

Math: Grade 2, Lesson 12, Addition, Subtraction, and Length

Lesson Focus: Pictures and equations can be used to solve word problems involving measurements. Measurements can be added and subtracted in the same way as other whole numbers.

Practice Focus: Students will focus on practicing addition and subtraction in order to solve problems involving measurement. Adding or subtracting to solve problems with unknown measures connects to solving problems with unknowns in all positions.

Objective: Students will use drawings and equations to solve word problems with a focus measurement.

Key Vocabulary: addition, subtraction, addend, sum, total, difference

TN Standards: 2.MD.B.5

Teacher Materials:

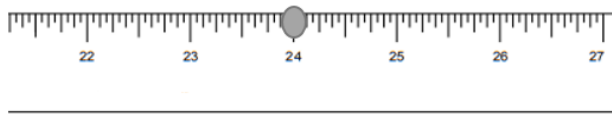
- Whiteboard,
- Dry Erase Markers and Eraser
- Student Practice Packet

Student Materials:

- Paper
- Pencil
- A Surface to write on
- Student Practice Packet

Teacher Do	Student Do
<p><u>Opening (1 min)</u></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 twelfth 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 solving measurement problems with adding and subtracting in mathematics! Before we get started, to participate fully in our lesson today, you will need:</p> <ul style="list-style-type: none">• Paper• Pencil• A Surface to write on	

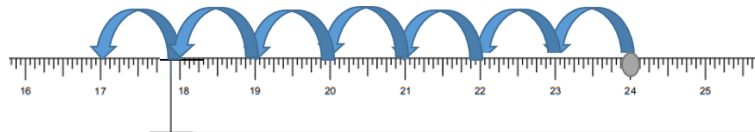
<ul style="list-style-type: none"> The student packet for Math, Grade 2, Lesson 12 which can be found at www.tn.gov/education <p>Ok, let's begin!</p>	
<p><u>Intro</u> (4 minutes)</p> <p>Yesterday, we used addition and subtraction to solve problems with lengths. How would you figure out the plant question below?</p> <p>[Pause]</p> <p>Renee compares the length of a leaf and a plant. The leaf is 15 centimeters. The plant is 37 centimeters. How much shorter is the leaf than the plant? [Pause]</p> <div data-bbox="357 709 722 888" data-label="Image"> </div> <p>Think: Do I need to add or subtract? [Pause.]</p> <p>Let's write and solve an equation together to figure out how much shorter the leaf is.</p> <div data-bbox="324 1018 868 1134" data-label="Equation-Block"> <p>I wrote $\begin{array}{r} 37 \\ - 15 \\ \hline \end{array}$ and then solved it $\begin{array}{r} 37 \\ - 15 \\ \hline 22 \end{array}.$</p> </div> <p>Hold up your work and we will compare. [Pause and compare.]</p> <p>The leaf is 22 centimeters shorter than the plant.</p>	<p>Students respond: We need to subtract.</p> <p>Students write the equation.</p> <p>The students hold up and compare their work.</p>
<p><u>Teacher Model</u> (10 minutes)</p> <p>Objective 1: Students will focus on practicing subtraction in order to solve problems involving measurement. Subtracting to solve problems with unknown measures connects to solving problems with unknowns in all positions.</p> <p>We solved the last problem with a model and an equation. Now, we are going to practice solving measurement problems with a ruler and a number line. I can't wait to get started!</p> <p>Michelle jumped 24 inches. Tim jumped 7 fewer inches than Michelle. How far did Tim jump? I am going to use a yard stick to draw a model.</p>	<p>Objective 1: Students subtract using a number line and ruler to find missing lengths.</p>



Think: Do I need to add or subtract? [Pause.]

Is the number getting bigger? Did Tim jump further than Michelle? Do we go towards the right? [Pause and listen.]
Good catch!

Tim jumped 7 FEWER inches than Michelle, so we will be moving to the left on the ruler. We will start at 24 inches because that is how far Michelle jumped. Count 7 fewer inches with me: 1, 2, 3, 4, 5, 6, 7. Seven fewer inches than 24 is 17 inches. Tim's jump was 17 inches long.



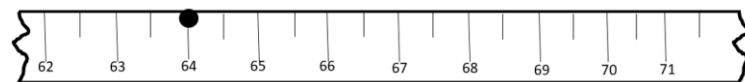
I can write the equation $24 - 7 = 17$ to match our model.

Objective 2: Students will focus on practicing addition in order to solve problems involving measurement. Adding to solve problems with unknown measures connects to solving problems with unknowns in all positions.

We used a ruler to help us solve measurement problem. Let's see if we can do it again!

Stuart's desk is 64 centimeters long. His dresser is 7 centimeters longer than his desk. How long is Stuart's dresser?

I am going to use a meter stick to draw a model.

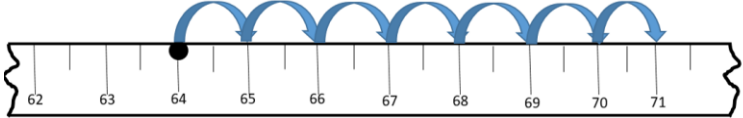
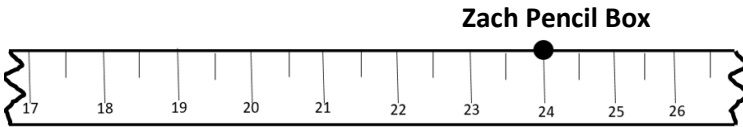


Think: Do I need to add or subtract? [Pause.] **Is the dresser bigger than the desk? Or smaller?** [Pause.]

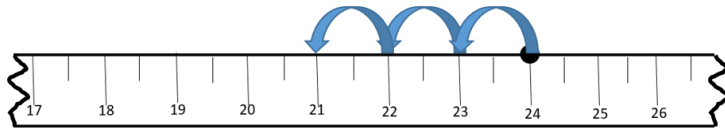
Students respond that they need to subtract because we are finding the difference.

We have to go to the left because Tim's jump is smaller than Michelle's jump.

Objective 2:
 Students add using a number line and ruler to find missing lengths.

<p>Great thinking! The text tells us that the desk is 64 and that the dresser is 7 centimeters LONGER. I marked 64 centimeters on the meter stick. Now we need to move 7 centimeters larger, or to the right.</p>  <p>We moved 7 spaces, or 7 centimeters, landing on 71. Why did we move 7 centimeters? [Pause.]</p> <p>Right! Because we added 7 centimeters for the dresser. What do you think the 71 means? [Pause.]</p> <p>Wonderful! That means the dresser is 71 cm long. I am going to write the equation $64 + 7 = 71$ to match our model.</p> <p>We have used yardsticks to help us add on and subtract lengths. Let's practice a little more to make sure we know when to add and when to subtract!</p>	<p>The number is getting bigger because the dresser is larger than the desk.</p> <p>Students respond.</p> <p>Students respond.</p>
<p><u>Guided Practice</u> (12 minutes)</p> <p>I Do</p> <p>Read the problem along with me:</p> <p>Zach's pencil box is 24 centimeters long. Joe's pencil box is 3 centimeters shorter than Zach's. How long is Joe's pencil box</p> <p>Make the model with me and then we will compare. I am going to draw part of a meter stick. I don't have room to draw the whole thing! Draw your meter stick with me. You will draw a long rectangle. Place 10 dashes as evenly as you can across the top of the rectangle. Label the dashes 17, 18, 19, 20, 21, 22, 23, 24, 25, and 26.</p>  <p>Hold your meter stick up and we will compare. [Pause and compare.] Let's put a dot on 24, because that is our starting point.</p> <p>Think: Do I need to add or subtract? [Pause.] Is Joe's box bigger or smaller than Jack's box? [Pause.]</p>	<p>Students read the problem.</p> <p>Students draw model.</p> <p>Students compare with the teacher.</p> <p>I think that Joe's box is smaller.</p>

Great reading! The text tells us that Joe's box is 3 centimeters SHORTER than Zach's, so we will move to the left on the meter stick. Move these spaces with me.



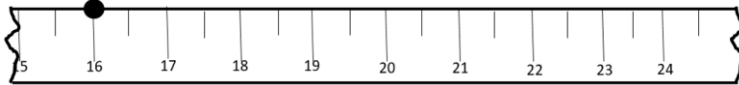
We ended at 21 centimeters. Tell me what that means!
[Pause.]

Let's write the equation for our model. $24 - 3 = 17$. Zach and Joe are compare pencil boxes, but Emilie is throwing a ball. I wonder if we could help Emilie solve her problem.

Read the problem with me:

Emilie threw a gray ball and a black ball. She threw the gray ball 16 feet. She threw the black ball 8 feet farther. How far did Emilie throw the black ball?

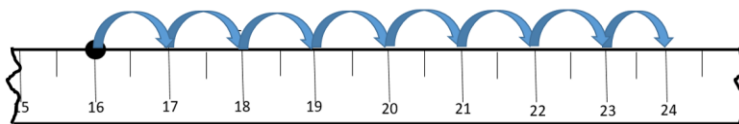
Let's draw the model together. We will start with a long, skinny rectangle. Make 10 dashes, as evenly spaced as you can, across the top. We will label the dashes beginning at 15. Let's compare. [Pause.]



Think: Do I need to add or subtract? [Pause.]

Great reading, again!

The text tells us that the ball went 8 feet FURTHER, or to the right. We are starting at 16 feet. Graph that with me.
[Pause.] **Would you move 8 feet to the right? Use arrows to show that you are moving spaces. I'll do the same on my model.**



Let's compare. [Pause.] **Why did we move 8 spaces?** [Pause.]

Great work!

Right... we move 8 spaces to the right because the second ball went 8 feet farther than the first one. We end up at 24 feet, which means the second ball flew 24 feet.

Students make jumps on their model.

It means that that Joe's pencil box is 21 centimeters long.

Students write the equation.

Students read the problem with the teacher.

Compare with the teacher's model.

Student says that we need to add.

Students draw the model, and graph the starting point of 16.

Students move 8 feet to the right, using arrows.

We moved 8 spaces because the second ball went 8 feet further.

Students write the equation.

Write an equation that matches our model with me: $16 + 8 = 24$.

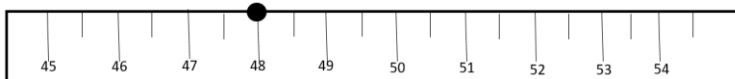
We Do

I do believe we are getting the hang of this! Let's figure out how tall Tyler is.

Read the problem with me.

Tyler was 48 inches tall in January. He grew 6 inches during the year. How tall is Tyler at the end of the year?

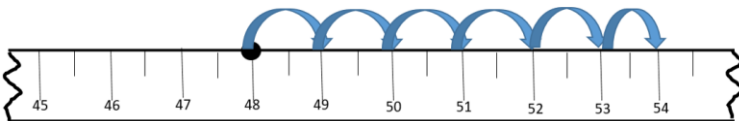
Create the model with me. Draw a rectangle with 10 evenly spaced dashes like before. We will start numbering at 45. Hold up your model when you are finished. [Pause.]



Think: Do I need to add or subtract? [Pause.] Great reading, again! I heard you say that we needed to add the 6 inches because Tyler got bigger.

Move the correct number of spaces and then write an equation to match your model as I am doing the same. We will compare in a minute. [Pause.]

Ok!! Let's compare our models and our equations!

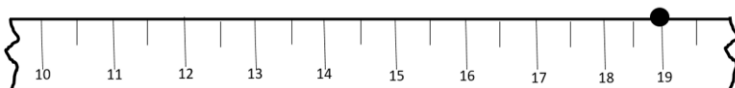


**An equation that matches our model is $48 + 6 = 54$.
Tyler is now 54 inches tall!**

You Do

Read the story on your own. [Pause.] Now read it with me. Ian caught a fish that was 8 inches shorter than his sister Molly's fish. Molly's fish was 19 inches long. How long was Ian's fish?

Draw a ruler with 10 dashes. Label the first dash 10 and then continue to label. Graph the starting point and then we will compare models. [Pause.]



Students read the problem.

Students draw the model.

We are going to add because he got bigger, he grew.

Students move the spaces on the model using arrows and then write and solve the equation.

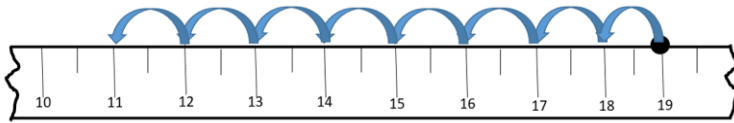
Students compare model and equation with teacher.

Students read the story on their own.

Students read the story with their teacher.

Students draw the model and compare with the teacher's model.

Think: Do I need to add or subtract? [Pause.]
Finish the model and write the equation. [Pause.]
Let's compare.



$$19 - 8 = 11$$

Molly caught 19 fish. Ian caught 11, which is 8 less than 19.

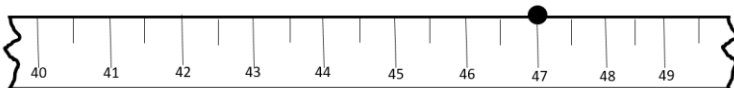
Additional Problems (if Needed):

You Do

#1. Read the story on your own. [Pause.]

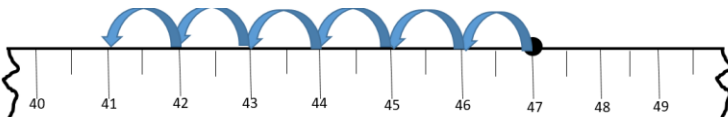
Now read it with me.

**Ming is 6 inches taller than Brian. Ming is 47 inches tall.
 How tall is Brian? Solve using a model and an equation. We'll
 make the model together.**



Think: Do I need to add or subtract? [Pause.]

**Excellent job, going back to the text! Ming is taller than Brian
 by 6 inches, so we will move backwards 6 spaces, or 6 inches.
 Finish the model and your equation and then we will
 compare.** [Pause, then compare.]



**An equation that matches our model is $47 - 6 = 41$. Brian is
 41 inches tall.**

#2. Read the story on your own. [Pause.]

Now read it with me.

**Bill's treehouse is 40 inches off of the ground. Paul's house is
 9 inches higher.**

Students think that they need to subtract because Ian's fish was smaller than Molly's fish.

Students finish model and write the equation.

Students will read the story on their own.

Students will create model and compare.

Students will respond that this is a subtraction problem.

Students will finish model and equation and then compare.

Students read the problem on their own.

<p>We have been drawing models to solve length problems. This time, I want you to picture the model in your head. [Pause.] Think: Is this an addition or subtraction problem? Write an equation to show how high Paul's tree house is. [Pause.]</p> <p>Great work! The equation is $40 + 9 = 49$. Paul's treehouse is 49 inches off of the ground!</p>	<p>Students visualize the model in their heads and decide that this is an addition situation.</p> <p>Students decide that Paul's treehouse is 49 inches above the ground.</p>
<p><u>Independent Practice</u> (1 minute) This section provides a wrap up on content and calls out that there will be independent practice for the student following the video. In lower grades if there are contextual problems, this may allow time for the problem to be read to the student (See grade 1 lessons 1-5 for a model of this if needed.)</p> <p>Great work, math friends! Today, we used models to help us solve addition and subtraction problems with length. I hope you're seeing some connections adding on and counting back! You sure did a great job!</p> <p>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. [Teacher shows student practice page under document camera or camera zooms in on student practice page.]</p> <p>Have fun and do your best!</p>	
<p><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!</p>	

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