

## NCSC UDL Unit Concept Reinforcement Activity for Math ES Lesson 4

*If the student has not had experience (or has had very little experience) with the concepts of perimeter and area or the skill of calculating perimeter or area, it might be helpful to provide instruction using this Concept Reinforcement Activity (CRA) before the Introduction to Lesson 4. It might be helpful to provide the exploratory activity both before starting Lesson 4 and again after the Introduction of Lesson 4. Provide the scripted activity and data collection prior to the Body of Lesson 4. Just as with any other student, it is unlikely that he/she will learn these concepts or skills after receiving instruction only once, so you can provide this activity at other times during the unit. But do not expect or require mastery of this CRA before the student takes part in the unit. The CRA is supplemental instruction and should only be provided **in addition to** the instruction in the unit; it does not take the place of the unit.*

**Key Vocabulary:** The following key vocabulary terms are used in the reinforcement activities and the unit. It is important to provide these terms in the student’s communication system and describe the meaning using the definitions in the unit as provided or paraphrased as needed. The purpose is to build understanding of the terms rather than teaching the student to recite the definitions. For example, when identifying the perimeter in each activity, consistently state, “This is the perimeter; it is the edges around this.” Model the use of the communication system when talking about area and perimeter.

Unit Definition	Possible Paraphrased Definition
<b>Area</b> – the amount of space an object occupies	<b>Area</b> – the space inside the edges of a figure
<b>Perimeter</b> – the distance around a figure along its edges	<b>Perimeter</b> – the edges around a figure

## Exploratory Activity

**Purpose:** *The orientation activity is designed to build an understanding of perimeter and area.*

1. Provide a description of perimeter and area verbally and in some type of concrete representation (e.g., drawing of a rectangle with the edges being one color or texture and the middle being a different color texture; label each part of the rectangle).

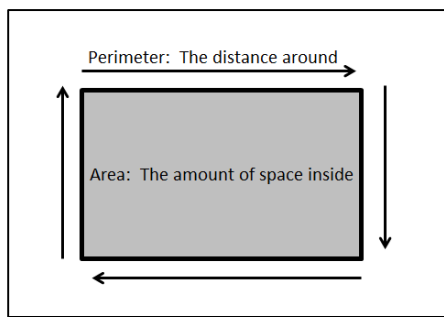


Figure 1 Example of representation of area and perimeter

2. Provide pictures or drawings of familiar 2-dimensional or plane figures without curves (e.g., classroom door, home door, top of desk, traffic signs, book, box of crayons, puzzle pieces, cafeteria tray, etc.). Note that the actual objects can be used as long as the student is able to focus on the plane being measured and not be confused by the other dimensions (e.g., height).
3. Allow the student to practice the concept of perimeter and area with some or all of the following activities:
  - a. Model tracing the outside of each figure with your finger or marker, and assist the student to trace while stating, "This is the perimeter."
  - b. Model tapping the middle of each figure with your finger, and assist the student to do the same while stating, "This is the area."
  - c. Place craft sticks, pipe cleaners, wax sticks, licorice ropes, etc. around the perimeter while stating, "This is the perimeter.", and have the student do the same on a duplicate figure.
  - d. Place square pieces of paper, tiles, small crackers, etc. inside of the same figure while stating, "This is the area.", and have the student do the same on a duplicate figure.

- e. Create a large 2-dimensional or plane figure without curves on the floor using tape. Assist the student to move around the tape while stating, “This is the perimeter.” Assist the student to stand or sit inside the figure and state, “This is the area.”
  - f. Place various size 2-dimensional or plane figures without curves on a grid and model counting around the perimeter. Assist the student to touch (or otherwise indicate) each grid cell around the outside of the figures and state, “This is the perimeter.”
  - g. Create a transparent grid (e.g., on transparency paper, plastic page protector, clear CD case), place over various size 2-dimensional or plane figures without curves on a grid, and model counting the grid cells inside the figures. Assist the student to touch (or otherwise indicate) each grid cell inside the figure and state, “This is the area.”
4. Use systematic instruction (see *NCSC Instructional Resource Guide*) to teach the student to identify the perimeter and area.

### Scripted Activity with Data Collection

**Purpose:** *This activity is designed to provide extra practice to learn or refine the skills of calculating perimeter and area, which will be used throughout this unit. The activity provides extra instruction on the concepts of perimeter and area and using formulas to calculate each. The perimeter portion can be used for working with regular and irregular polygons. The area portion can be used for working with rectangles. The activity also provides extra opportunities for instruction on using a tool to measure (see Concept Reinforcement Activity Lesson 1).*

There are three versions – Version A, Version B, and Version C. Each version follows the same instructional script, but the materials are different (provide whatever individualized supports your student needs to interact with the materials). Use as many versions of the activity as your student needs to further develop the skill; you may need to only do one version or you may need to do all three. Mastery of this skill is not expected nor required to continue working within this unit. Instead, this activity should be used solely as practice whenever it can be worked in during instruction on the unit or at other times during the school day. It does not take the place of instruction with peers on the UDL unit, rather, it supplements that instruction.

Based on the student and the skill, choose any one of the instructional strategies from the *NCSC Instructional Resource Guide* to use during instruction throughout the practice activity. Use the data to give you more information on what part of the skill the student may need more focused instruction on throughout the unit.

*Materials and Directions for Teacher*  
**(Perimeter Activity)**

Version A: Provide a plane or 2-dimensional figure in the shape of a square, ruler, inch cubes, or inch squares of paper, calculator.

Version B: Provide a plane or 2-dimensional figure in the shape of a rectangle with pairs of opposite sides that differ in length (e.g., card stock rectangle that is 9 inches long and 6 inches wide), ruler, inch cubes, or inch squares of paper, calculator.

Version C: Provide a plane or 2-dimensional figure in the shape of a triangle, ruler, inch cubes, or inch squares of paper, calculator.

*Use figures that can be measured using whole units instead of figures that use partial units of measure (e.g., a book that measures 9 inches long instead of a book that measures 9 ½ inches).*

<i>Instructional Cue</i>	<i>Student Expected Response</i>	Version A Date:	Version B Date:	Version C Date:
<p><i>As you read the script, indicate the sides of the figure the student will be measuring.</i></p> <p><b><i>“The outside edges or the sides of figures are the perimeter. When we are finding the perimeter of a figure, we only look at the outside edges. Show me the perimeter of this figure.”</i></b></p>	<p>The student indicates the outside edges of the figure.</p>			
<p><i>Demonstrate measuring each side as you read the script. Use the tool (ruler or inch cubes or paper squares) that the student will be using.</i></p> <p><b><i>“We have to measure each side to find the perimeter. To help us remember our measurements, I’ll write down the length of each side. Now you measure each side of this figure.”</i></b></p>	<p>The student measures each side.</p>			

<p><i>Point out the number that has been written to indicate the length of each side as you talk about it. Demonstrate how to make tally marks, or count out inch cubes of paper squares-- whichever the student will be doing. If the student already knows the value of the numbers representing the length, you do not have to have him/her count the number of manipulatives, but this will reinforce number sense for students who need extra practice.</i></p> <p><b><i>“To find the perimeter, we need to add the lengths of all of the sides together. The length of this side is (insert number) inches. Count out (insert number).”</i></b></p> <p><b><i>“The length of this side is (insert number) inches. Count out (insert number).”</i></b></p> <p><b><i>“The length of this side is (insert number) inches. Count out (insert number).”</i></b> Stop here for Version C. Continue one more time for Versions A &amp; B.</p> <p><b><i>“The length of this side is (insert number) inches. Count out (insert number).”</i></b></p>	<p>The student tallies or counts out inch cubes of paper squares to indicate the length of each side.</p>			
<p><i>Demonstrate counting using tally marks or inch cubes of paper squares (whichever the student will be doing) as you read the script.</i></p> <p><b><i>“To find the perimeter, we need to add the lengths of all of the sides together. Add all of the sides together to find the perimeter.”</i></b></p>	<p>The student counts sequentially from “1” to the end and stops counting.</p>			

<p><b><i>“When we tell the perimeter of something, we say the number and the name of the unit of measure. The perimeter of this figure is (insert number and unit of measure). Tell me the perimeter of this figure.”</i></b></p>	<p>The student includes both the number and the unit of measure when answering.</p>			
<p><i>Demonstrate substituting each “L” in the equation with a number as you read the script.</i></p> <p><b><i>“We can use an equation like this (L + L + L + L = ___ [Versions A &amp; B] or L + L + L = ___ [Version C]) to show how to calculate perimeter. Instead of “L”, we put in the length of each side. Now you do it.”</i></b></p>	<p>The student indicates the number each “L” represents.</p>			
<p><i>Demonstrate using the equation and a calculator as you read the script. Figure 2 provides a template for you to use.</i></p> <p><b><i>“We can use this equation and a calculator to check our work. Now you do it.”</i></b></p>	<p>The student uses the calculator to follow the equation.</p>			

*Materials and Directions for Teacher  
 (Area Activity)*

Version A: Provide a plane or 2-dimensional figure in the shape of a rectangle with pairs of opposite sides that differ in length (e.g., card stock rectangle that is 9 inches long and 6 inches wide), ruler, inch cubes, or inch squares of paper, multiplication table/chart, calculator.

Version B: Provide a plane or 2-dimensional figure in the shape of a square, ruler, inch cubes, or inch squares of paper, multiplication table/chart, calculator.

Version C: Provide a plane or 2-dimensional figure in the shape of a rectangle with dimensions that differ from the ones used in Versions A & B, ruler, inch cubes or inch squares of paper, multiplication table/chart, calculator.

*Use figures that can be measured using whole units instead of figures that use partial units of measure (e.g., a book that measures 9 inches long by 6 inches wide instead of a book that measures 9 ½ inches long and 6 ¼ inches wide).*

<i>Instructional Cue</i>	<i>Student Expected Response</i>	<i>Version A</i>	<i>Version B</i>	<i>Version C</i>
		<i>Date:</i>	<i>Date:</i>	<i>Date:</i>
<p><i>As you read the script, indicate the space inside the edges of the figure the student will be calculating.</i></p> <p><b><i>“The space inside the figure is the area. When we are finding the area of a figure, we look at the space inside the edges. Show me the area of this figure.”</i></b></p>	<p>The student indicates the space inside the figure.</p>			



<p><i>Demonstrate filling the inside of the figure with inch cubes or paper squares as you read the script. Use whatever manipulatives that the student will be using.</i></p> <p><b><i>“When we are figuring out the area of a figure, we can fill all the space inside the edges with square units. Now you do it.”</i></b></p>	<p>The student fills the space with manipulatives.</p>			
<p><i>Demonstrate counting all the manipulatives that fill the area of the figure.</i></p> <p><b><i>“We can tell what the area is by counting how many square units are in the space inside the edges. Now you do it.”</i></b></p>	<p>The student tallies or counts the number of manipulatives that represent the area of the figure.</p>			
<p><i>Demonstrate counting using tally marks or inch cubes of paper squares (whichever the student will be doing) as you read the script.</i></p> <p><b><i>“When we tell the area of something, we say the number and the name of the square unit of measure. The area of this figure is (insert number and square unit of measure). Tell me the area of this figure.”</i></b></p>	<p>The student says both the number and the square unit of measure. (verbally; touching the number and unit on an electronic device; pointing to the correct number and word card or picture representations, etc.. (Student must include the word “square” as part of the answer.)</p>			

<p><i>Demonstrate measuring the length as you read the script. Use the tool (ruler or inch cubes or paper squares) that the student will be using. Figure 3 provides a template for you to use.</i></p> <p><b><i>“Another way to find the area of a figure is to multiply. First, we have to find out the length of the figure. The length of this figure is (insert the number and unit of measure). To help us remember our measurements, I’ll write down the length of the figure. Now you measure the length of this figure.”</i></b></p>	<p>The student measures the length of the figure.</p>			
<p><i>Demonstrate measuring the width as you read the script. Use the tool (ruler or inch cubes or paper squares) that the student will be using.</i></p> <p><b><i>“Next, we have to find out the width of the figure. The width of this figure is (insert the number and unit of measure). To help us remember our measurements, I’ll write down the width of the figure. Now you measure the width of this figure.”</i></b></p>	<p>The student measures the width of the figure.</p>			
<p><i>Demonstrate using the equation and multiplication table/chart as you read the script unless the student has memorized the multiplication tables.</i></p> <p><b><i>“We can use this equation “L x W” to multiply the length and width to find the area of the figure. Instead of “L”, we put the length of the figure, and instead of “W”, we put the width of the figure. Now you do it.”</i></b></p>	<p>The student finds the area of the figure.</p>			

<p><i>Demonstrate saying the number and square unit of measure as you read the script.</i></p> <p><b>“The area of this figure is (insert the number and square unit of measure). Tell me the area of this figure (remember to say the number and the square unit of measure).”</b></p>	<p>The student states both the number and the square unit of measure (verbally; touching the number and unit on an electronic device; pointing to the correct number and word card or picture representations, etc.. (The student must include the word “square” as part of the answer.)</p>			
<p><i>Demonstrate using the equation and a calculator as you read the script.</i></p> <p><b>“We can use this equation and a calculator to check our work. Now you do it.”</b></p>	<p>The student uses the calculator to follow the equation.</p>			

### Transition Activity: Back to the UDL Lesson

To help the student develop an understanding of perimeter and area and to work within the UDL unit, it might be helpful to provide the exploratory activity both before starting *Lesson 4* and again after the *Introduction of Lesson 4*. Provide the scripted activity and data collection prior to the *Body of Lesson 4*. Have the student complete the activities in the *Introduction* and the *Body* using

- appropriate systematic instruction as needed
- representation of perimeter and area used in the orientation activity
- scripted activity and data collection when measuring
- *Additional Considerations for Emerging Readers and Emerging Communicators* provided at the end of the lesson (e.g., using a grid so student can count vs. calculate)

Figure 2 Templates for Perimeter

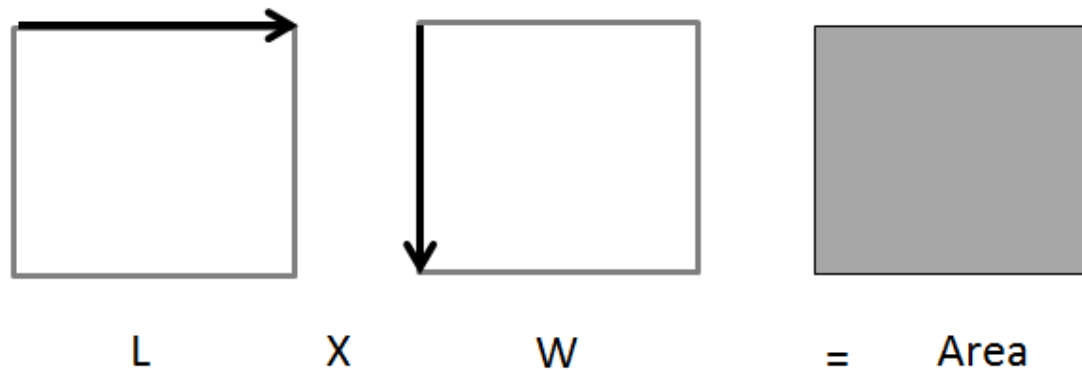
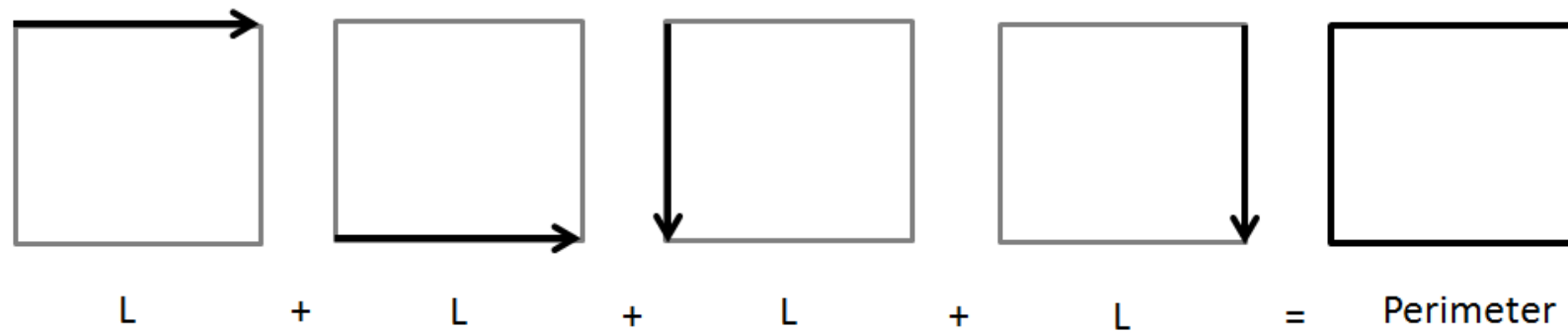


Figure 3 Template for Area