-digit numbers. Today, I am going to quick sketch the number 258. I am going to use a square for a 100s flat, a stick for a 10s rod, and a block for a 1.**  **I used** [write]: **2 hundreds, 5 tens, and 8 ones** Objective 2: Apply place value concepts when using a break apart strategy. **We can also write that number in expanded form:** **200 + 50 + 8** **Let's practice writing some numbers in expanded form. Think about the number 321. If we do a quick sketch, 321 would look like this:**	Objective 1: Quick draw numbers using base ten blocks. Objective 2: Use expanded form write 3-digit numbers.

 **We can break apart 321, or write it in expanded form like this:** [Show and point to where the numbers exist in the model.] **300 + 20 + 1** **Let's write 467 in expanded form. Think: how many flats, rods, and ones would you use?**	
How many hundreds? [Pause.] **Great! We would use 4 flats and 4 hundreds has a value of 400.** **How many tens?** [Pause.] **Correct! There are 6 tens, or 60.** **How many ones?** [Pause.] **Right again! We have 7 ones or 7.**	Students respond. Students respond. Students respond.
[Show:] **467** **_____ hundreds + _____ tens + _____ones** **_____ + _____ + _____**	
[Show:] **467** **4 hundreds + 6 tens + 7 ones** **400 + 60 + 7**	
[Tying it all together.] Objectives 3: Apply place value concepts when using a break apart strategy to add 3-digit numbers.	[Tying it all together] Objective 3: Use expanded form write and add 3-digit numbers.
Now we are going to use our expanded form to add 3-digit numbers.	
Consider this problem: **743** **+ 124**	
First, we are going to break apart each addend. It might help to think about what your sketch or model would look like.	
I am going to write [Write]**: 743 → 700 + 40 + 3** **124 → 100 + 20 + 4**	
Now we are going to add the hundreds, tens, and ones together, just like we did when we drew the models. It looks like this: [Show the expanded forms and addition.]	

743 → 700 + 40 + 3 **+ 124 → 100 + 20 + 4** **800 + 60 + 7 = 867**	
Let's look at another problem. Write this problem with me. [Write, then pause.] **538** **+ 211**	Students write the problem.
First, will break apart, or expand, the addends into hundreds, tens, and ones. Write both numbers in expanded form with me. [Write, then pause.] **538 → 500 + 30 + 8** **+ 211 → + 200 + 10 + 1**	Students write numbers in expanded form.
To find the total, we will add the hundreds, then add the tens, and then add the ones. [Write, then pause.] **538 → 500 + 30 + 8** **+ 211 → + 200 + 10 + 1** **700 + 40 + 9 = 749**	Students add the place values.
Guided Practice (15 minutes) [I Do] **Let's add in expanded form together!**	
Read the problem with me. [Read, then pause.] **Ben has 536 bottle caps. Lin gave him 253 more. How many bottle caps does Ben have now?**	Students read the problem.
How many bottle caps did Ben have at the beginning? [Pause and listen.] **True! Ben had 536 bottle caps.**	Students respond.
Then what happened in the text? [Pause and listen.] **Right! Lin gave him 253 bottle caps.**	Students respond.
How are we going to find Ben's total? [Pause and listen.] **Good idea! We are going to add the two numbers. On your sheet of paper, write this problem with me:** [Write and pause.]	Students respond. Students write the problem.

536 **+ 253**	
Now, we will break apart, or expand, the numbers. Do this with me beside the addends. [Write and pause.] **536 → 500 + 30 + 6** **+ 253 → 200 + 50 + 3**	Students expand the addends.
Do you remember how to find the total number of bottle caps? [Pause and listen.] **Yes! We are going to add the hundreds, the tens, and the ones. Let's do this together.** **536 → 500 + 30 + 6** **+ 253 → 200 + 50 + 3** **700 + 80 + 9 = 789** **We figured out that Ben now has 789 bottle caps. Great work!**	Students respond. Students finish the problem.
[We Do] **Ben collects bottle caps and Thea collects buttons.**	
Read this on your own and then we will read it together. [Pause, then read.]	Students read the problem.
Thea had 744 buttons. Her aunt gave Thea 152 more buttons. How many buttons does Thea have now?	
How do you think we will solve Thea's button problem? [Pause and listen.] **Good idea! To find Thea's total, we will need to add 744 and 152 together.**	Students respond.
Write the problem with me, making sure to line up the hundreds, tens, and ones. [Write and pause.] **744** **+ 152**	Students write the problem.
Let's compare problems. Does your work look like mine so far? [Pause and compare.]	Students compare.
We could draw a model, but with these larger numbers, it may be a little quicker to use expanded form to add. Break apart the numbers with me beside your problem. [Write and pause.] **744 → 700 + 40 + 4** **+ 152 → 100 + 50 + 2**	Students expand the addends.

Hold your work up for me to see! [Pause and look.] **Wonderful!!! Do you remember how we find the total number of buttons?** [Pause and listen.] **Good idea. We are going to add the hundreds, tens, and ones. Do this with me.** **744 → 700 + 40 + 4** **+ 152 → 100 + 50 + 2** **800 + 90 + 6 = 896** **Thea ended up with 896 buttons!**	Students compare. Students respond. Students add the place values.
[You Do] **Read this problem on your own.**	
Mrs. Jones has 845 sheets of yellow paper and 123 sheets of blue paper. How many sheets of paper does Mrs. Jones have?	Students read the problem.
Think: How will you solve the problem? [Pause.] **Good thinking! We will need to add the sheets of paper together to find out the total. We could draw a model, but the numbers are kind of big and would take a long time to sketch.**	Students respond.
Let's break apart, or expand the numbers, and then add. You set up your problem and then expand your numbers. I will do the same and then we will compare. [Pause, then show.] **845 → 800 + 40 + 5** **+ 123 → 100 + 20 + 3**	Students write the problem and expand.
Excellent work! Now you find the total and then we will compare answers. [Pause, then compare.] **845 → 800 + 40 + 5** **+ 123 → 100 + 20 + 3** **900 + 60 + 8 = 968**	Students compare.
Do you agree with 968 sheets of paper? [Pause and listen.] **Wonderful work! We are getting the hang of adding in expanded form!!**	Students answer the problem.

Additional Problems (if needed): **#1 Read this problem on your own.**	
There are 371 students in the second grade and 316 students in the first grade. How many students are there in the first and second grade?	Students read the problem.
Think: How will you solve the problem? [Pause.] **Good thinking! We will need to add the first grade and the second grade together to find out the total number of students. We could draw a model, but the numbers are kind of big and would take a long time to sketch.**	Students respond.
Let's break apart, or expand the numbers, and then add. You set up your problem and then expand your numbers. I will do the same and then we will compare. [Pause, then show.] **371 → 300 + 70 + 1** **+ 316 → 300 + 10 + 6**	Students write the problem and expand the addends.
Excellent work! Now you find the total and then we will compare answers. [Pause, then compare.] **371 300 + 70 + 1** **+ 316 → 300 + 10 + 6** **600 + 80 + 7 = 687** **There are 687 students in the first and second grade!**	Students compare. Students solve.
#2 Read this problem on your own.	
There are 374 highlighters in the pink bucket. There are 511 highlighters in the yellow bucket. How many highlighters are in the two buckets?	Students read the problem.
Think: How will you solve the problem? [Pause.] **Good thinking! We will need to add the highlighters in the two buckets together to find the total.**	Students respond.
Let's break apart, or expand the numbers, and then add. You set up your problem and then expand your numbers. I will do the same and then we will compare. [Pause, then show.] **374 → 300 + 70 + 4** **+ 511 → 500 + 10 + 1**	Students write and expand the addends.

Excellent work! Now you find the total and then we will compare answers. [Pause, then compare.] **374 → 300 + 70 + 4** **+ 511 → 500 + 10 + 1** **800 + 80 + 5 = 885** **There are 885 highlighters in the buckets!**	Students solve and compare.
Independent Practice (1 minute) **Great work, math friends! Today, we reviewed using expanded form to add 3-digit numbers. I hope you're seeing some connections to base ten blocks! 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.] **Good luck and do your best!**	
Closing (1 min) **Friends, I enjoyed reviewing adding in expanded form with you! 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!**	