PBS Lesson Series

Math: Grade, 2 Lesson 18, Adding 3-Digit Numbers

Lesson Focus: Adding 3-Digit Numbers
Practice Focus: Students will focus on adding 3-digit numbers using place value strategies.
Objective: Students will use place value strategies to add 3-digit numbers with a focus on base ten blocks and regrouping.
Key Vocabulary: addends, hundreds, tens, ones, regroup, trade-in, equation, expanded form
TN Standards: 2.NBT.B.7
Teacher Materials:

- Place Value Mat and Base Ten Blocks
- Marker, Whiteboard, Eraser
- Paper and Marker
- Student Practice Packet

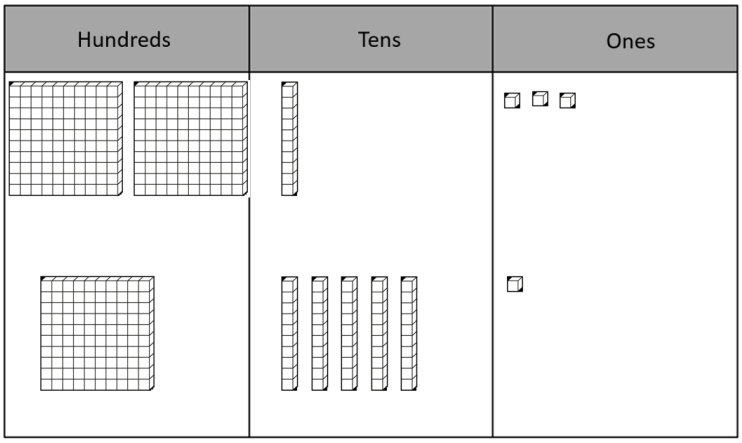
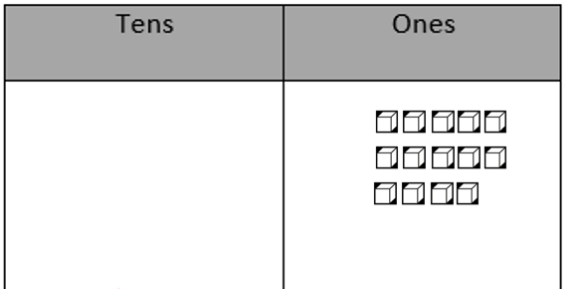
Student Materials:

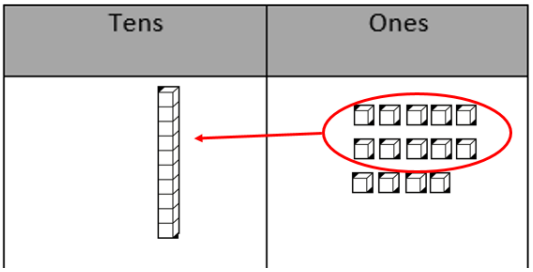
- Paper
- Pencil

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 eighteenth 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 with regrouping! Before we get started, to participate fully in our lesson today, you will need:** ● **Paper** ● **Pencil** ● **The student packet for Math, Grade 2, Lesson 18 which can be found at www.tn.gov/education** **Ok, let's begin!**	Students get materials ready for the lesson.

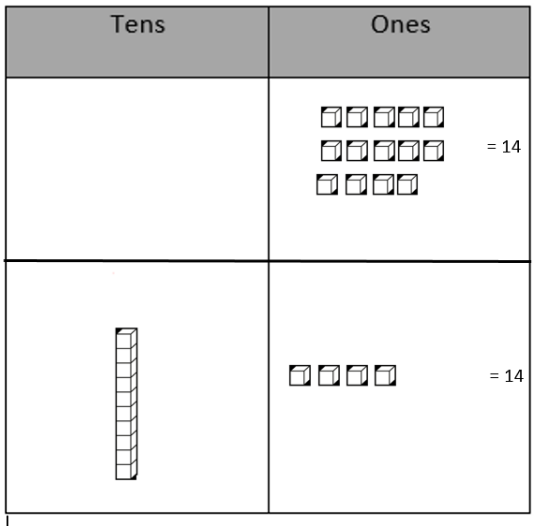
Intro (5 minutes) **We have been adding 3-digit numbers. I'm excited to continue our work!** **Before we begin, we will need to draw 5 place value mats, so grab your paper and pencil and follow along.** **First, we'll draw a large rectangle. This time, we will need to draw lines to divide the rectangle into 3 spaces. Watch me, then quick sketch yours.** [Model.] **We created 3 columns that we will label "Hundreds", "Tens", and "Ones". You are welcome to label yours with those words, or you could use an "H" for hundreds, a "T" for tens, and an "O" for ones.** [Pause, show your model.] **Please draw 3 more mats.** [Long pause.] **Great job listening! Now let's read this problem together.** **There were 213 people at the school play on Tuesday night and 151 people at the play on Thursday night. How many people saw the play on Tuesday and Thursday?** **Like before, we are going to use base ten models – a flat represents a 100** [Show], **a rod represents 10** [Show], **and a block represents 1** [Show] **How do you think we can use our base ten models to show this problem?** [Pause and listen.] **Right! We can build both numbers. Since we are trying to figure out the total, we will add the two numbers together. Would you build this problem on one of your mats now? I**	Students draw 5 place value mats.

Hundreds	Tens	Ones

will model the same problem with my blocks and draw a model like yours. Then we will compare. [Pause, model, and then compare.]  **What do you think? Do our models match?** [Pause.] **Excellent! Now find the total number of people who attended the school play and shout it out!** **Right! 364 people watched the play!** **Now we are ready to go!!!**	
<u>Teacher Model</u> (10 minutes) Objective 1: Model numbers less than 20 in 2 ways. **Earlier in our series, we thought about all of the different ways that we could model numbers. Consider this number.**  [Pause.] **What number do you see?** [Pause.] **Good counting! This is the number 14. We can count by 1s to figure out how many blocks we have. Do you see a ten in the number above?** [Pause.] **Yes! Remember that we can bundle those ten ones together to make 1 ten. 10 blocks is the same as 1 rod.** [Show rod and blocks side by side.]	Objective 1: Model numbers less than 20 in 2 ways. Students respond.



We can model 14 in two ways:



Objective 2: Use place value strategies to add 3-digit numbers with regrouping in the ones place. Connect to the concept of multiple representations of numbers.

Objective 2: Add 3-digit numbers with regrouping in the ones place.

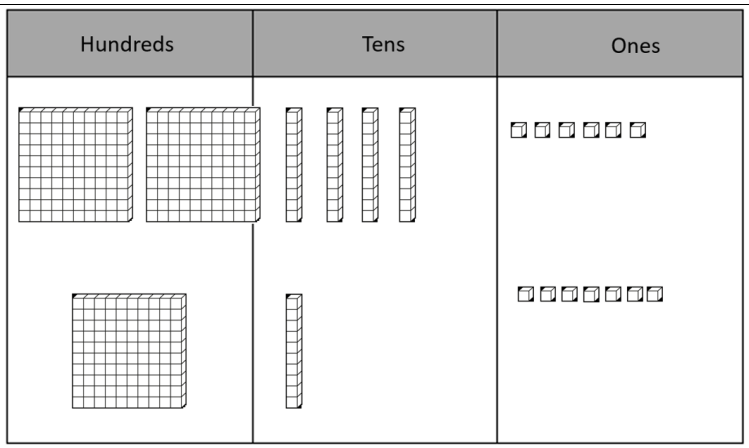
We are going to solve some problems that may have numbers in the ones place that can be bundled, or regrouped when we build our 3-digit models. Are you ready! I am excited to put two of our skills together!

Let's practice with 246
+ 117.

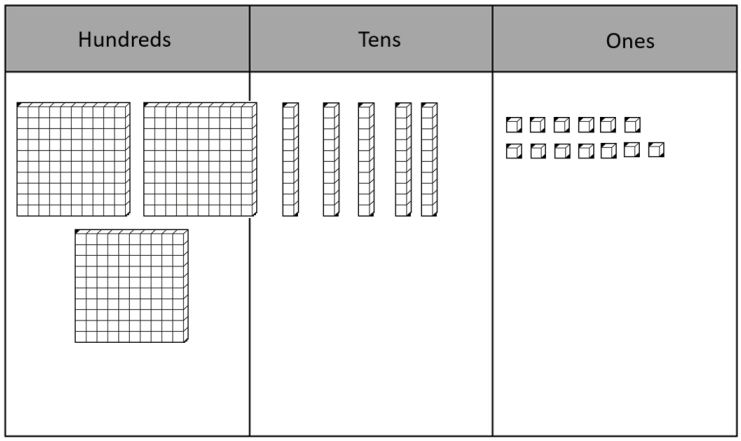
I am going to start by modeling both numbers. Think about how you would quick sketch these numbers while I am building the numbers with the base ten blocks and drawing a model.

Students think about the model.

[Sketch a picture in a place value mat.]



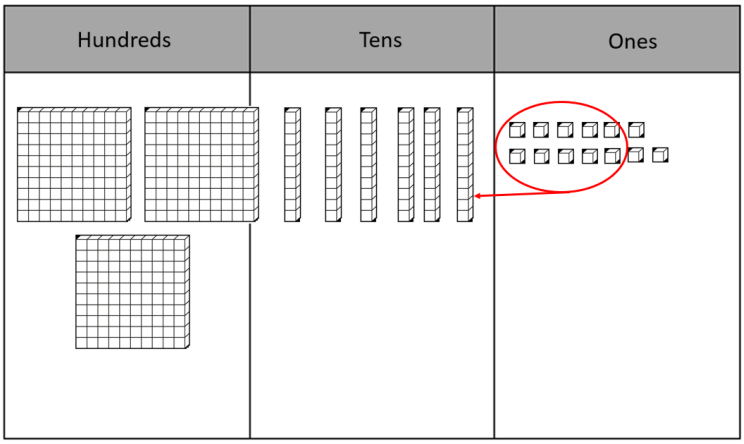
Our first number, 246, is made up of 2 hundreds, 4 tens, and 6 ones. The second number, 117, is made up of 1 hundred, 1 ten, and 7 ones. Look what happens when we combine the two numbers.

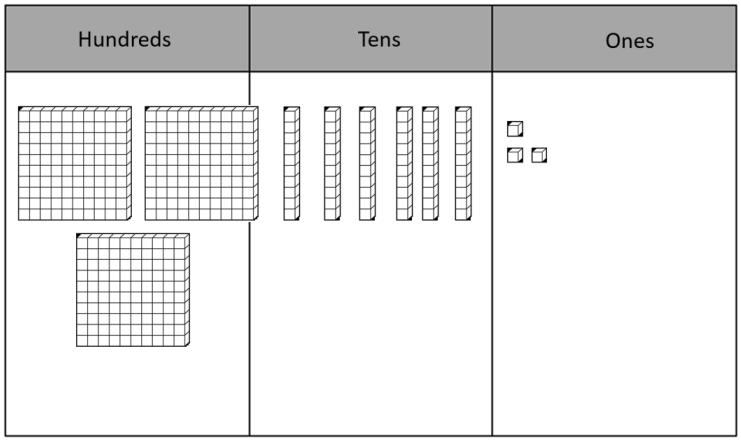


There are 3 hundreds, 5 tens, and 13 ones in the ones place.

300 + 50 + 13

We know that we can trade in 10 ones for a 10 rod.

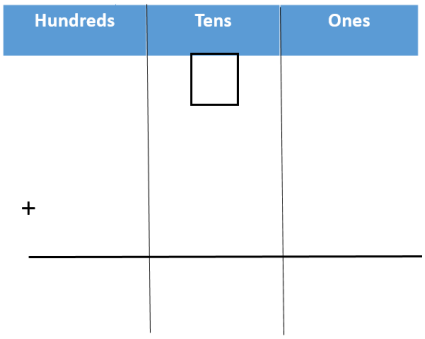




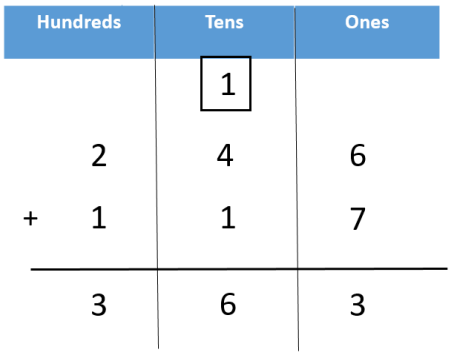
After our trade, or our regrouping, we still have 3 hundreds, but now we have 6 tens and 3 ones.

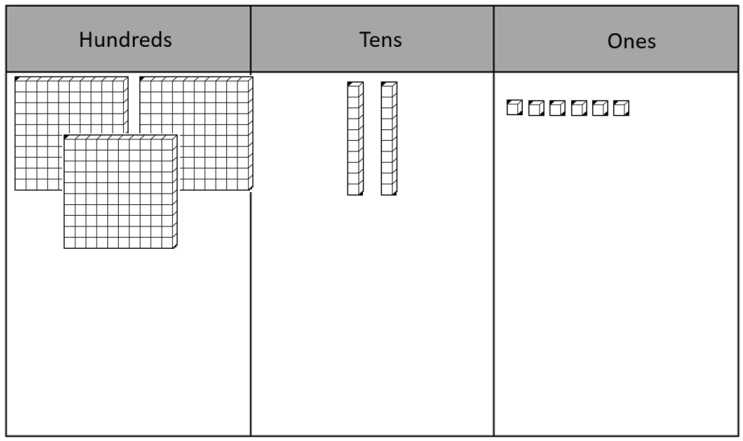
300 + 60 + 3

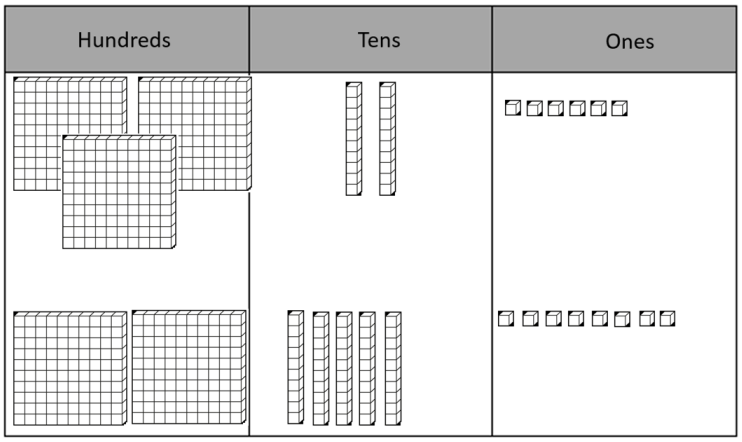
We can show the regrouping in our problem below: [Fill in a blank template with the numbers as you go.]



Notice that we still have hundreds, tens, and ones. When we combine the ones, 6 + 7, the answer is 13. In our model [Point] **we grouped 10 ones into a ten rod and moved it to the tens place. In this problem, we show the regrouping of 13 by moving 1 ten to the tens place, also.** [Point.]



What do you think? We used our model and a math problem to add 3-digit numbers and traded in, or regrouped, ten ones to make a ten rod.	
Guided Practice (13 minutes) [I Do] **Let's use our new skill to help Scout figure out how many pounds of hay he has for his horses! Read this problem with me.**	Students read the problem.
Scout has 326 pounds of hay for his horse. A neighbor brought 258 more pounds of hay to the farm. How much hay does Scout have now?	
How do you think we will find the total pounds of hay? [Pause.] **Good thinking! We will add the two amounts of hay. Please find a place value mat that you made earlier. We will model Scout's beginning amount of hay. Do this with me. How much hay did Scout have at first?** [Pause.] **Right… he had 326 pounds of hay.**	Students respond. Students respond.
	Students draw the model.
Let's compare. [Pause and compare.] **What should we do next?** [Pause.] **Good idea. We need to model the amount of hay that the neighbor brought. How much did the neighbor bring?** [Pause.] **Good reading! The text tells us that the neighbor brought 258 more pounds of hay.**	Students compare models. Students respond. Students respond.
You build that number on your mat while I add to mine. Then we will compare. [Pause then compare.]	Students build the next number and then compare.



We have the two amounts of hay modeled. How can figure out the total? [Pause.] **Yes! We will add them together. Let's count all of the hundreds, tens, and ones.**

Students respond.

How many hundreds are there? [Pause.] **Yes! We have 5 hundreds worth 500.**

Students respond.

How many tens area there? [Pause.] **True. We have 7 tens worth 70.**

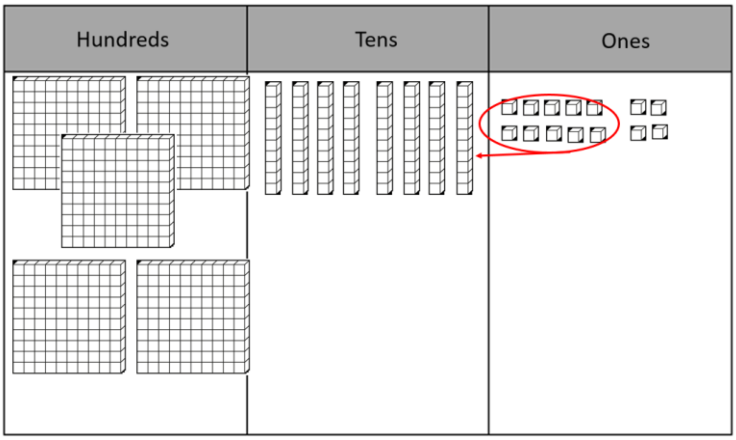
Students respond.

How many ones area there? [Pause.] **Good counting. We have 14 ones.**

Students respond.

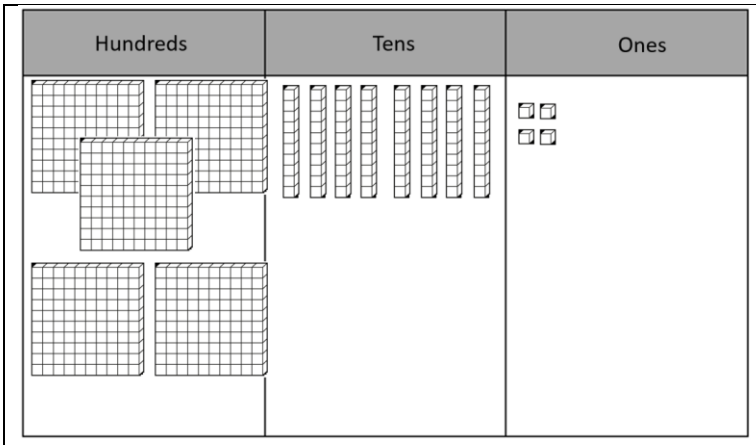
500 + 70 + 14

We will need to regroup or trade in 10 of the ones for a ten rod and move the ten over to the tens place [Point to the models below.]**. To show that we are trading, or regrouping, we will circle the ten ones, draw a line to the tens place, and then draw a ten. Do this with me.**



Students circle ones, draw a line to the tens, and then add a ten rod.

When writing numbers, we only have one digit for each place value, so we won't leave 14 in the ones place.



Now our model shows 5 hundreds, 8 tens, and 4 ones

500 + 80 + 4 = 584

Scout now has 584 pounds of hay for his horses.

Write a matching problem with me under your place value mat. [Pause and model.]

Students write the matching problem.

Hundreds	Tens	Ones
	1	
3	2	6
+ 2	5	8
5	8	4

Our problem matches our model. When we add 6 ones + 8 ones, we get 14 ones. In our model, we traded in 10 ones for 1 ten rod and moved it to the tens place, leaving 4 ones. We do the same thing here. 14 is made up of a ten and 4 ones. We move the ten to the tens place [Point] **just like our model. Please write 4 under the ones place and a 1 in the box in the tens place. Now, we add the tens together, just like our model. 1 ten plus 2 tens plus 5 tens gives us 8 tens.** [Point.] **Then we combine our hundreds. 3 hundreds plus 2 hundreds is 5 hundreds** [Point.] **Scout has 584 pounds of hay.**

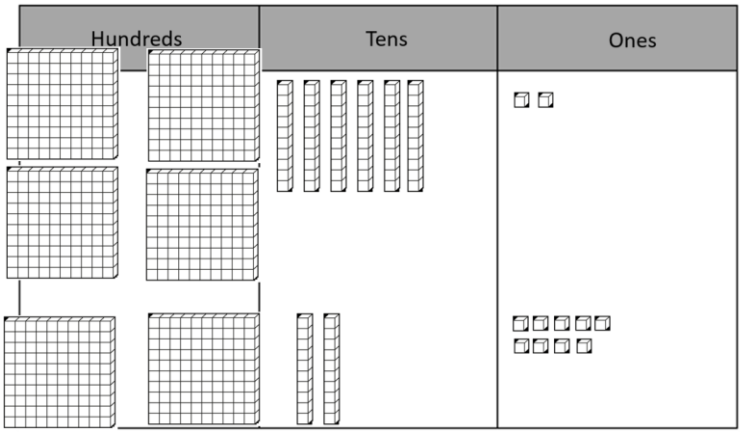
Students add with the teacher.

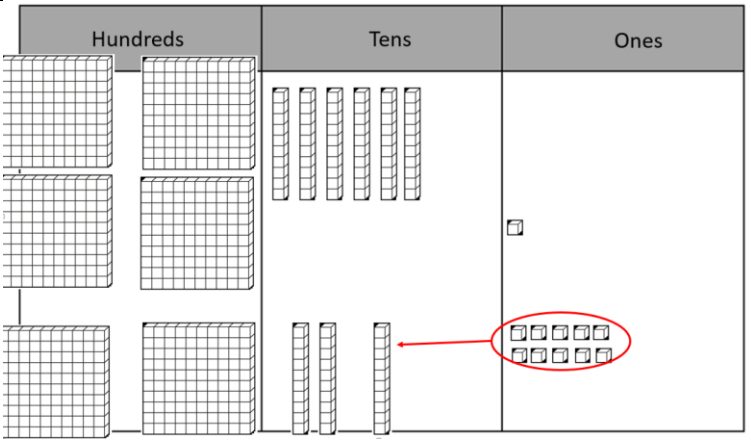
[We Do]

We did a great job of regrouping, or trading, with our 3-digit addition. Let's practice another problem.

Please read on your own.

Students read the problem.

On Saturday, 462 people visited the aquarium. On Sunday, 229 people came. How many people were at the aquarium over the weekend?	
What is happening in the problem? [Pause.] **Good reading! According to the text, people are visiting an aquarium on two days.**	Students respond.
How many came on Saturday? [Pause.] **Right! There were 462 people on Saturday.**	Students respond.
What happened on Sunday? [Pause.] **Right, again! 229 people went to the aquarium on Sunday.**	Students respond.
What are we trying to find? [Pause.] **Yes! We are trying to find the total.**	Students respond.
Would you please build the two numbers on one of the mats that you made? I will build my model at the same time and then we will compare. [Create model, pause, and then compare.]	Students create both numbers on their place value mats.
	
Let's compare our mats. [Pause and compare.] **Our model shows 600 + 80 + 11 = 691**	Students compare mats.
What do you notice about the ones place? [Pause.] **You are right. We can trade 10 ones in for a 10 rod. If you haven't already done that, do it with me now.**	Students respond. If students haven't already circled, drawn their arrow and added a ten rod, they do this now.



Our model shows 600 + 90 + 1 = 691

Please write the problem with me. [Pause, then compare.]

Hundreds	Tens	Ones
	□	
4	6	2
+ 2	2	9

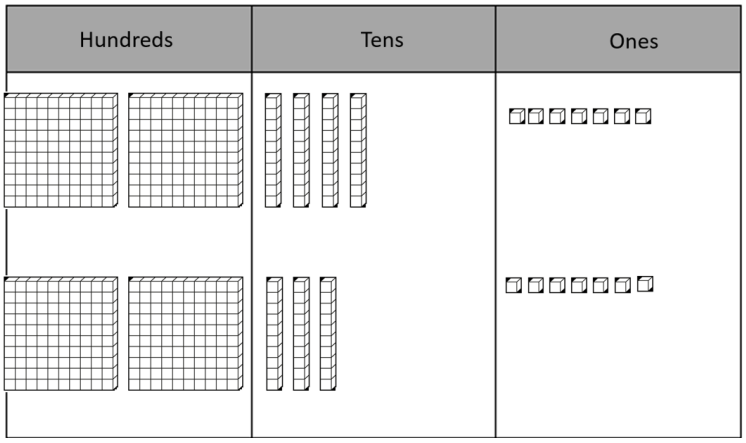
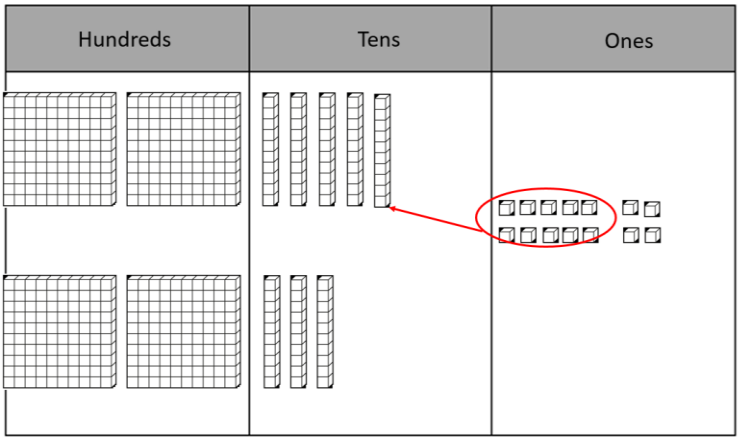
Students write their problem and then compare.

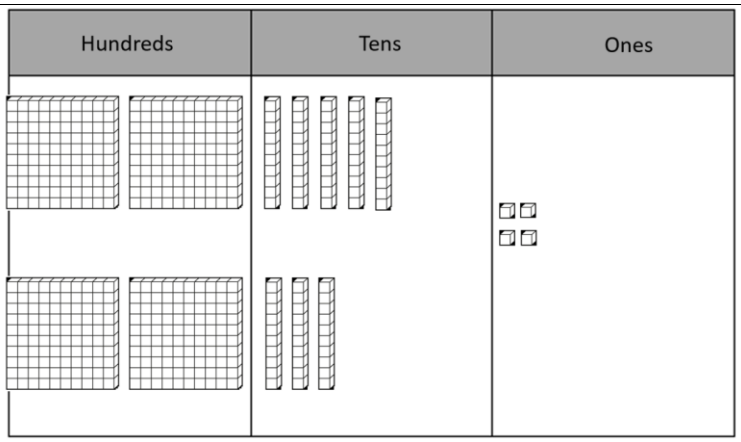
Please complete the problem on your own, checking to make sure it matches your model. We'll compare in a minute. [Pause and then compare.]

Hundreds	Tens	Ones
	1	
4	6	2
+ 2	2	9
6	9	1

Students complete their problem and then compare.

You are working so hard! Did you add 2 + 9 = 11? [Pause.] **Great! What did you do next?** [Pause.] **Good idea. You had to move one ten from the ones place because 11 = 10 + 1. You placed that ten in the tens place here.** [Point at the problem and at the model.] **Then we added 1 ten + 6 tens + 2 tens to get 9 tens.** [Point at the problem and at the model.] **We added 4 hundreds + 2 hundreds to get 6 hundreds.** [Point at the problem and at the model.] **691 people visited the aquarium over the weekend.**

[You Do] **Now let's try one on your own! Please read.** **Marten's math class used 247 jellybeans for a graph. Keith's math class used 237 jellybeans for their graphs. How many jellybeans did the two classes use?**	Students read the problem.
Please build the two numbers on a place value mat that you created earlier. Add the numbers together, trading or regrouping of you need. When you are finished, we will compare models. [Long pause, then compare models.]  **Our model shows 400 + 70 + 14 = 484**	Students build the two numbers on their place value mats and combine. They regroup if needed by drawing a circle and an arrow and then adding a ten rod.
Did you regroup the 14 ones? [Pause and listen.] **Good idea! We can take a 1 group of ten ones and trade them for a ten rod. Make sure that you have circled the group of 10 ones and drawn a line to the tens place.**  	Students respond. Students show regrouping if they haven't already.



Our model still shows 484.
400 + 80 + 4 = 484

Write the problem that matches the model on your own. Please solve the problem and regroup if necessary. We will compare in a bit. [Pause and then compare.]

Students write and solve the problem.

Hundreds	Tens	Ones
	1	
2	4	7
+ 2	3	7
4	8	4

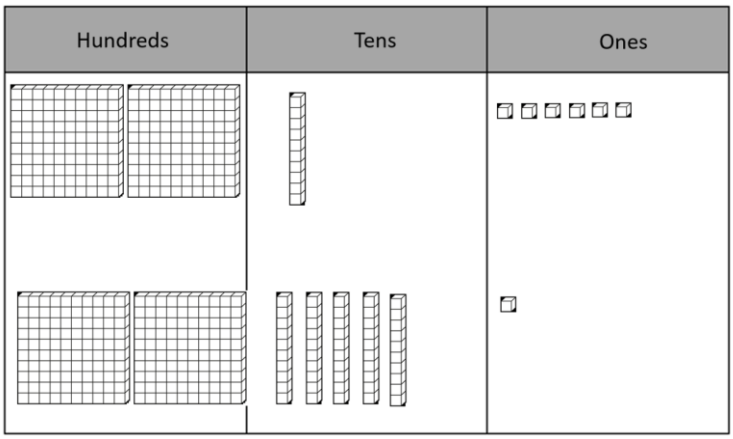
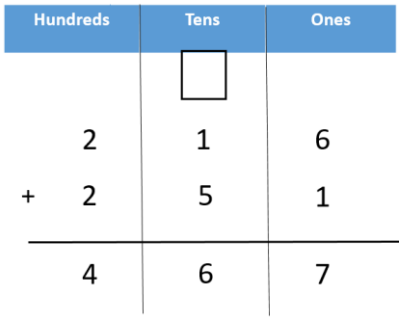
Students compare with teacher's problem.

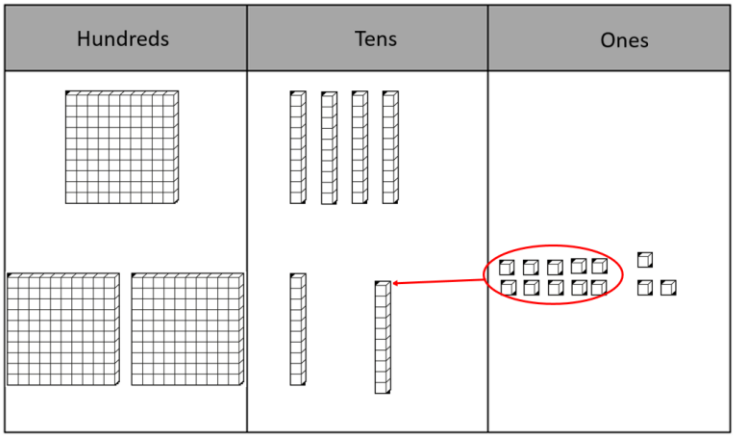
Do our problems match each other? [Pause.] **Yes? Great! Does your problem match your model, too?** [Pause.] **Good! When we added the ones place, 7 + 7 = 14. We moved the 1 ten in 14 to the tens place and wrote the 4 in the ones place. Then we added the tens together – 1 ten + 4 tens + 3 tens is 8 tens. Then we added 2 hundred + 2 hundred to get 4 hundred. The classes used a total of 484 jellybeans. Wonderful job!**

Students respond.
Students respond.

Additional Problems (if needed):
#1. Please read this on your own. [Pause.]
Claire and Brooklyn have been practicing volleyball for 3 months. Claire has hit 216 serves and Brooklyn has served 251 times. How many times have the girls served the ball so far?

Students read.

Using one of your place value mats, please set up and solve the problem. We will compare when you are finished. [Long pause, then compare.]	Students build models for numbers, combine, and regroup if necessary. IT IS NOT NECESSARY TO REGROUP HERE.
	
What do you think? Did you need to trade in any ones? [Pause.] **No! We have 7 ones. We do not have ten, so we don't need to trade or regroup.**	
Our model shows 400 + 60 + 7 = 467	
Write the problem and solve it on your own, then we will compare. [Pause then compare.]	Students write a problem then solve.
	
Did you need to regroup in the ones? [Pause.] **NO!! You are right. 6 + 1 = 7. There are no tens that need to be moved to the tens place. Good catch!!**	Students respond.
Together, Claire and Brooklyn have hit 467 serves!	
#2. Please read this on your own. [Pause.] **Lee is counting the steps across his yard and his neighbor's yard. It takes him 145 steps to cross his yard and 218 steps to cross his neighbor's yard. How many steps does it take to cross both yards?**	Students read.

Using one of your place value mats, please model the problem, regrouping if necessary.  **Let's compare. Do you have 300 + 60 + 3 = 363?** **Great job! At first, we had 13 ones, so we traded them in, or regrouped them, for a ten rod. Make sure that your model uses a circle and an arrow to show the trading or the regrouping.** **Now, write the problem that matches your model and then we will compare.** [Pause and then compare.] **Do we agree on the answer?** [Pause.] **It takes Lee 363 steps to get across the two yards. I noticed that you regrouped the ten in the ones place and moved it to the tens place. Excellent!**	Students build models, add, and regroup if necessary using a circle, arrow, and an additional ten rod. Students compare. Students write and solve the problem and then compare their work to the teacher's problem.
Independent Practice (1 minute) **Great work, math friends! Today, we added 3-digit numbers and regrouped with models. I hope you're seeing some connections to expanded form and writing numbers in multiple ways! 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	

Hundreds	Tens	Ones
	1	
1	4	5
+ 2	1	8
3	6	3

student practice page under document camera or camera zooms in on student practice page.] **Work hard and do your best!**	
Closing (1 min) **Boys and Girls, I enjoyed adding 3-digit numbers 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!**	