

## Bachelor of Education (Elementary) & Bachelor of Education (Secondary) STEM Lesson Plan

Thurs April 24,

Lesson Title: Mathematics – Area      Lesson # 6      Date: 2025  
*Finding the Area of Polygons Using*  
 Name: grids      Subject: Mathematics      Grade(s): 4/5

**Rationale:**

This lesson is important because it introduces students to finding the area of simple shapes such as rectangles and squares so that it can be built upon later to more complex shapes. This knowledge is taken forwards into the students’ futures to build upon and is related to real-world scenarios in which this skill is needed to develop special reasoning, problem-solving skills, and real-world applications.

**Core Competencies:**

Communication	Thinking	Personal & Social
<ul style="list-style-type: none"> <li>• <b>Collaborating - Working Collectively:</b> Students combine their efforts with those of others to effectively accomplish learning and tasks. As members of a group, they appreciate interdependence and cooperation, commit to needed roles and responsibilities, and are conscientious about contributing. They also negotiate respectfully and follow through on plans, strategies, and actions as they share resources, time, and spaces for collaborative projects.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Critical thinking &amp; Reflective Thinking - Questioning &amp; Investigating:</b> Students learn to engage in inquiry when they identify and investigate questions, challenges, key issues, or problematic situations in their studies, lives, and communities and in the media. They develop and refine questions; create and carry out plans; gather, interpret, and synthesize information and evidence; and reflect to draw reasoned conclusions. Critical thinking activities may focus on one part of the process, such as questioning, and reach a simple conclusion, while others may involve more complex inquiry requiring extensive thought and reflection.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Positive personal and cultural identity - Identifying personal strengths and abilities:</b> Students acknowledge their strengths and abilities, and they intentionally consider these as assets, helping them in all aspects of their lives. Students understand that they are unique and are a part of larger, and often multiple, communities. They explain how they are using their strengths and abilities in their families, their relationships, and their communities.</li> <li>• <b>Personal awareness and responsibility - Self-advocating:</b> Students who are personally aware and responsible have a sense of self-worth and a growing confidence in a variety of situations. They value themselves, their ideas, and their accomplishments. They are able to express their needs and seek help when needed, find purpose and motivation, act on decisions, and advocate for themselves.</li> </ul>

		<ul style="list-style-type: none"> <li>• <b>Social Awareness &amp; Responsibility - Building Relationships:</b> Students build and maintain diverse, positive peer and intergenerational relationships. They are aware and respectful of others' needs and feelings and share their own in appropriate ways. They adjust their words and actions to care for their relationships.</li> </ul>
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**Big Ideas (Understand)**

<ul style="list-style-type: none"> <li>• Closed shapes have area and perimeter that can be described, measured, and compared.</li> <li>• Polygons are closed shapes with similar attributes that can be described, measured, and compared.</li> </ul>
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**Learning Standards**

(DO)	(KNOW)
<p><b>Learning Standards - Curricular Competencies</b></p> <ul style="list-style-type: none"> <li>• Explain and justify mathematical ideas and decisions</li> <li>• Area measurement of squares and rectangles</li> <li>• Develop and use multiple strategies to engage in problem solving</li> <li>• Relationships between area and perimeter</li> <li>• Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving</li> <li>• Perimeter of regular and irregular shapes</li> <li>• Use reasoning to explore and make connections</li> <li>• Use mathematical vocabulary and language to contribute to mathematical discussions</li> <li>• Regular and irregular polygons</li> <li>• Communicate mathematical thinking in many ways</li> <li>• Reflect on mathematical thinking</li> </ul> <p><b>ELA:</b> Create &amp; Communicate:</p> <ul style="list-style-type: none"> <li>• Use writing and design processes to plan, develop, and create texts for a variety of purposes and audiences</li> </ul> <p>Comprehend &amp; Connect:</p> <ul style="list-style-type: none"> <li>• Access information and ideas from a variety of sources and from prior knowledge to build understanding</li> </ul>	<p><b>Learning Standards - Content</b></p> <ul style="list-style-type: none"> <li>• Relationships between area and perimeter</li> <li>• Regular and irregular polygons</li> </ul>

<b>Science:</b> Evaluating: <ul style="list-style-type: none"> <li>Identify possible sources of error</li> </ul> Applying & Innovating: <ul style="list-style-type: none"> <li>Transfer and apply learning to new situations</li> </ul>	
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### Instructional Objectives & Assessment

Instructional Objectives (students will be able to...)	Assessment
<ul style="list-style-type: none"> <li>Calculate the area of regular &amp; irregular shapes (polygons)</li> <li>Understand &amp; explain what the “area” of a rectangle and square is</li> <li>Calculate the area of a triangle using the formula <math>\text{Area} = \text{Length} * \text{Width}</math></li> <li>Solve basic real-world problems involving the area of rectangles &amp; squares</li> </ul>	<ul style="list-style-type: none"> <li>Observation of students participating in the activities</li> <li>Observation of the students applying the area of a triangle formula correctly <math>\text{Area} = \text{Length} * \text{Width}</math> or counting units</li> <li>Worksheets to count/calculate the area of rectangles &amp; squares</li> <li>Two stars and a Wish assessment form for those that can read &amp; write – Tell me two things that you have learned and tell me one thing that you are still wondering about that I can address in a later class</li> </ul>

### Prerequisite Concepts and Skills:

<ul style="list-style-type: none"> <li>Ability to count</li> <li>Basic knowledge of what rectangles and squares are</li> <li>Understanding that rectangles and squares have 4 sides</li> <li>Willingness to learn new things</li> <li>Recording data on paper</li> </ul>
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### Indigenous Connections/ First Peoples Principles of Learning:

<p><b>Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place):</b> Students will be measuring and counting, which can be a trial-and-error endeavor. This allows students the opportunity to reflect and predict using their reasoning skills and natural problem-solving abilities.</p> <p><b>Learning involves patience and time:</b> Patience and time are intertwined with learning new things, and that’s exemplified in mathematics. Giving students appropriate time to learn and expand their thinking is important for retaining information in a calm and supportive fashion.</p> <p><b>Learning involves recognizing the consequences of one’s actions:</b> Mathematics is an objective course that teaches students this Indigenous principle – if they perform a certain action, like adding two digits, there is a direct consequence, and calculations will affect it positively or negatively in terms of accuracy.</p>
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### Universal Design for Learning (UDL):

<ul style="list-style-type: none"> <li>Allow all students to use a calculator to find the area of triangles using <b><math>\text{Area} = \text{Length} * \text{Width}</math></b></li> <li>Use multiple means of representation for what area is – written, verbal, and pictures</li> <li>Use examples that are large enough to be easily seen so students are not struggling to count the squares.</li> <li>Use of clear directions on the worksheets</li> <li>Scaffolded worksheets to find the area of squares &amp; rectangles starting with grids (units) to count and build to numbers as lengths &amp; widths</li> </ul>
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- Multiplication sheets will be available for all students to use (calculators if they really need them)
- Worksheets are laid out so that they are clear and easy to see what students are to complete
- Starting from the beginning of what area is and how we calculate it both in grid (unit) form & by using the formula  $\text{Area} = \text{Length} \times \text{Width}$
- Playing a fun game with dice to engage the students thinking about area as they draw it
- Using the projector to work through worksheets together so students can see how to do it before they attempt it themselves

### Differentiate Instruction (DI):

- Scaffolded area calculation worksheets for those that struggle with reading and writing
- Limited data on some worksheets so that it reduces students feeling overwhelmed

### Materials and Resources

- Laptop for presentation
- Projector
- Whiteboard
- Whiteboard markers & eraser
- Worksheets
- Pencils & erasers
- Several sets of dice
- Graph paper
- Pencil crayons
- Two stars & a wish template
- Popsicle sticks with names to draw from for answers

Worksheets: <https://www.k5learning.com/free-math-worksheets/third-grade-3/geometry/area-rectangular-grid>  
<https://www.k5learning.com/free-math-worksheets/fourth-grade-4/geometry/area-perimeter-grid>  
<https://www.superteacherworksheets.com/area-counting-square-units.html>  
 Games: <https://yourfuntasticworld.wordpress.com/2019/03/07/area-dice-game/>

### Lesson Activities:

Teacher Activities	Student Activities	Time
<b>Introduction (anticipatory set – "HOOK"):</b> <ul style="list-style-type: none"> <li>• Start with a real-world scenario: "If I was super hungry, which pizza would I rather get? How would I decide?"</li> </ul>	<ul style="list-style-type: none"> <li>• Students will offer answers by raising their hands</li> </ul>	5 minutes
<b>Body:</b> <b>Development:</b> <b>Activity 1: Finding the area of a given rectangle</b> <ul style="list-style-type: none"> <li>• Ask students to put their name on their paper</li> <li>• Ask students to draw a rectangle on their <b>grid paper</b> measuring 5 cm x 3 cm</li> <li>• Draw it on the board with grid lines</li> </ul>	<ul style="list-style-type: none"> <li>• Students will draw a rectangle with dimensions of 5 cm x 3 cm</li> <li>• Students will raise their hands if they want to answer</li> </ul>	5 minutes

<ul style="list-style-type: none"> <li>• How would we figure out what the area of the rectangle is?</li> <li>• Does anyone know how we can do that calculation quicker by using multiplication?</li> </ul> <p><b>Activity 2: Finding the area of a square</b></p> <ul style="list-style-type: none"> <li>• Have students draw a square with the dimensions of 5 x 5</li> <li>• Draw the square on the board with the grid lines</li> <li>• How did you know how to draw that?</li> <li>• What is the area of the square? (25)</li> <li>• How did you find the answer? Did you count the units in the square? Did you use multiplication?</li> </ul> <p><b>Activity 3: Finding the area of a polygon (irregular shape)</b></p> <ul style="list-style-type: none"> <li>• Have students draw a polygon that has an area of 12 units. It can be a square, a rectangle, or a polygon as long as it is a closed shape with the area of 12 units</li> <li>• "How did you do that?"</li> </ul> <p><b>Activity 4: Worksheets</b></p> <ul style="list-style-type: none"> <li>• Hand out the basic worksheets of various polygons</li> <li>• Get students to put their names on their paper</li> <li>• Work through a few questions with the class so the students know what they are supposed to do</li> <li>• After they have asked questions and everyone seems good, get them to continue with the worksheets</li> </ul> <p><b>Area Dice Game:</b></p> <ul style="list-style-type: none"> <li>• Put students into groups of 2</li> <li>• Hand out graph paper to each group (1 per group), 2 different coloured pencil crayons, &amp; a set of dice</li> <li>• Explain the game <ul style="list-style-type: none"> <li>○ Each player will pick a coloured pencil crayon</li> <li>○ Players take turns rolling the dice and using the numbers that they roll, making a rectangle or square with those dimensions &amp; writing the area in the shape</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Students will draw a square that is 5 x 5 on their graph paper</li> <li>• Students will offer answers by raising their hands</li> <li>• Students will draw a polygon that has an area of 12 units on their graph paper</li> <li>• Students will offer answers by raising their hands</li> </ul>	<p>5 minutes</p> <p>5 minutes</p> <p>15 minutes</p> <p>15 minutes</p>
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<ul style="list-style-type: none"> <li>○ Students will colour that shape in fully with their special colour</li> <li>○ The next student rolls the dice and does the same from their side</li> <li>○ The object of the game is to have the largest area covered/ the most squares with their colour</li> <li>○ Game ends when the players run out of room to draw another area on their side</li> <li>○ Get Stephen to help run through the game by rolling the dice, drawing in the area, etc. so students can see how it is played</li> <li>○ Let students know how much time they have to play before cleanup</li> </ul>		
<p><b>Closure:</b> <i>Two stars and a Wish:</i></p> <ul style="list-style-type: none"> <li>● Hand out the Two stars and a wish paper</li> <li>● Ask students to add their names to it</li> <li>● Ask students to write 2 things that they learned and 1 thing that they still have a question about</li> <li>● Get students to hand in all their papers (worksheets &amp; 2 stars and a wish)</li> <li>● Ask students to clean up their area</li> </ul>	<ul style="list-style-type: none"> <li>● Students will add their name to their paper</li> <li>● Students will fill in the 2 stars and a wish</li> <li>● Students will hand in all their worksheets and papers</li> <li>● Students will hand in all their paperwork from today</li> <li>● Students will clean up their areas and get ready for snack at 10:10</li> </ul>	<p>10 minutes</p>

**Organizational Strategies:**

<ul style="list-style-type: none"> <li>● Students will be fresh in the morning so sitting should be easier for them</li> <li>● When students want to add to the class discussion or ask questions, they will raise their hand and wait to be called on by the teacher</li> <li>● Worksheets will not be distributed until they need them</li> <li>● Students that are talking without raising their hand will be asked to raise their hand if they want to contribute</li> <li>● Students that are talking after reminders will be separated</li> <li>● The teacher will remain silent until the class chatter stops</li> <li>● The teacher will use the class popsicle sticks to choose students to answer and not pick the students that have their hand up (Amy wants us to do this because the same students are always answering questions)</li> </ul>
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**Proactive, Positive Classroom Learning Environment Strategies:**

<ul style="list-style-type: none"> <li>● There will be plenty of practice work done together for students to get used to doing area calculations before attempting it on their own</li> <li>● Scaffolded worksheets will be provided to accommodate all learners</li> </ul>
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- The teacher will make behaviour expectations clear – sit quietly and listen attentively without distracting other students, only speak if the teacher calls on you – by stating them before and during the lesson
- The teacher will verbally acknowledge and thank students who are on task and will verbally address the students who continue to distract others
- The teacher will, if necessary, separate students who continue to distract each other

#### **Extensions:**

More progressive worksheets could be added for students to do as well as adding in the use of the area formula rather than just using a grid system. The levels of those questions could be increased as well if students need more of a challenge. Lower-level worksheets could also be used to decrease the level of complexity.

**Early finishers** or those that need more of a challenge will have extra worksheets provided that are more advanced.

#### **Reflections (if necessary, continue on separate sheet):**

If I did this lesson again, I would concentrate more on the game rather than trying to get through the worksheets. Our class is a challenge for behaviour and it takes 50-75% of the time to get attention and hold it. The game went over well but they did not have enough time for it.