

Math: Grade 2, Lesson 11, Addition, Subtraction, and Length

Lesson Focus: Add and subtract with measurements.

Practice Focus: Students will focus on practicing addition and subtraction in order to find length measurements.

Objective: Students will use addition and subtraction to find total lengths and differences between lengths with a focus on using the correct operation.

Key Vocabulary: Addition, Subtraction, Length, Measurement, Difference, Rectangle, Opposite Sides

TN Standards: 2.MD.B.6

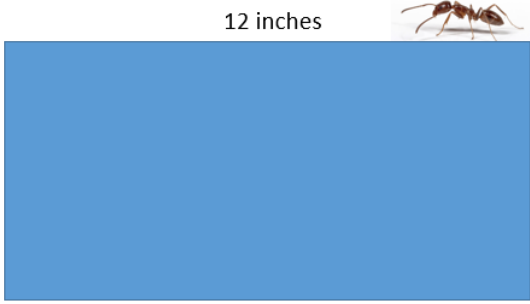
Teacher Materials:

- Whiteboard
- Dry Erase Markers and Eraser
- Models
- Student Practice Packet

Student Materials:

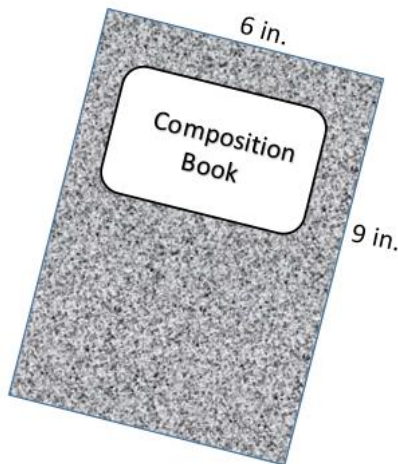
- Paper
- Pencil
- Surface to write on
- **Student Packet for Math, Grade 2 Lesson 11**
which can be found at www.tn.gov/education

Teacher Do	Student Do
<p>Opening (1 min)</p> <p>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 eleventh 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 adding and subtracting to find measurements in mathematics! Before we get started, to participate fully in our lesson today, you will need:</p> <ul style="list-style-type: none">• Something to write with• A piece of paper• The student packet for Math, Grade 2, Lesson 1 which can be found at www.tn.gov/education	<p>Students get materials ready for the lesson.</p>

<p>Ok, let's begin!</p>	
<p><u>Intro</u> (4 minutes)</p> <p>I noticed that there is an ant crawling around the edge of this blue rectangle. Over the last couple of weeks, we have been working on combining and taking apart totals. Do you think that you could use those skills to figure out the distance the ant has crawled around the entire shape? Let's look at the model and think together?</p> <div data-bbox="207 596 948 926">  </div> <p>Please draw the rectangle on your paper and label all of the sides. [Pause.]</p> <p>How could we figure out the distance the ant crawled? [Pause.]</p> <p>Great thinking! I heard you say that we could add up all of the sides of the rectangle. Please write that equation under the rectangle that you have drawn and then solve it. I will do the same on my paper. [Solve and share model.]</p> <p>How far did the ant travel? [Pause.]</p> <p>Excellent work! The ant traveled a total of 62 inches. We can find the distance by writing the equation</p> $62 = 12 + 9 + 12 + 9$ <p>62 is the total number of inches. Our shape is a rectangle, so we know that the opposite sides are the same. We have two 12s in our equation because we have opposite sides [point] that are 12 inches long. You wrote two 9s in your equation because we have these two sides which are opposite to each other [point] that are both 9 inches.</p>	<p>Students draw the rectangle and label.</p> <p>We could add up all of the sides!</p> <p>Students write the equation.</p> <p>Students answer the question.</p>
<p><u>Teacher Model</u> (10 minutes)</p>	

Objective 1: Students apply what they have learned about adding and subtracting 1- and 2- digit numbers as they solve problems about measurement. They find the distance around shapes.

We can use what we know about addition to find the distance around shapes. Let's figure out the distance around the front cover of this book! Please draw and label this with me.



The book is 9 inches long and 6 inches wide. The distance around the whole book is 30 inches. Think: Will I add or subtract? How do you know? [Pause.]

Let's write the equation underneath your model together:

$$9 + 6 + 9 + 6 = 30. \text{ [Pause.]}$$

$$9 + 6 + 9 + 6 = 30$$

$$\begin{array}{c} \text{9} \quad \text{6} \quad \text{9} \quad \text{6} \\ \text{18} \quad \text{12} \quad \text{30} \end{array}$$

The drawing only has one 9 and one 6 labeled. Where are the second set of numbers in the model? [Pause.]

Good thinking! There are two sides that are 9 inches each and there are 2 sides that are 6 inches because this shape is a rectangle. When we add $9 + 9 = 18$, we have a doubles fact! We also add $6 + 6 = 12$, which is another doubles fact!!

Objective #1:

Students will be using addition to find the distance around shapes. This allows students to connect addition on a number line to addition with measurement.

Students draw and label.

Students say: I will add all of the sides up because I want to know the distance around the all 4 sides.

Students write their equation.

Students respond: We have $9 + 6$ twice because there are two sides.

We added together all 4 sides to find the distance, or perimeter, around the outside.

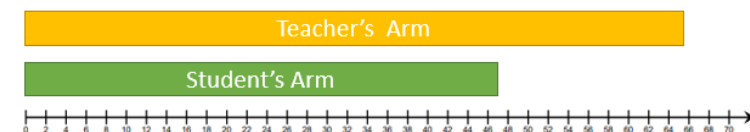
Objective 2: Students apply what they have learned about adding and subtracting 1- and 2- digit numbers as they solve problems about measurement. They subtract to compare lengths.

We are going to look at some more problems that have to do with length. Consider this table.

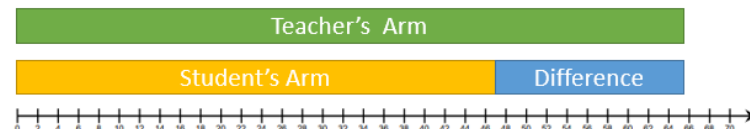
Arm Length in Centimeters	
Teacher	66
Student	47

How much longer is the teacher's arm than the student's arm? Think: Will I add or subtract? [Pause and listen.]

If you said that we should subtract, give your brain a kiss! This is a subtraction problem because we are trying to figure out the difference between the two arm lengths – how many centimeters longer the teacher's arm is than the student's arm. I am going to draw a number that is counting by 2s and add the models.



I can use the model to find the difference between the two lengths.



Write the subtraction problem with me. $66 - 47 = 19$. I am going to subtract 47 from 66.

Objective #2

Students will be using subtraction to find the difference between lengths. This allows students to connect subtraction on a number line to subtraction with measurement.

Students respond: I am going to subtract to find the difference.

Students write the subtraction problem: $66 - 47 = 19$

<div data-bbox="466 193 563 283" data-label="Equation-Block"> $\begin{array}{r} 66 \\ - 47 \\ \hline \end{array}$ </div> <div data-bbox="196 331 867 367" data-label="Text"> <p>Write the problem down and work it with me. [Pause.]</p> </div> <div data-bbox="196 438 935 615" data-label="Text"> <p>We start in the ones place. Since we cannot subtract 7 ones from 6 ones, we will trade in 1 ten for ten ones and add those ten ones to the 6 ones that are already in the ones place. We now have 16 ones. We can subtract 7 ones from 16 ones. We have 5 tens remaining and can subtract 4 tens.</p> </div> <div data-bbox="477 630 583 823" data-label="Equation-Block"> $\begin{array}{r} \begin{array}{cc} 5 & 16 \\ \text{tens} & \text{ones} \end{array} \\ \begin{array}{r} \cancel{66} \\ - 47 \\ \hline 19 \end{array} \end{array}$ </div> <div data-bbox="196 869 953 938" data-label="Text"> <p>The teacher's arm is 19 centimeters longer than the student's arm.</p> </div> <div data-bbox="196 978 954 1119" data-label="Text"> <p>Sometimes we add to solve our measurement problems and sometimes need to subtract! Let's work some more problems together to keep practicing. By the time we finish, I bet you will be able to work these all by yourself!</p> </div>	<div data-bbox="969 300 1424 369" data-label="Text"> <p>Students work out the problem with the teacher.</p> </div>
<div data-bbox="196 1157 552 1192" data-label="Text"> <p><u>Guided Practice</u> (10 minutes)</p> </div> <div data-bbox="203 1230 264 1264" data-label="Text"> <p><u>I Do</u></p> </div> <div data-bbox="196 1297 935 1440" data-label="Text"> <p>Let's do some practice problems together! Julian collects baseball cards. How can we find the distance around the outside of this card? Draw and label this card on your paper. [Pause.]</p> </div> <div data-bbox="373 1465 761 1799" data-label="Image"> </div> <div data-bbox="196 1833 763 1869" data-label="Text"> <p>How many sides does the card have? [Pause.]</p> </div>	<div data-bbox="969 1335 1278 1367" data-label="Text"> <p>Students draw and label.</p> </div> <div data-bbox="969 1866 1198 1900" data-label="Text"> <p>Students respond.</p> </div>

Way to be looking! The card has 4 sides.

How long is the card? [Pause.]

Excellent! The card is 10 cm long.

How wide is the card? [Pause.]

Right, again! The card is 7 cm wide. Think: Will I add or subtract? [Pause and listen.]

Good thinking! We must add to find the number of centimeters around ALL of the sides.

Let's write and solve the equation to find the distance around the card together. $10 + 7 + 10 + 7 = 34$

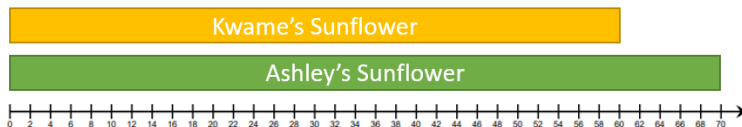
$$\begin{array}{r}
 10 + 7 + 10 + 7 = 34 \\
 \text{ } \quad \diagdown \quad \diagup \quad \diagdown \quad \diagup \\
 20 + 14 = 34
 \end{array}$$

Notice that our baseball is a rectangle. Remember that a rectangle has 2 pairs of sides that are the same! $10 + 10 = 20$... that's a doubles fact! We also have $7 + 7 = 14$. That's another doubles fact!!

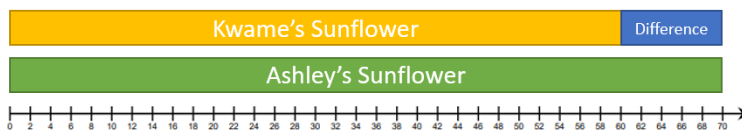
The baseball card is 34 centimeters around the outside. It has a perimeter of 34 centimeters.

Ashley's sunflower is 70 inches tall. Kwame's sunflower is 60 inches tall. How much taller is Ashley's sunflower than Kwame's sunflower? Draw a model of the problem on your own while I draw my model and then we will compare. [Model and compare.]

Think: Will I add or subtract? [Pause and listen.]



Now solve, either with the model or with the standard algorithm.



70

Students respond.

Students respond.

Students respond.

Students write and solve the equation.

Draw a model and compare the teacher's model.

I am going to have to subtract because I want to figure out the difference between the two flowers.

Students solve the problem.

$$\begin{array}{r} - 60 \\ 10 \end{array}$$

How much longer is Ashley's sunflower? [Pause and listen.]
Both the model and the standard algorithm tell us that Ashley's sunflower is 10 inches longer than Kwame's sunflower.

We Do

Let's try another problem!

What is the distance around this puzzle?



Please draw and label the model. I will do the same and then we will compare. [Pause and then hold up model to compare.]
Think: Will I add or subtract? [Pause and listen.]

Yes! We must add to find the total distance around the outside.

Wow! Your models look great! Now, write and solve the equation that will find the distance around the outside. I will do the same and then we will compare. [Pause.]

$$\begin{array}{l} 15 + 12 + 15 + 12 = 54 \\ 30 + 24 = 54 \end{array}$$

Notice that we have 2 sets of doubles here! Our rectangles have 2 pairs of sides that are the same length! $15 + 15 = 30$... that's a double fact! And we have $12 + 12 = 24$. That's a doubles fact, also!!!

How many centimeters are on the sides of the puzzle? [Pause and compare.]

I see that you said 54 centimeters. That is great!

We are on a roll! Try this!

A volleyball measures 8 inches across. A baseball is 3 inches across. How much longer is a volleyball across? Draw a

Students report that Ashley's sunflower is 10 inches taller.

Students draw and label the model. Then they compare with teacher's model.

I am going to have to add because I am looking for a total.

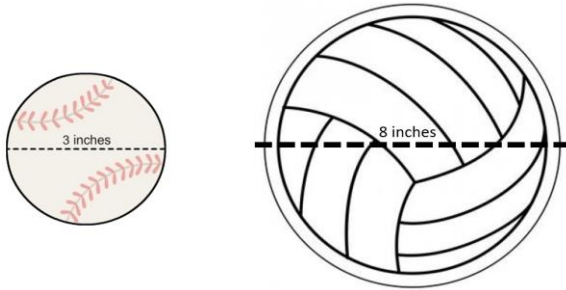
Students write and solve the equation.

The puzzle is 54 inches around the outside.

Draw a model.

model and then think: Will I add or subtract? [Pause and listen.]

Good thinking! This is a subtraction problem because we are trying to find the difference between the two balls.



Write the equation and find how much bigger the volleyball is than the baseball.

[Pause.]

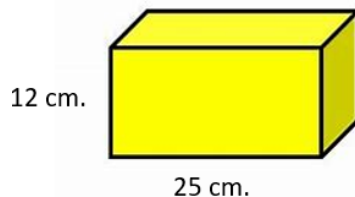
$$8 - 3 = 5$$

The volleyball is 5 more inches across than the baseball.

Additional Problems (if Needed):

Add in 2 or 3 optional, additional problems for the teacher if they need to fill remaining time.

#1. What is the distance around the front of the box of tissues?



Please draw and label the model. I will do the same and then we will compare. [Pause and then hold up model to compare.]

Think: Will I add or subtract? [Pause and listen.]

Yes. We must add here to find the distance around the outside of the front of the tissue box.

Wow! Your models look great! Now, write and solve the equation that will find the distance around the outside. I will do the same and then we will compare. [Pause.]

Students say that they need to subtract.

Students say that the volleyball is 5 more inches across than the baseball.

Draw a model and compare the teacher's model.

We are going to add because we are finding the total of the sides.

Students write the equation and solve the problem.

<div data-bbox="391 195 790 237" data-label="Equation-Block"> $25 + 12 + 25 + 12 = 74$ </div> <div data-bbox="420 300 657 340" data-label="Equation-Block"> $50 + 24 = 74$ </div> <div data-bbox="198 352 909 422" data-label="Text"> <p>How many centimeters are on the sides of the tissue box? [Pause and compare.]</p> </div> <div data-bbox="198 462 899 529" data-label="Text"> <p>I see that you said 74 centimeters. You are working very hard!</p> </div> <div data-bbox="198 567 238 598" data-label="Text"> <p>#2</p> </div> <div data-bbox="198 600 758 636" data-label="Text"> <p>How much shorter is the pen than the pencil?</p> </div> <div data-bbox="279 684 678 844" data-label="Figure"> <p>The diagram shows two horizontal bars. The top bar is orange and labeled '17 cm' above it and 'Pen' inside it. The bottom bar is grey and labeled '13 cm' above it and 'Pencil' inside it.</p> </div> <div data-bbox="198 867 732 903" data-label="Text"> <p>Draw a model of the problem on your own.</p> </div> <div data-bbox="198 903 794 936" data-label="Text"> <p>Think: Will I add or subtract? [Pause and listen.]</p> </div> <div data-bbox="198 936 914 1008" data-label="Text"> <p>Yes! This is subtraction problem. How much longer is the pen? [Pause and listen.]</p> </div> <div data-bbox="198 1050 943 1115" data-label="Text"> <p>Great work! We wrote the equation $17 - 13 = 4$. That the pen is 4 centimeters longer than the pencil.</p> </div>	<div data-bbox="969 1012 1278 1043" data-label="Text"> <p>Students draw and label.</p> </div> <div data-bbox="969 1083 1398 1117" data-label="Text"> <p>Students respond, I must subtract.</p> </div> <div data-bbox="969 1155 1325 1224" data-label="Text"> <p>Students write and solve the equation.</p> </div>
<div data-bbox="198 1509 552 1543" data-label="Text"> <p><u>Independent Practice</u> (2 min)</p> </div> <div data-bbox="198 1581 932 1829" data-label="Text"> <p>Great work, friends! Today, we used addition and subtraction to solve problems dealing with length. I hope you're seeing some connections to the number line and our problem solving strategies from last week! You sure did a great job! After the video, you will have some problems to practice on your own. You can find the student practice for this lesson posted on our website, www.tn.gov/education.</p> </div> <div data-bbox="198 1829 862 1898" data-label="Text"> <p>[Teacher shows student practice page under document camera or camera zooms in on student practice page.]</p> </div>	

PBS Lesson Series

Have fun and do your best!	
<u>Closing</u> (1 min) Friends, I enjoyed reviewing adding and subtracting with lengths 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!	

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