NCSC UDL Unit Concept Reinforcement Activity for Middle School Math Lesson 3

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 area of each side of a 3-dimensional shape, consistently state, "This is the face, the side of the figure." Model the use of the communication system when talking about area and complex shapes.

Unit Definition	Possible Paraphrased Definition
Area – the amount of space an object occupies	**Area** – the space inside the edges of a figure
Face – a flat surface of a 3-dimensional figure	**Face** – the side of figure
Surface area – the total area of all the faces or surfaces of a 3-dimensional figure	**Surface area –** the total area of all the sides of a figure

Scripted Activity with Data Collection

Purpose: This activity is designed to provide extra practice to learn or refine the skills of calculating surface area (of rectangular prisms only) which will be used throughout this unit.

There are three versions for surface area– 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; it supplements that instruction.

Based upon 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 *(Surface Area Activity)*
Version A: 3-dimensional quadrilateral (i.e., rectangular prism), net of the figure, ruler, inch cubes or inch squares of paper, calculator (optional materials: multiplication chart or table) Version B: 3-dimensional quadrilateral (i.e., rectangular prism) with dimensions that are different from the figure used in Version A, net of the figure, ruler, inch cubes or inch squares of paper, calculator (optional materials: multiplication chart or table) Version C: 3-dimensional quadrilateral (i.e., rectangular prism) with dimensions that are different from the figure used in Versions A & B, net of the figure, ruler, inch cubes or inch squares of paper, calculator (optional materials: multiplication chart or table) *Use figures that can be measured using whole units instead of figures that use partial units of measure (e.g., a box that measures 4 inches long, 2 inches high, and 2 inches wide).* **If during the course of your instruction, you find that the student could use more instruction on finding the area of 2-dimensional rectangular shape (that would include calculation of area using a formula and understanding the concept of area), refer back to the scripted activity about area in the elementary school unit Concept Reinforcement Activity.*

Instructional Cue	*Student Expected Response*	*Version A Date:*	*Version B Date:*	*Version C Date:*
As you read the script, indicate the space inside the edges of each face of the figure the student will be calculating. If you feel the student should be using other terminology, please make these substitutions in the script as you read it: • *figure like this = 3-dimensional figure* or *rectangular prism;* • *side = face.* *You may also prompt the student to indicate all of the sides by saying, "Show me another side" until he/she has identified all the sides.* ***Remember that the space inside the edges of a figure is the area. When we are finding the area of a figure, we look at the space inside the edges. On a figure like this that has a lot of sides, we have to look at each side to find the surface area. Show me each side of this figure.***	Student indicates each side of the figure.			
Demonstrate measuring the length and width with whatever tool e.g., ruler, inch cubes) the student will be using. Calculate the area using whatever tool (e.g., multiplication table, calculator) the student will be using. Figure 1 provides a template for you to use. ***When we are figuring out the surface area of a figure like this, the first thing we have to do is to find the area of each side. Remember that to find the area of a rectangle, we use the formula L x W = ___. Watch me. First I measure the length and put that number in the formula. Next I measure the width and put that number in the formula. Using the formula, the area of this side is*** **(insert area in the formula; be sure to use the terminology of "square" units).** ***Now you find the area of this side.***	Student calculates the area.			

Instructional Cue	*Student Expected Response*	*Version A Date:*	*Version B Date:*	*Version C Date:*
Demonstrate measuring the length and width with whatever tool e.g., ruler, inch cubes) the student will be using. Calculate the area using whatever tool (e.g., multiplication table, calculator) the student will be using. Figure 1 provides a template for you to use. ***Now we have to calculate the area of another side. Watch me. First I measure the length and put that number in the formula. Next I measure the width and put that number in the formula. Using the formula, the area of this side is*** **(insert area in the formula; be sure to use the terminology of "square" units).** ***Now you find the area of this side.***	Student calculates the area.			
Demonstrate measuring the length and width with whatever tool e.g., ruler, inch cubes) the student will be using. Calculate the area using whatever tool (e.g., multiplication table, calculator) the student will be using. Figure 1 provides a template for you to use. ***Now we have to calculate the area of another side. Watch me. First I measure the length and put that number in the formula. Next I measure the width and put that number in the formula. Using the formula, the area of this side is*** **(insert area in the formula; be sure to use the terminology of "square" units).** ***Now you find the area of this side.***	Student calculates the area.			
Demonstrate measuring the length and width with whatever tool e.g., ruler, inch cubes) the student will be using. Calculate the area using whatever tool (e.g., multiplication table, calculator) the student will be using. Figure 1 provides a template for you to use.	Student calculates the area.			

Instructional Cue	*Student Expected Response*	*Version A Date:*	*Version B Date:*	*Version C Date:*
Now we have to calculate the area of another side. Watch me. First I measure the length and put that number in the formula. Next I measure the width and put that number in the formula. Using the formula, the area of this side is **(insert area in the formula; be sure to use the terminology of "square" units).** ***Now you find the area of this side.***				
Demonstrate measuring the length and width with whatever tool e.g., ruler, inch cubes) the student will be using. Calculate the area using whatever tool (e.g., multiplication table, calculator) the student will be using. Figure 1 provides a template for you to use. ***Now we have to calculate the area of another side. Watch me. First I measure the length and put that number in the formula. Next I measure the width and put that number in the formula. Using the formula, the area of this side is*** **(insert area in the formula; be sure to use the terminology of "square" units).** ***Now you find the area of this side.***	Student calculates the area.			
Demonstrate measuring the length and width with whatever tool e.g., ruler, inch cubes) the student will be using. Calculate the area using whatever tool (e.g., multiplication table, calculator) the student will be using. Figure 1 provides a template for you to use. ***Now we have to calculate the area of the last side. Watch me. First I measure the length and put that number in the formula. Next I measure the width and put that number in the formula. Using the formula, the area of the last side is*** **(insert area in the formula; be sure to use the terminology of "square" units).** ***Now you find the area of the last side.***	Student calculates the area.			

Instructional Cue	*Student Expected Response*	*Version A Date:*	*Version B Date:*	*Version C Date:*
Demonstrate saying the number and square unit of measure as you read the script. Figure 1 provides a template for you to use. ***After we know the area of each side, we have to add them all together to find the surface area. We can use this formula: A + A + A + A + A + A = ___. So for the surface area of this figure, the formula looks like this:*** **(substitute the number of square units of the area of each side for each A in the formula).** ***When we add the areas of all the sides, we find the surface area for this figure is*** **(insert the sum of the areas into the formula using square units).** ***Now you do it.***	Student substitutes the area of each side for each A in the formula and adds them together, expressing the surface area in square units.			
Show the student the net as you read the script. Demonstrate how it looks just like the figure after you have folded it. Point to each part of the net as you show the side it relates to. ***We can also use a net to find the surface area of a figure. A net shows what the figure would look like if we flattened it out. This is a net of the figure we just worked with. If we fold the net, we get a figure just like the one we worked with. Here is the part that shows this side; here is the part that shows this side; here is the part that shows this side; here is the part that shows this side; here is the part that shows this side; and here is the part that shows this side. Show me the parts of the net that show each side.***	Student identifies the parts of the net that show each side.			

Instructional Cue	*Student Expected Response*	*Version A Date:*	*Version B Date:*	*Version C Date:*
Demonstrate measuring the length and width with whatever tool e.g., ruler, inch cubes) the student will be using. Calculate the area using whatever tool (e.g., multiplication table, calculator) the student will be using. Figure 1 provides a template for you to use. ***When we are figuring out the surface area of a figure using a net, the first thing we have to do is to find the area of each part of the net that shows a side. Remember that to find the area of a rectangle, we use the formula L x W = ___. Watch me. First I measure the length and put that number in the formula. Next I measure the width and put that number in the formula. Using the formula, the area of this part of the net is*** **(insert area in the formula; be sure to use the terminology of "square" units).** ***Now you find the area of this part of the net.***	Student calculates the area.			
Demonstrate measuring the length and width with whatever tool e.g., ruler, inch cubes) the student will be using. Calculate the area using whatever tool (e.g., multiplication table, calculator) the student will be using. Figure 1 provides a template for you to use. ***Now we have to calculate the area of another part of the net that shows a different side. Watch me. First I measure the length and put that number in the formula. Next I measure the width and put that number in the formula. Using the formula, the area of this part of the net is*** **(insert area in the formula; be sure to use the terminology of "square" units).** ***Now you find the area of this part of the net.***	Student calculates the area.			

Instructional Cue	*Student Expected Response*	*Version A Date:*	*Version B Date:*	*Version C Date:*
Demonstrate measuring the length and width with whatever tool e.g., ruler, inch cubes) the student will be using. Calculate the area using whatever tool (e.g., multiplication table, calculator) the student will be using. Figure 1 provides a template for you to use. ***Now we have to calculate the area of another part of the net that shows a different side. Watch me. First I measure the length and put that number in the formula. Next I measure the width and put that number in the formula. Using the formula, the area of this part of the net is*** **(insert area in the formula; be sure to use the terminology of "square" units).** ***Now you find the area of this part of the net.***	Student calculates the area.			
Demonstrate measuring the length and width with whatever tool e.g., ruler, inch cubes) the student will be using. Calculate the area using whatever tool (e.g., multiplication table, calculator) the student will be using. Figure 1 provides a template for you to use. ***Now we have to calculate the area of another part of the net that shows a different side. Watch me. First I measure the length and put that number in the formula. Next I measure the width and put that number in the formula. Using the formula, the area of this part of the net is*** **(insert area in the formula; be sure to use the terminology of "square" units).** ***Now you find the area of this part of the net.***	Student calculates the area.			

Instructional Cue	*Student Expected Response*	*Version A Date:*	*Version B Date:*	*Version C Date:*
Demonstrate measuring the length and width with whatever tool e.g., ruler, inch cubes) the student will be using. Calculate the area using whatever tool (e.g., multiplication table, calculator) the student will be using. Figure 1 provides a template for you to use. ***Now we have to calculate the area of another part of the net that shows a different side. Watch me. First I measure the length and put that number in the formula. Next I measure the width and put that number in the formula. Using the formula, the area of this part of the net is* (insert area in the formula; be sure to use the terminology of "square" units). *Now you find the area of this part of the net.***	Student calculates the area.			
Demonstrate measuring the length and width with whatever tool e.g., ruler, inch cubes) the student will be using. Calculate the area using whatever tool (e.g., multiplication table, calculator) the student will be using. Figure 1 provides a template for you to use. ***Now we have to calculate the area of last part of the net that shows a different side. Watch me. First I measure the length and put that number in the formula. Next I measure the width and put that number in the formula. Using the formula, the area of the last part of the net is* (insert area in the formula; be sure to use the terminology of "square" units). *Now you find the area of the last part of the net.***	Student calculates the area.			

Instructional Cue	*Student Expected Response*	*Version A Date:*	*Version B Date:*	*Version C Date:*
Demonstrate saying the number and square unit of measure as you read the script. Figure 1 provides a template for you to use. ***Just like when we used the figure, we have to add all the areas of each part of the net together to find the surface area. We can use this same formula: A + A + A + A + A + A = ___. So for the surface area of the net of this figure, the formula looks like this:*** **(substitute the number of square units of the area of each side for each A in the formula).** ***When we add the areas of all the parts of the net, we find the surface area for of the net of this figure is*** **(insert the sum of the areas into the formula using square units).** ***Now you do it.***	Student substitutes the area of each part of the net for each A in the formula and adds them together, expressing the surface area in square units.			

Transition Activity: Back to the UDL Lesson

To help the student develop an understanding of surface area and to work with the UDL unit, it might be helpful to provide scripted activity with data collection after the Introduction of Lesson 3 and again before the Lesson 3 Body. Have the student complete the activities in the Introduction and the Body using:

- appropriate systematic instruction as needed;
- communication system terminology or symbols;
- Additional Considerations for Emerging Readers and Emerging Communicators provided at the end of the lesson (e.g., providing labels for each face using symbol-based text)

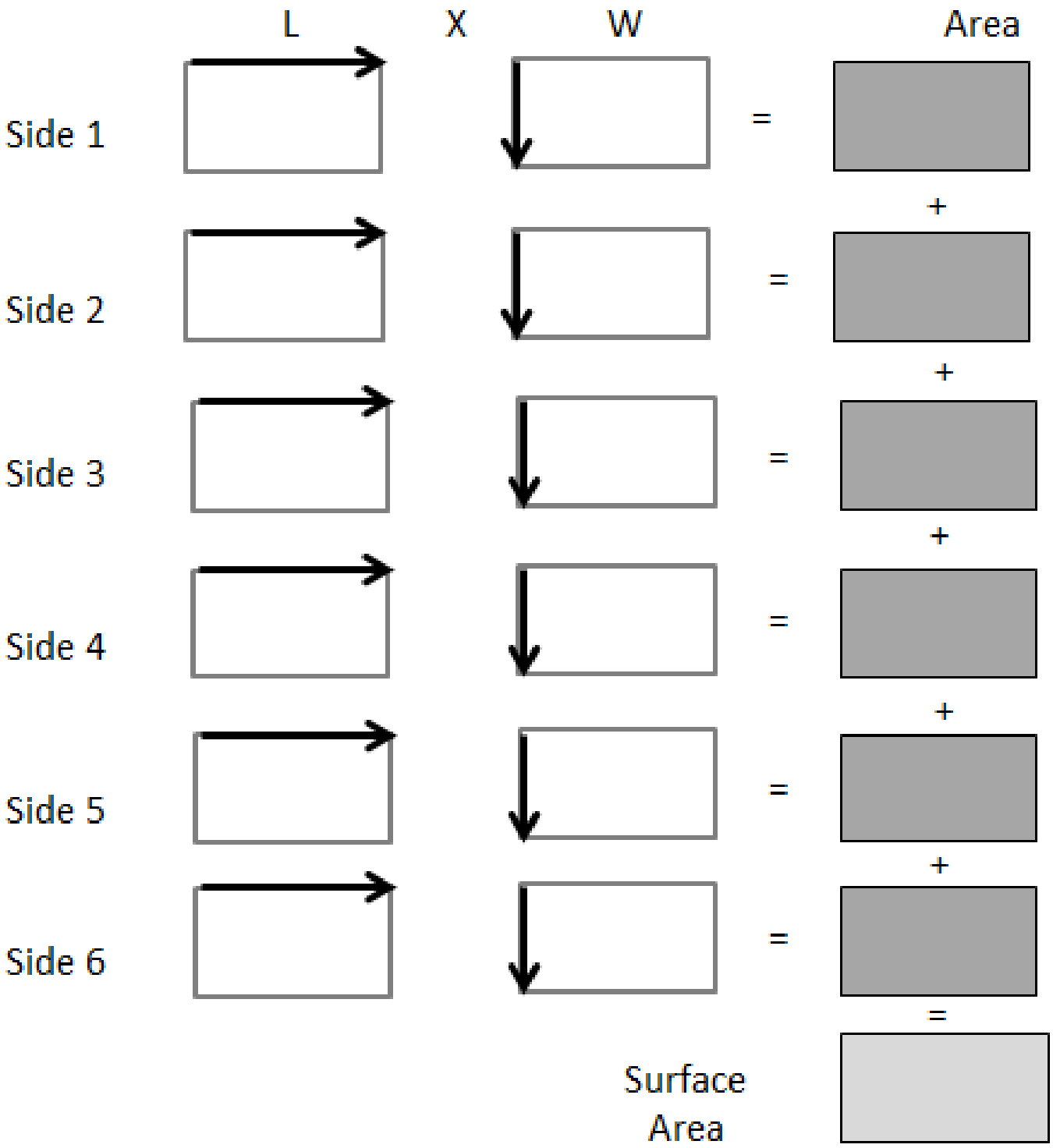

Figure 1 template for measuring surface area