On Core Lessons
for Common Core Math

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Promethean

Using the Whiteboard Use the table of contents to go to specific sections of the lesson, or tap **Next** to go to the first section of the lesson.

Teaching the Math Discuss the *Essential Question* with students: How can you use a formula to find the area of a rectangle?

Common Core Standards for Mathematical Content

CC.4.MD.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems.

Common Core Standards for Mathematical Practice

CC.K–12.MP.7 Look for and make use of structure.

CC.K–12.MP.8 Look for and express regularity in repeated reasoning.

Navigating the *SMART Notebook* file

	**Home**	Return to the Main Menu.		**Example**	View a sample problem.
	**Teacher Notes**	Open the Teacher Notes PDF.		**Answer**	Show the correct answer to a problem.
	**Previous**	Go to the previous page.		**Try Another**	Generate another problem for extra practice.
	**Next**	Go to the next page.		***SMART Response* Question**	Indicates the question is compatible with a *SMART Response* interactive Response system.
	**Action Arrow**	Reveal hidden content.			
	**Try This**	Reveal additional problems. Tap again to return to the previous page.		**Workspace**	Reveal additional content for the activity. Tap again to return to the previous page.

Tips

Clear or reset the screen To reset the screen, tap **Edit > Reset Page** or tap the **Reset Page** button if it is on the toolbar.

Add tools and functions to your *SMART Notebook* toolbar or floating palette

Tap the **Customize** button in the toolbar or floating palette, and then drag the tool to the toolbar or floating palette.

Using the Whiteboard

- Pull out the Remember tab and discuss the base and height with students.
- Tap the first **Action Arrow** to reveal information about area.

Teaching the Math

It is important that students develop the area formula themselves. Substituting numbers into a formula may teach computation, but it does not allow students to increase their conceptual knowledge of the way formulas are derived.

As the words *base* and *height* are introduced, explain that students may have seen these sides labeled as *length* and *width*. Instruct students to use the terms *base* and *height* because this will help them make the connection to other formulas that are derived from the formula of a rectangle.

Explain that the area of a figure must be measured in square units that are the same size and do not have gaps or overlap. Help students understand that a square unit is described by the space inside the closed unit. Show that area is a measure that incorporates two dimensions—length and width, or base and height.

Remind students that perpendicular lines and perpendicular line segments form right angles.

Ask: Can the base and height of a rectangle be parallel to each other? No; they must be perpendicular to each other. Adjacent sides of a rectangle form right angles.

Using the Whiteboard

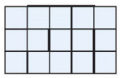
- Discuss the problem with students.
- Ask a student to use the **Eraser** to reveal the complete table.
- Tap **Math Talk** to reveal a discussion question.

Teaching the Math

Ask: Why does it not matter which side is the base? When multiplying two numbers, the Commutative Property of Multiplication allows the factors to be multiplied in any order and the product remains the same.

Ask: Instead of counting squares in rows and columns, can you think of a shortcut for finding the area of each rectangle? I can use the numbers given for the base and height and multiply them together to find the area.

Answer Key

Figure	Base	Height	Area
	5 units	3 units	15 square units
	2 units, or 8 units	8 units, or 2 units	16 square units
	3 units	3 units	9 square units

Math Talk

Possible answer: any side of the rectangle can be used as the base.

Using the Whiteboard

- Pull out the Math Idea tab and discuss the problem with students.
- Tap the first **Action Arrow** to reveal Part A.
- Ask a student to use the **Pen** to complete the equation steps.
- Tap the second **Action Arrow** to reveal Part B.
- Ask another student to use the **Pen** to complete the equation steps.
- Tap **Try This,** and have a volunteer use the **Pen** to write his or her answers in the space provided.

Teaching the Math

Ask: In the formula $A = b \times h$, what does the A represent? area What does the b represent? base What does the h represent? height

Ask: What operation does the formula require you to use? multiplication

Ask: What are the factors in the formula? base and height What is the product? area

Have volunteers explain the process of using the area formula. Students' explanations can include the following:

- Use the labeled numbers for the base and the height.
- It does not matter which number I place first in the formula.
- Multiply the base and the height, and label the area with square units.

Try This!

Discuss with the class how the area of a square can be written as $A = s \times s$, where s is the length of each side, since a square has a base that is equal to its height.

Answer Key

$A = b \times h$

$= 6 \times 2$

$= 12$

The area is 12 square feet.

$A = b \times h$

$= 2 \times 4$

$= 4$

The area is 4 square meters.

Try This!

Possible answers:

Use the letter A for area.

Use the letter s for the length of a side.

Formula: Possible answer: $A = s \times s$

Using the Whiteboard

- Pull out the Formula tab and review with students.
- Tap the **Action Arrow** to reveal the problem.
- Have a volunteer use the **Pen** to complete the formula and write values for *b* and *h.*
- Ask students to solve the problem.
- If available, have students use their *SMART Response* remotes to answer.
- If installed, click the *SMART* Response tab, and then start the question to begin voting.
- Direct a student to write his or her answer on the blank line with the **Pen.**

Teaching the Math

The problem connects to the learning model.

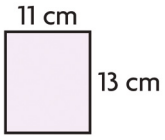
Common Errors

Error Students mislabel the area.

Example 12 yards instead of 12 square yards

Springboard to Learning Emphasize that area is the number of square units needed to cover a flat surface. Therefore, the label must be square units.

Answer Key



$A = b \times h$

$= 11 \times 13$

$= 143$ sq cm

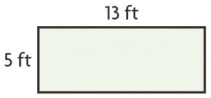
Using the Whiteboard

- Pull out the Formula tab for reference and discuss the problem with students.
- Ask a student to use the **Pen** to write his or her answer in the space provided.
- Tap **Try Another!** to reveal another problem.
- Repeat these steps until all six problems have been solved.

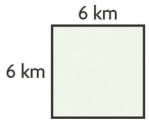
Teaching the Math

Point out the Formula tab for student reference.

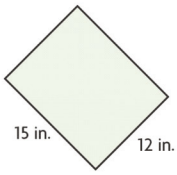
Answer Key



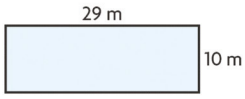
65 sq ft



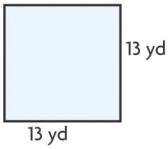
36 sq km



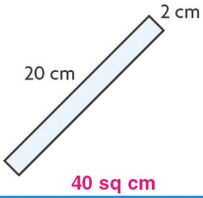
180 sq in.



290 sq m



169 sq yd



40 sq cm

Using the Whiteboard

- Read the question to the students.
- Tap the **Workspace** button and ask a student to use the **Pen** to write the answers.
- Tap the **Workspace** button again to return to the previous page.
- Ask students to solve the problem.
- If available, have students use their *SMART Response* remotes to answer.
- If installed, click the *SMART* Response tab, and then start the question to begin voting.
- Students may also use the **Pen** to circle the answer.
- Tap **Answer** to reveal the correct answer.

Teaching the Math

Allow students to underline the dimensions of the gardens and draw illustrations if needed.

Ask: What do you need to find? who drew the garden plan with the greater area and what the area is

Ask: What formula will you use? $A = b \times h$

Ask: What units will you use to write the answer? square feet

Answer Key

Show the steps to solve the problem.

Find the area of Nancy's garden.
$18 \times 12 = 216$ square feet.

Find the area of Luke's garden.
$15 \times 15 = 225$ square feet.

Compare the areas.
$225 > 216$, so Luke's graden has a greater area.

Complete the sentences.

The area of Nancy's garden is 216 sq ft.

The area of Luke's garden is 225 sq ft.

Luke's garden has the greater area.

D) Luke; 225 square feet

Using the Whiteboard

- Read the question to the students.
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Teaching the Math

The H.O.T. Problem requires students to use higher order thinking skills to determine the area when each square represents more than one square unit.

Answer Key

D) 384 square feet

Using the Whiteboard

- Read aloud the *Essential Question*: How can you use a formula to find the area of a rectangle?
- Instruct a volunteer to use the **Pen** to write his or her answer.
- Pull out the Answer tab to reveal a possible answer.

Answer Key

Essential Question

Possible answer: I can use the lengths of the base and height in the formula $A = b \times h$ and multiply to find the area in square units.