Teacher Candidate: Bahara Baghkhanian   **Date:** March 27, 2018

THE UCI LESSON PLANNER
Part 1: Classroom Information

Grade: 4   **Content Area:** Mathematics

School: Harbor View Elementary School   **Mentor Teacher:** Irene Edler

Group Size: 26   **Lesson Length:** 60 minutes

Part 1: Planning for the Lesson

A: Standards

    i.   **Key Content Standard(s)**:

CCSS.MATH.CONTENT.4.MD.3 Apply the area formula for rectangles in mathematical problems.
CCSS.MATH.CONTENT.4.NBT.5 Multiply a 2-digit whole number by a 1-digit whole number using strategies based on place value and the properties of operations.
CCSS.MATH.CONTENT.4.NBT.5 Multiply two 2-digit whole numbers using strategies based on place value and the properties of operations.
CCSS.MATH.PRACTICE.4.MP.4 Model with mathematics

B. Objectives

    i.   **Learning Objective/Goal**: The students will (**DO __**) to (**LEARN ___**).
Students will use concrete manipulatives and measurements to generate the formula for determining the area of rectangles in order to learn how to apply the area formula for rectangles and explain their reasoning when solving various mathematical problems.

    ii.   **Language Objective** (transfer this from "Incorporating Academic Language"):
The students will explain how and why to apply the area formula for rectangles to solve various mathematical problems using the sentence frame, "The area of the rectangle is _____. I can explain this because _____."

C. Assessments:

    i.   Informal assessment strategies you will use during class (What informal assessment strategies will you use, what specific evidence will you see and/or hear and how will you note it?)

Assessment Strategy:
Monitor Student Work

Evidence of Student Learning:
Throughout this lesson, students are provided with opportunities to collaborate with classmates as they use manipulatives and measurements to make sense of the concept of area, eventually generating a formula in the process. As students work with peers, I will walk around the classroom to provide guidance, while also formatively assessing their progress toward discovering methods of determining the area. I will specifically look at how students physically create a 144 square inch figure, as well as how they create and draw models with equations when determining the area of a 10" x 18" rectangle. I will listen to the language they use as they reason through each learning task. Further, I will be monitoring students as they work on the "Measuring Area" Activity Sheet to see whether they can properly measure a chromebook (with proper length and width) draw a model, label its dimensions, and apply the formula to determine the area of a rectangle.

Assessment Strategy:
Student Share-Outs Within Whole Group Setting

Evidence of Student Learning:
Volunteers will present their thinking aloud throughout this lesson. In particular, I will formatively assess students as they make progress toward the learning objective by listening to them explain how and why they would apply the area formula for rectangles to solve various mathematical problems using the sentence frame, "The area of the rectangle is ____. I can explain this because _____." I will be looking for the use of key vocabulary, including area, rectangle, length, width, and dimension.

      ii.   Written assessment you will use to determine, **for each** individual student, to what extent they have met your learning objectives. (What evidence will you collect?)
I will use an Exit Slip to determine the extent to which each individual student has met the learning objective of the lesson. Throughout the lesson, students will have used physical manipulatives and measurements to generate the formula for determining the area of rectangles. With this understanding, the children will have to explain how and why they apply the area formula for a rectangle to solve a specific problem. They will first be presented with the dimensions of a poster and will have to sketch and label its parts. They will then have to apply the formula in order to reach a solution, writing out each step that was taken to solve for the area. They will then use words to explained how they reasoned through the problem to determine the area.

D. Lesson Resources/Materials):
Vocabulary Resource Cards
 864 Square Inch Tiles
12" x 12" Red Paper

26 Rulers
10" x 18" Pieces of Blue Construction Paper
26 Student Math Journals
26 Chromebooks
Expo Markers
Whiteboard
Document Camera
26 Measuring Area Activity Sheets
26 Measuring Area Exit Slips

Part 2: Instructional Sequence - Engaging Students in the Learning Process
Introduction (5 min.): Describe how you will 1) make connections to prior knowledge, tap into their experiences and interests or use a "hook", **AND** 2) let students know what the objective of the lesson is.
 -Post the word resource card for *Area* on the board and ask students to pair with an elbow partner to discuss what they know about the term.
- After 1-2 minutes, encourage volunteers to share their thoughts with the class.
-As the discussion unfolds, ensure that the following concepts are touched upon (scaffold students if these ideas do not arise through their input):
   - Area is a measure of how much surface something takes up.
   - Area is measured in square units such as square inches, square feet, or square miles.
   - Area is the total number of square units needed to cover a two-dimensional surface.
-Chorally read the learning objective of the lesson aloud with the students.

Body of the Lesson (45-50 minutes): Describe step-by-step what the teacher **and** the students will be doing during the lesson.
- Hold up a tile and ask students to share methods of determining its area. Fasten it on the whiteboard and work with students to label its dimensions and area (Support: If students struggle, ask a volunteer to come up and measure the dimensions of the tile. Work with the class to understand that the tile is exactly 1 square inch.
-Provide sets of tiles to groups of four/five students and ask them to work together to build a square with an area of exactly 144 square inches.
- Circulate the room and listen to student thinking, providing guidance.
Support: Communicate with IEP student to check for understanding. Closely monitor the child.
-After 4-5 minutes, ask students share their strategies aloud by prompting them with the following questions:
      -What did you notice when you were determining the area?
      -What strategy did you use to build a square with an area of exactly 144 square inches? Please explain your reasoning.
      - What other strategies can be applied to build a square with an area of exactly 144 square inches?

-Ask each group to measure the dimensions of the square they have built with the inch side of their rulers. Encourage them to share what they know about the square now by prompting them with the question:

   - How do measurements of the dimensions relate to the area? Explain your reasoning.

- Show students a 12" x 12" square of red construction paper and have a volunteer compare it to the tile square at his or her table for the class to see. Once it has been confirmed that the two are the same, tape the construction paper to the whiteboard.

- Encourage students to provide input to label the dimensions and the area. Describe that because it is 12" or 1' on each side, it is called a square foot.

-Provide each group with a 10" x 18" piece of blue construction paper. Ask students to work together to find the area of the rectangle, using their tiles and rulers to support them. Tell them to use as many strategies as they can to find the area of the rectangle.

- Instruct students to record their computations and explanations in their journals.

Support: Repeat directions to student with IEP as well as Struggling Readers.

- After a few minutes, prompt students to share their thoughts aloud, explaining how they reasoned through the problem to find the area of the rectangle by using the following sentence frame displayed on the whiteboard:

   -"The area of the rectangle is _____. I can explain this because _____."

-Record student strategies on the whiteboard.

- Post the word resource card for *Dimension* on the whiteboard. Tell students that to find the area of a rectangle, we can use measurements of the length and width dimensions. We can combine those numbers in a manner that allows us to determine the area. Ask students:

   - "What am I referring to when I say that I can measure the length and width and combine the numbers to find the area?"

   -"How does this work and why does it work?"

- After prompting students with questions, work with them to compose a formula for the area of a rectangle: area= length x width or A=lw.

- Provide each student with a "Measuring Area" Activity Sheet that involves identifying the area of each of their chromebooks.

- Read instructions with students and encourage them to work with a peer to solve the problem.

Support: Repeat instructions for student with IEP and check for understanding. Repeat instructions and provide necessary clarification to Struggling Readers.

- Walk around the classroom to monitor and provide guidance to groups as well as individuals.

Closure (5 minutes): Describe how you will prompt the students to summarize the lesson and restate the learning objective.

- Ask students to explain how they applied the area formula for rectangles to determine the area of their chromebooks as well as how they reasoned through the problem with the support of the following sentence frame:

   -"The area of the chromebook (rectangle) is _____. I can explain this because _____."

- Revisit the learning objective of the lesson and ask students:

   -What is area? What did we learn about finding the area of a rectangle? What does the formula for area mean and how can it it be applied to solve various mathematical problems?

-Provide each child with an exit ticket that will be completed as an individual formative assessment. Leave the sentence frame written on the whiteboard in order to support students.
- Repeat directions for student with IEP as well as struggling readers. Monitor these students closely and provide IEP student with additional time to complete the Exit Slip.

<u>**Part 3: Incorporating Academic Language**</u>
1.   Describe the rich learning task(s) related to the content learning objective.
 The rich learning tasks related to the content learning objective involve the use of physical square inch unit tiles and rulers. These manipulatives provide students with an opportunity to build their conceptual understanding of area, while also making sense of how it can be determined. The manipulatives make the learning task rich because they allow for learners of different strengths and skill levels to learn from the activity as progress toward generating a formula for determining the area of a rectangle takes place. Further, the sentence frame used in the lesson provides students with support as they communicate their mathematical reasoning in the form of an explanation. This explanation directly relates to how and why the area formula of a rectangle can be applied when solving various mathematical problems.

2.   **Language Function:** How will students be communicating in relation to the content in the learning task(s)? Identify the specific **function** (purpose or genre) you want to <u>systematically</u> address in your lesson plan that will scaffold students to stronger disciplinary discourse. The language function will always be a verb. Some examples are: describe, identify, explain, justify, analyze, construct, compare, or argue.

 Explain

3.   **Language Demands**: Looking at the specific function (purpose or genre) your students will be using, what are the language demands that you will systematically address in this lesson?

Vocabulary:
Key to this lesson:
 Area, Rectangle, Dimension, Units, Length, Width

Syntax[1]:
 "The area of the rectangle is _____. I can explain this because _____."

Discourse[2]:
 N/A
4.   **Language Objective:** What is/are the **language objective(s)** for your lesson
 The students will explain how and why to apply the area formula for rectangles to solve various mathematical problems using the sentence frame, "The area of the rectangle is _____. I can explain this because _____."

5. **Language Support:** What **instructional strategies** will you use during your lesson to teach the specific language skill and provide support and opportunities for guided and independent practice?

Instruction	Guided Practice	Independent Practice
During instruction, students will be guided through intentional questioning strategies that will prompt and support them in generating a formula for the area of a rectangle. In addition, vocabulary image cards will be displayed on the whiteboard for the children to see.	Throughout the guided practice segment of the lesson, students will be provided with a sentence frame to support their language as they begin explaining how they applied the area formula for a rectangle to solve various problems.	During independent practice, the sentence frame from the guided practice portion of the lesson will remain displayed on the whiteboard. This will support students as they generate explanations for how and why they applied the area formula for a rectangle to solve the problem presented on the exit slip.

Name   Date

Measuring Area

Find the area of the item listed below.	**Dimensions** Measure to the nearest inch and show your units in inches.	**Area** Show your work by drawing a sketch with labeled dimensions (length and width). Be sure to use the correct units as you solve for the area. Area= Length x Width
Ex A piece of blue construction paper	Length = 18" (inches) Width = 10" (inches)	18" x 10" = 180 square inches
Chromebook Challenge: Student Desk		

Name   Date

Measuring Area Exit Slip

Laura wants to take her rectangular presentation poster home to show her family. She wants to calculate the area of the poster to see whether she can hang it on the wall in her bedroom. The rectangular poster has a length of 20 inches and a width of 14 inches. What is the total area of Laura's poster in square inches?

1. First, sketch an image of Laura's poster and properly label its dimensions with numbers.
2. Next, apply the area formula to solve for the area of Laura's poster. (Area = Length x Width). Be sure to write out each step that you took to solve for the area.
3. Finally, use words to **explain** how you reasoned through the problem to determine the area.
    a. Explain what your solution means and how you know it is correct.