

Math: Grade 3, Lesson 11, Area

**Lesson Focus:** Use unit squares to find the area of a figure.

**Practice Focus:** Students will focus on practicing using different sized unit squares and counting unit squares to find the area of a shape with a focus on non-standard unit squares.

**Objective:** Students will count different sized unit squares to find the area of a shape and to notice that the size of the unit square determines the area measurement.

**Key Vocabulary:** unit square, area, cover, square units

**TN Standards:** 3.MD.C.6

**Teacher Materials:**

- Paper, pencil, and dry erase board/marker
- Student practice packet

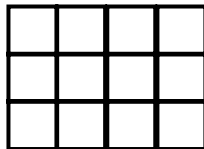
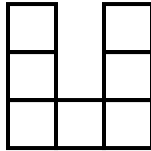
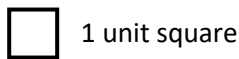
**Student Materials:**

- Paper and a pencil, and a surface to write on

Teacher Do	Student Do
<p><u>Opening (1 min)</u></p> <p><b>Hello! Welcome to Tennessee’s At Home Learning Series for math! Today’s lesson is for all our 3rd graders out there, though all children are welcome to tune in. This lesson is the eleventh in our series.</b></p> <p><b>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!</b></p> <p><b>If you didn’t see our previous lesson, you can find it on the TN Department of Education’s website at <a href="http://www.tn.gov/education">www.tn.gov/education</a>. 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.</b></p> <p><b>Today we will be learning about using different sized unit squares to find the area of a figure! Before we get started, to participate fully in our lesson today, you will need:</b></p> <ul style="list-style-type: none"><li>• Paper and a pencil, and a surface to write on</li><li>• Student packet for Math, Grade 3, Lesson 11 which can be found at <a href="http://www.tn.gov/education">www.tn.gov/education</a>.</li></ul> <p><b>Ok, let’s begin!</b></p>	<p>Students get materials ready for the lesson.</p>

Intro (5 min)

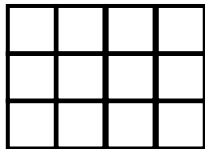
First, let's review how to measure area. We measure area by counting the number of unit squares that covers a shape with no gaps or overlaps. A unit square is a square with sides that are each one unit long. A unit square has an area of one square unit. [Teacher shows the images below.] Look at these figures. I can measure their area by using the unit square.



For the U-shaped figure, I see 7 unit squares that cover the figure without any gaps or overlaps. [Teacher counts each unit square in the figure out loud while pointing to each unit square.] One, two, three, four, five, six, seven. This figure has an area of 7 unit squares.

Can you help me with the second figure? What do you think its area is? [Pause.] Let's count the unit squares together. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12. Give me a thumbs up if you knew the area of the second figure was 12 square units? [Pause.] Great job!

When you are finding the area of a figure, it's okay to put a dot or a number inside each unit square to keep track of your count. And sometimes, you can skip count! I bet some of you skip counted by 4 on the second figure. [Teacher shows the second figure again.]



You may have seen that there were four unit squares in each row. Your skip count would be 4, 8, 12. Either way, we get 12 unit squares for the area of the second figure.

Students actively listen to teacher.

Students think about the area of the second figure.

Students count the unit squares along with the teacher.


Students give a thumbs up for finding 12 unit squares.

Teacher Model (10 min)


Objective 1: Teacher modeling using different-sized unit squares to find area for the same figure.

**We just reviewed how we can find area by counting unit squares that cover the inside of a figure. Today, we'll continue to find area but we'll use different-sized unit squares to see how the unit square size affects the area measurement.** [Teacher shows images of postcards below.] **Here's an area problem we can solve together.**



 = 1 square unit



 = 1 square unit

**Let's find the area of the postcards on each grid. What do you notice about the size of the postcard on each grid?** [Pause.] **If you can picture the postcards without the grids, you'll see that they are the same postcard. What do you notice about the area of the postcard on each grid?** [Pause.] **Remember earlier we reviewed that we can find area by counting the unit squares that cover a figure. What do you notice about the size of the unit square in the top grid and the size of the unit square in the bottom grid?** [Pause.] **Do the sizes of the unit squares change the area measurement?** [Pause.]

**Now that you've had some time to think, let's talk about it. I notice that the square units in the top grid are smaller than the square units in the second grid. That means it will take more of the smaller square units to cover the postcard. Give me a thumbs up if you got an area of 24 square units for the postcard in the top grid?** [Pause.] **Since the square units for the postcard in the second grid are larger in size, do you think the area of the postcard in the second grid will also be 24 square units?** [Pause.] **No, in the second grid, we won't need 24 square units to cover the postcard since the square units in this grid are larger. The area of the postcard in the second grid is 6 square units. Pat yourself on the back if you also**

Objective #1:

Students will be using their prior knowledge of counting unit squares to find area, but for this problem, they will use different-sized unit squares. This will allow students to understand that area measurement can change depending on the size of the unit squares.

Students actively listen to teacher think aloud and guided questioning as they find the area of the postcard in each grid.

Students give a thumbs up for finding an area of 24 square units in the top grid.

**found the area to be 6 square units in the second grid! So even though we are using the same postcard, the size of the square units matter! The size of the square units can change the area measurement.**

Objective 2: Teacher modeling/guided practice on using different-sized unit squares to find area.

**Before we solve another area problem, let's think about the meaning of area. What are we measuring when we measure area? [Pause.] The number of unit squares needed to cover a region or space with no gaps or overlaps. What words do we use to describe area? [Pause.] We can count the number of unit squares to find area, but we describe area with square units. For example, the area of the postcard in the second grid was 6 square units. Can unit squares be different sizes? [Pause.] Yes, unit squares can be different sizes. The size of the unit square determines the area measurement.**

**Now we're ready for this next problem. Tran designs a bookmark for a book. How can he use unit squares to find the area of the bookmark? [Teacher shows the bookmark image and the two different-sized unit squares.]**



**Let's find the area of the bookmark using the smaller-sized unit square. [Teacher shows the image below.] We can count the number of unit squares to find the area. Count with me! 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32.**

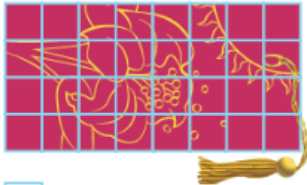
**Did anyone skip count by eights since there are eight unit squares in each row? Let's skip count together and see if we get the same area. 8, 16, 24, 32. Yes, either way, we counted 32 unit squares so the area of the bookmark using this unit square is 32 square units.**


Students check their answer for the area in the second grid.

Objective 2: Students will review the meaning of area and square units and then continue to find the area of figures by counting different-sized unit squares. They will gain more conceptual understanding about how the size of the unit square changes the area measurement.

Students count out loud with teacher to find the area of the bookmark when using the smaller-size unit squares.


Students skip count by eight with teacher.



 = 1 square unit

[Teacher shows image below.] **Now let's use the larger-sized unit square. How do you think that will change the area?**  
[Pause.] **I'll give you a minute to find the area before we talk about it.** [Pause.]



 = 1 square unit

**Did you find an area of 8 square units? Why is this area different from the first area for the bookmark?** [Pause.] **Yes, since we used a larger unit square to measure the area, the number of unit squares we count will be less because we will need fewer to cover the bookmark. Give yourself some applause if you knew we'd get a smaller area measurement with the larger-sized unit square.**

Tying the learning together: Explicit Instruction, Example(s), Guided Practice

**In the postcard problem and in the bookmark problem, we found the area of the same-sized object using different-sized unit squares. This made the area measurement different. Now let's use reasoning and our knowledge of counting unit squares to find area of figures when the figures are different sizes, but have the same area measurement.**

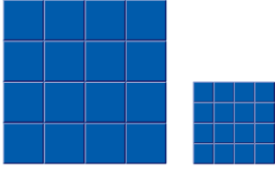
**Look at these two squares.** [Teacher shows squares below.] **How are the areas of these two squares alike and how are they different?** [Pause.]

Students find area of bookmark using the larger-sized unit square.

Students check their answer for area using the larger-sized unit square.

Students give themselves applause for knowing the area measurement would be a smaller number with the larger-sized unit square.

Students study the squares and consider how their areas are alike and how they are different.



**How are the area of two squares alike?** [Pause.] **What is the area of the larger square?** Give me a thumbs up if you found the area is 16 square units. [Pause.] **Great! Now what is the area of the smaller square?** [Pause.] **What? Did you say it also has an area of 16 square units?** Interesting. So the areas of the two squares are alike because they both have an area of 16 square units.

**Now how are the areas of the two squares different?** [Pause.] **That's right! The areas are different because the unit squares are different sizes.** [Teacher points out the different-sized unit squares in the images.] **Also, the areas are different because they the amount of space they cover are different too.**

**You were able to solve this problem using what you already know about area and unit squares! Are you understanding that the size of the unit square determines the area measurement? Let's practice this concept more with some guided practice.**

Students give a thumbs up for finding that the larger square has an area of 16 square units. Students notice that they should have 16 square units for both squares.

Students listen to how the areas are different.

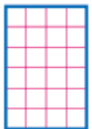
### Guided Practice (10 min)

[I do.]

**I'll do the first practice problem.**

[Teacher reads the problem out loud and does a think aloud as she solves it.]

**Draw unit squares to cover the figures and find the area. Use the unit squares shown.** [Teacher shows the figures below.]

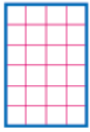



 = 1 square unit     = 1 square unit

**The unit squares are drawn for me in the first rectangle. I can count the unit squares to find the area. I see four unit squares in each row so I will skip count by four. 4, 8, 12, 16, 20, 24. I counted 24 unit squares so that means the area in the first rectangle is 24 square units.** [Teacher writes Area = 24 square units under projected image.]

Students actively listen to teacher reading the problem.


Students actively listen to teacher think aloud.




 = 1 square unit

**To find the area of the rectangle with the larger-sized unit squares, I need to draw the unit squares inside the rectangle. I have to make sure I have no gaps or overlaps.** [Teacher shows rectangle with unit squares inside.]



 = 1 square unit



 = 1 square unit

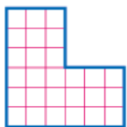
**I have 1, 2, 3, 4, 5, 6 unit squares in this rectangle so the area of this rectangle is 6 square units.** [Teacher writes Area = 6 square units under projected image.]


**I had the same-sized rectangles, but I knew I would have two different area measures because I used different-sized unit squares. It makes sense to me that larger the size of the unit square, the few unit squares it takes to cover the figure. I hope it is making sense to you!**

[We do.]


**Now let's do this next problem together.**

**Draw unit squares to cover the figures and find the area. Use the unit squares shown.** [Teacher shows the figures below.]



 = 1 square unit



 = 1 square unit

**Notice that the two figures are the same size. The unit squares have been drawn for us in the figure on the left. Go ahead and find the area of this figure now.** [Pause.]

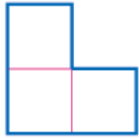
**Give me a thumbs up if you found the area to be 27 square units. Awesome!** [Record Area = 27 square units under the image.]

Students give a thumbs up to indicate they found an area of 27 square units.

Now we need to find the area of the figure on the right. Notice that we have a different-sized unit square to use this time. Can you visualize how many unit squares will cover the figure? [Pause.]

Copy the figure on your paper and draw the unit squares that will cover the figure. When you have drawn the unit squares, find the area. [Pause.]

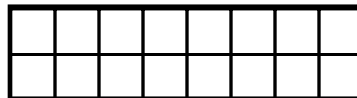
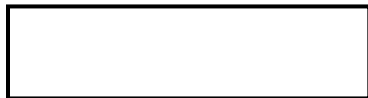
Show me using your fingers how many unit squares you drew to cover the figure. [Pause.] Yes, 3 unit squares! So the area is 3 square units. [Draw in 3 unit squares to look like the image below. Record Area = 3 square units under the image.]



[You do.]

Now you try one by yourself!

Draw unit squares to cover the figures and find the area. Use the unit squares shown. [Teacher shows the figures below.]



= 1 square unit



= 1 square unit

Go ahead and find the areas. The unit squares are already drawn for you in the rectangle on the right. When you find the areas, record Area = \_\_\_\_ square units under each rectangle. [Pause.]

Do your answers make sense? Say out loud what you found for the area of the rectangle on the right. [Pause.] For the rectangle on the right, the area is 16 square units. [Teacher records Area = 16 square units under the rectangle on the right.] Show me with your fingers how many unit squares you drew to cover the rectangle on the left. [Pause.] Great! For the rectangle on the left, you should have drawn 4 unit squares to cover the space inside that rectangle. [Teacher draws four unit squares inside the rectangle on the left.] So the area for the rectangle on the left is 4 square units. [Teacher records Area = 4 square units under the rectangle on the left.]

[Additional problems if needed.]

Students copy the figure on their paper and draw in 3 unit squares.

Students hold up 3 fingers to indicate the figure has an area of 3 square units.

Students solve the problem alone.

Students count 16 unit squares in the rectangle on the right. Students draw 4 unit squares to cover the space inside the rectangle on the left.

Students verbalize the area is 16 square units.

Students hold up 4 fingers to show how many unit squares they drew. Students make sure they have recorded Area = 16 square units and Area = 4 square units under the correct rectangles.




Ben finds that the area of this figure is 14 square units. Draw unit squares to cover this figure.



Ria estimates that the area of this figure is 45 square units. Martin estimates the area is 48 square units. Whose estimate is closer to the actual measure? Explain.



 = 1 square unit

Draw a figure and cover it with unit squares to find the area. Draw the same figure again. Use a unit square with a different size to find the area.

#### Independent Practice (10 min)

**Great work, students! Today, we reviewed counting unit squares to find the area of a figure. We applied this knowledge to finding areas of a shape with different-sized unit squares. I hope it's making sense to you that the size of the unit square determines the area measurement. You sure did a great job! 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](http://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!**

Students listen to teacher summarize today's learning and view the independent practice problems.

#### Closing (1 min)

## PBS Lesson Series

<ul style="list-style-type: none"><li>• Students, I enjoyed reviewing counting different-sized unit squares to find the area of a shape and learning that the size of the unit square determines the area measurement! 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!</li><li>• Bye!</li></ul>	
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