

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

Wed April 23,

Lesson Title: Mathematics – Area      Lesson # 5      Date: 2025  
 Name: *The Area of Squares & Rectangles*      Subject: Mathematics      Grade(s): 4/5

**Rationale:**

This lesson is important because it introduces students to finding the area of simple shapes such as squares & rectangles 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 Unit Plan 2018 (updated Jan 19, 2018) Page 1 to express their needs and seek help when needed, find purpose and motivation, act on</li> </ul>

		<p>decisions, and advocate for themselves.</p> <ul style="list-style-type: none"> <li>• <b>Social Awareness &amp; Responsibility - Building Relationships:</b></li> </ul> <p>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.</p>
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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> <p>Communicating and representing:</p> <ul style="list-style-type: none"> <li>• Explain and justify mathematical ideas and decisions</li> <li>• Use mathematical vocabulary and language to contribute to mathematical discussions</li> <li>• Communicate mathematical thinking in many ways</li> <li>•</li> </ul> <p>Understanding and solving:</p> <ul style="list-style-type: none"> <li>• Develop and use multiple strategies to engage in problem solving</li> <li>• Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving</li> </ul> <p>Reasoning and explaining:</p> <ul style="list-style-type: none"> <li>• Use reasoning to explore and make connections</li> </ul> <p>Connecting and reflecting</p> <ul style="list-style-type: none"> <li>• Reflect on mathematical thinking</li> </ul> <p><b>ELA:</b></p> <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>Science:</b></p> <p>Planning &amp; Conducting:</p>	<p><b>Learning Standards - Content</b></p> <ul style="list-style-type: none"> <li>• Area measurement of squares and rectangles</li> <li>• Relationships between area and perimeter</li> </ul>

<ul style="list-style-type: none"> <li>• With support, plan appropriate investigations to answer their questions or solve problems they have identified</li> <li>• Choose appropriate data to collect to answer their questions</li> </ul> <p>Evaluating:</p> <ul style="list-style-type: none"> <li>• Identify possible sources of error</li> </ul> <p>Applying &amp; Innovating:</p> <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 perimeter of regular &amp; irregular shapes (polygons)</li> <li>• Understand &amp; explain what “area” is of a rectangle &amp; square</li> <li>• Calculate the area of a rectangle &amp; square using the formula Area = Length * Height</li> <li>• Find &amp; calculate the area of squares &amp; rectangles with missing measurements</li> <li>• Use grid paper to model &amp; count square units to determine the area</li> <li>• Solve basic real-world problems involving the area of rectangles &amp; squares</li> </ul>	<ul style="list-style-type: none"> <li>• Class participation in discussions</li> <li>• Asking &amp; answering questions during instruction</li> <li>• Scaffolded worksheet completion</li> <li>• Exit ticket</li> </ul>

### Prerequisite Concepts and Skills:

<ul style="list-style-type: none"> <li>• Knowledge of what a square and a rectangle are &amp; how their measurements work</li> <li>• Understanding that squares have 4 equal sides and rectangles have equal lengths and equal widths</li> <li>• Willingness to learn new things</li> <li>• Ability to add and multiply (calculator accessible)</li> <li>• Counting and measuring with simple tools and graph paper</li> <li>• Recording data on paper</li> <li>• Ability to use standard units of measurement</li> </ul>
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### Indigenous Connections/ First Peoples Principles of Learning:

<p><b><i>Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place):</i></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><i>Learning involves patience and time:</i></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><i>Learning involves recognizing the consequences of one’s actions:</i></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):

- Allow all students to use a calculator to find the area of rectangles & squares using  $\text{Area} = \text{Length} * \text{Width}$
- Use multiple means of representation for what area is – written, verbal, and pictures
- Use grid paper that is large enough to be easily seen so students are not struggling to count the squares.
- Use of clear directions on the worksheets
- Scaffolded worksheets that start with a perimeter review and then build into the area of squares and rectangles at various complexities
- Calculators will be available for those that need or want them
- Worksheets are laid out so that they are clear and easy to see what students are to complete

### Differentiate Instruction (DI):

- Multi-leveled worksheets from simple to more advanced
- Refresher on how to calculate the perimeter of polygons, particularly squares & rectangles for this lesson
- Clear and simple instruction on how to calculate area giving plenty of time for questions and help
- Separate students that are not working well together
- Use real-world structures to explain how to calculate the area (i.e. playgrounds, fields, the classroom, etc.)

### Materials and Resources

- Whiteboard
- Whiteboard markers & erasers
- Screen
- Projector
- Laptop
- Worksheets (photocopy & double-side)
- YouTube video link
- Squares for “hook” such as tiles (cut up grid paper)
- Grid paper (cut in half for the exit ticket)
- Pencils & erasers
- Rulers
- Calculators
- Multiplication table sheets

### Lesson Activities:

Teacher Activities	Student Activities	Time
Introduction (anticipatory set – “HOOK”): <b>Activity 1:</b> <ul style="list-style-type: none"> <li>• Challenge students to build something out of their square unit manipulatives. Get them to count how many squares they used.</li> <li>• Why do they think this is important to know how many squares they used if they were building a park? A garden?</li> </ul>	<ul style="list-style-type: none"> <li>• Students will build something out of their “squares” (grid paper pieces)</li> </ul>	5 minutes

<p>What is this space called inside the perimeter?</p> <ul style="list-style-type: none"> <li>• Introduce area as what we're doing for this lesson &amp; give the students an overview of the lesson.</li> </ul>	<ul style="list-style-type: none"> <li>• Students will ask any questions that they have by putting up their hand</li> </ul>	
<p><b>Teacher Explanation:</b></p> <ul style="list-style-type: none"> <li>• Introduce how to find the area of a square</li> <li>• Explain how we measure area in square units</li> <li>• Introduce how to find the area of a rectangle</li> <li>• Show half of the YouTube video (it also gives the area of a triangle so stop there &amp; use it for the next class): <a href="https://www.youtube.com/watch?v=xCdxURXMdFY">https://www.youtube.com/watch?v=xCdxURXMdFY</a></li> <li>• Take questions that students may have</li> </ul> <p><b>Guided Practice with Grid Paper:</b>  <b>Activity 2 "We do" - Counting Squares on Grid Paper</b></p> <ul style="list-style-type: none"> <li>• Hand out the grid paper to students</li> <li>• Remind students to put their name on their paper</li> <li>• Demonstrate how to draw a rectangle on a grid</li> <li>• On their grid paper, ask students to draw a 4 x 3 rectangle using the squares on their grid paper</li> <li>• Ask students to count how many squares are in their area (should be 12)</li> <li>• Show students how to calculate the area using the formula Area = Length x Width</li> </ul> <p><b>Hands-On Grid Paper Practice:</b>  <b>Activity 3 "We do" – Grid Paper Practice</b></p> <ul style="list-style-type: none"> <li>• Ask students to draw different squares &amp; rectangles on their grid paper with specific dimensions (i.e. 5 x 2, 6 x 4)</li> <li>• Have the students count the number of squares for each of their shapes</li> <li>• Have students use the formula (Area = Length * Width) to see if their numbers are the same as what they counted</li> </ul> <p><b>Independent Practice:</b>  <b>Activity 4 "They do" - Find the Area of Given Shapes on the Worksheets</b></p>	<ul style="list-style-type: none"> <li>• Students will ask questions as they have them by raising their hand</li> <li>• Students will watch the video</li> <li>• Students will ask questions as they have them by raising their hand</li> <li>• Students will put their name on their papers</li> <li>• Students will draw a 4 x 3 rectangle on their grid paper</li> <li>• Students will calculate the area of their rectangle using the formula <math>A = L \times W</math></li> <li>• Students will work on drawing the shapes as directed</li> </ul>	<p>10 minutes</p> <p>15 minutes</p> <p>20 minutes</p>

<ul style="list-style-type: none"> <li>• Hand out the 1<sup>st</sup> worksheet for finding the area of given rectangles &amp; squares</li> <li>• Remind students to write their names on their worksheets</li> <li>• Ask students to complete their worksheets by finding the area of squares &amp; rectangles</li> <li>• There are 2 more worksheets if students finish the 1<sup>st</sup> one</li> </ul>	<ul style="list-style-type: none"> <li>• Students will write their names on their papers</li> <li>• Students will work on their worksheets</li> </ul>	
<p><b>Closure:</b>  <b>Wrap-up discussion and Reflection:</b></p> <ul style="list-style-type: none"> <li>• Discuss how students thought that by starting with grid paper, helped them</li> <li>• Ask if students have any questions</li> <li>• Review the Area formula for squares &amp; rectangles</li> </ul> <p><b>Exit ticket</b></p> <ul style="list-style-type: none"> <li>• Give each student an exit ticket handout with a grid on it</li> <li>• Remind students to add their name to their paper <ul style="list-style-type: none"> <li>◦ Ask students to <i>draw a square or rectangle and find the area of it</i></li> </ul> </li> </ul> <p><b>Clean-up Time:</b></p> <ul style="list-style-type: none"> <li>• Ask students to clean up their area</li> </ul>	<ul style="list-style-type: none"> <li>• Students will put up their hand if they want to talk</li> <li>• Students will ask any questions if they have them by putting up their hand</li> <li>• Students will add their name to their exit ticket</li> <li>• Students will follow instructions and complete their exit tickets</li> <li>• Students will hand in their papers and clean up their area</li> </ul>	10 minutes

**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 after the instruction when 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> </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> <li>• 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</li> <li>• The teacher will verbally acknowledge and thank students who are on task and will verbally address the students who continue to distract others</li> <li>• The teacher will, if necessary, separate students who continue to distract each other</li> </ul>
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### References:

- Video for instruction: <https://www.youtube.com/watch?v=xCdxURXMdFY>
- Worksheet templates: <https://www.teacherspayteachers.com/Product/Area-Task-Cards-Free-3430518>  
<https://www.k5learning.com/worksheets/math/grade-5-geometry-rectangles-area-perimeter-metric-a.pdf>  
<https://www.k5learning.com/worksheets/math/grade-5-geometry-rectangles-area-perimeter-metric-c.pdf>  
<https://www.k5learning.com/worksheets/math/grade-5-geometry-rectangular-shapes-area-perimeter-metric-b.pdf>  
<https://www.teacherspayteachers.com/Product/Area-Task-Cards-Free-3430518>

### Extensions:

*Early finishers or those that need a challenge* will have extra worksheets provided that are more advanced. If they complete those, there are word searches & comic strips to do, or they can read silently if they choose.

More worksheets & calculations for rectangles & squares could be added for students to do. 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.

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

The hook where I had cut out random squares & rectangles from graph paper to use as manipulators worked really well. It gave students a way to physically touch shapes and make other shapes with to find the total area. Scaffolded worksheets work well with this class as there is a huge range of abilities in it from very basic to grade level. Behaviour for our class is always an issue and it takes a huge amount of time to gain their attention and keep it so instruction can happen.