THOMPSON RIVERS UNIVERSITY | Education & Social Work

Bachelor of Education (Elementary) Unit Plan Template

Unit Title:	Introduction to Geometry	Number of Lessons	4	Time (in weeks):	1
Name:	Kassidy Porlier	Subject(s):	Math	Grade(s):	6

Rationale

This unit is important because geometry helps students make sense of the shapes and structures they see every day. Whether it is noticing the angles in a sign or the symmetry in a building, this kind of math shows up everywhere and understanding it gives students a way to talk about and explore the world around them.

It also gives students a chance to build confidence with tools like rulers and protractors and to practise logical thinking and problem solving in fun, hands-on ways. The unit is designed to be active, approachable, and creative so that every student can get involved and see themselves as capable math thinkers.

Overview:

This unit introduces students to key geometry concepts like angle measurement, triangle and polygon classification, congruence, and angle sums in shapes. Through a mix of hands-on activities, collaborative problem-solving, and real-world applications, students will explore how to use tools like rulers and protractors to investigate and describe shapes.

Each lesson builds on the last, starting with estimating and measuring angles, then moving into how those angles work together in different shapes. By the end of the unit, students will be able to accurately classify shapes, identify congruent figures, and solve for missing angles using what they've learned. Activities like the Polygon Puzzle and Triangle Detective mystery keep things engaging and help students connect math to the world around them.

CORE COMPETENCIES

Communication	Thinking	Personal & Social
Collaborating Students work together to classify shapes, compare measurements, and solve problems. Communicating Students explain their reasoning, share their ideas clearly in group discussions, and justify their answers in written and verbal form.	Creative Thinking Students explore different ways to sort, classify, and represent polygons and triangles based on their properties. Critical and Reflective Thinking Students reflect on their measurement strategies and check their classifications for accuracy, making adjustments as needed.	Personal Awareness and Responsibility Students manage their focus and attention during independent tasks, and take breaks when needed. Positive Personal and Cultural Identity Students build confidence in their mathematical abilities by sharing their ideas and strategies with the class. Social Awareness and Responsibility Students collaborate respectfully, listen to different perspectives during group work,

		and support peers in learning activities.

BIG IDEAS

(multiple subject areas for integrated unit)

Subject: Math
"Properties of objects and shapes can be described, measured, and compared using volume, area, perimeter, and angles." This unit supports the big idea by helping students describe and compare shapes through angle and side measurements. By classifying polygons, identifying triangle types, and exploring congruence, students use reasoning and tools to make sense of geometry in real-world contexts.

LEARNING STANDARDS

Curricular Competencies	Content
Reasoning and Analyzing ● CC1 - Use logic and patterns to solve puzzles and play games ● CC2 - Use reasoning and logic to explore, analyze, and apply mathematical ideas ● CC3 - Estimate reasonably ● CC4 - Use tools or technology to explore and create patterns and relationships, and test conjectures ● CC5 - Model mathematics in contextualized experiences Understanding and Solving ● CC6 - Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving ● CC7 - Visualize to explore mathematical concepts Communicating and Representing ● CC8 - Use mathematical vocabulary and language to contribute to mathematical discussions ● CC9 - Explain and justify mathematical ideas and decisions ● CC10 - Communicate mathematical thinking in many ways Connecting and Reflecting ● CC11 - Reflect on mathematical thinking	● C1 - Triangles ● C2 - Angle measurement and classification ● C3 - Combinations of transformations

● CC12 - Connect mathematical concepts to each other and to other areas and personal interests	

Prerequisite Concepts and Skills:

Students should already have a basic understanding of number sense and how to measure length in centimetres and millimetres. They should know how to use a ruler to draw straight lines and be familiar with terms like point, line, and angle from earlier grades. Some experience with measuring and comparing lengths will help, as students will be using rulers and protractors throughout the unit to measure and classify shapes.

Teacher Preparation Required:

Lesson #	Teacher Preparation Required (See Unit Plan Sample)
Lesson 1	● Prepare a set of real-life angle photos or objects for the hook (e.g., pizza slice, ladder, tongs, scissors, clock hands) ● Print and display an example chart showing types of angles (acute, right, obtuse, straight) ● Prepare whiteboard examples to model measuring with a protractor ● Print Angle Hunt recording sheets ● Set out rulers, protractors, and clipboards
Lesson 2	● Prepare whiteboard examples for estimating and measuring interior angles ● Print visuals showing how to distinguish regular vs. irregular polygons ● Gather sample visuals of regular and irregular polygons for the hook ● Prepare a space for displaying student puzzle pieces during the closure discussion
Lesson 3	● Prepare triangle suspect cards for the activity ● Prepare diagrams for triangle classification (sides and angles) and congruence ● Photocopy Triangle Detective case file worksheets for each student ● Prepare visuals showing triangle types and congruent triangle examples ● Review or prepare a short list of “clues” to present during the mystery activity
Lesson 4	● Prepare examples of the 3 triangles and 3 quadrilaterals labeled to be shown during the hook ● Prepare triangle and quadrilateral cutouts for the paper tear demonstration ● Print the Missing Angles worksheet with partially labeled shapes Set out rulers, protractors, and calculators for student use

Cross-Curricular Connections:

Although this unit is focused on Math, it naturally connects to other subject areas:

- Language Arts: Students practise speaking and writing as they explain their thinking, take part in group discussions, and reflect on their work. Activities like the Triangle Detective case file and Venn diagram reflection give them a chance to describe their reasoning clearly using full sentences.

- Art: The Polygon Puzzle and Symmetry Art extensions give students creative ways to explore geometry. They get to design, decorate, and build with shapes while thinking about angles, patterns, and symmetry in fun and hands-on ways.

Aboriginal Connections/ First Peoples Principles of Learning:

This lesson connects to the First Peoples Principle of Learning that learning supports the well-being of the self, family, and community. Students work together in groups, learning from each other and building a sense of connection and strengthening community in the classroom. Students will explore shapes and patterns in the world around them so they can make personal connections to their learning which will help them feel confident and supported.

Universal Design for Learning (UDL)

- Multiple means of engagement: Students can choose to work independently or with a partner for most tasks. Activities are designed to be hands-on and creative, which helps keep students motivated and focused. The Triangle Detective mystery and puzzle challenges are especially engaging for students who enjoy games and storytelling.
- Multiple means of representation: Key concepts are taught using visuals, physical models, and guided practice. Measuring and classifying shapes is modeled step-by-step using the whiteboard and real-world examples to make abstract ideas more concrete.
- Multiple means of action and expression: Students show what they know in different ways, through discussions, written reflections, creative projects, and visual problem solving. For example, they draw and label diagrams, explain their reasoning, and check their understanding through hands-on activities and worksheets.
- Extra support: Visual reminders and examples stay up throughout the unit. Tools like rulers and protractors are clearly demonstrated before students use them.

Differentiated Instructions (DI)

- Tasks are open-ended and allow multiple entry points
- Partner and small group options provide peer support
- Extra challenges available for early finishers
- Extension opportunities include designing shapes, creating problems, or exploring concepts outdoors
- Tools and templates can be provided
- Students can choose how to represent their thinking (drawing, measuring, explaining, creating)

Overview of Lessons:

Lesson 1

Name & Time (Minutes Allotted):	Measuring and Constructing Angles (50 mins)
Learning Standards: Curricular Competencies	Reasoning and Analyzing ● CC2 – Use reasoning and logic to explore, analyze, and apply mathematical ideas ● CC3 – Estimate reasonably ● CC4 – Use tools or technology to explore and create patterns and relationships, and test conjectures Understanding and Solving ● CC6 – Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving ● CC7 – Visualize to explore mathematical concepts Communicating and Representing ● CC8 – Use mathematical vocabulary and language to contribute to mathematical discussions ● CC9 – Explain and justify mathematical ideas and decisions Connecting and Reflecting ● CC11 – Reflect on mathematical thinking
Learning Standards: Content	C2 – Angle measurement and classification
Instructional Objectives	Students will be able to accurately estimate, classify, and measure angles using a protractor, and describe angles using appropriate mathematical vocabulary (acute, right, obtuse, straight).

Assessment:	What: Students will complete an Angle Hunt worksheet where they estimate, classify, and measure 3–5 angles they find in the classroom or outside. How: You will circulate and observe students during the activity to check how they're using their protractors and how accurately they estimate and classify angles. You will collect the completed worksheets at the end of the lesson to assess understanding and accuracy.
Teaching Strategies:	● Start with direct instruction to explain angle types and how to use a protractor. ● Use visual demonstrations on the whiteboard to model measuring angles step by step. ● Encourage hands-on learning by having students move around the classroom or outside to find angles in real life. ● Support student independence and collaboration during the Angle Hunt. ● Circulate during the activity to guide, prompt thinking, and correct misconceptions. ● Wrap up with a class discussion to reinforce learning and clear up any confusion.
Materials:	● Protractors ● Rulers ● Pencils and erasers ● Clipboards (optional for outdoor or hallway use) ● Angle Hunt recording sheet or math notebooks ● Whiteboard and markers ● Visuals or anchor chart showing types of angles (acute, right, obtuse, straight)
Lesson Activities:	
Introduction/Hook:	Begin by showing a series of photos that feature real-world angles (e.g., a slice of pizza, the hands of a clock, tongs, scissors). Ask students, "What do all of these things have in common?" Invite a few guesses.
Body:	Explain that all the photos shown in the hook have something in common which is that they each show a type of angle. Use this to introduce the four main types: acute, right, obtuse, and straight. Reshow the same photos from the hook and work together as a class to sort them into angle categories. For each one, ask students to describe the angle and decide which type it is. Explain how to estimate angle size by comparing it to a right angle. Model how to use a protractor step-by-step using one or two angles drawn on the board. Then, introduce the Angle Hunt activity. Students will move around the room and sketch 3–5 angles they find in real life. For each one, they will: ● Sketch ● Estimate whether it is acute, right, or obtuse and what the angle is ● Measure it with a protractor

	● Record the measurement and compare it to their estimate
Closure:	Bring students back together and ask: "Which angle was the trickiest for you to estimate, and why?" Invite a few students to share their responses and experiences. Review a couple of examples from student Angle Hunts on the board and highlight common successes or misconceptions. Emphasize the importance of checking estimates with measurement, and encourage students to keep practicing angle recognition in everyday life.

Lesson 2

Name & Time (Minutes Allotted):	Angles in Polygons and Classifying Polygons (50 mins)
Learning Standards: Curricular Competencies	Reasoning and Analyzing ● CC2 – Use reasoning and logic to explore, analyze, and apply mathematical ideas ● CC4 – Use tools or technology to explore and create patterns and relationships, and test conjectures Understanding and Solving ● CC6 – Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving ● CC7 – Visualize to explore mathematical concepts Communicating and Representing ● CC8 – Use mathematical vocabulary and language to contribute to mathematical discussions ● CC9 – Explain and justify mathematical ideas and decisions Connecting and Reflecting ● CC11 – Reflect on mathematical thinking
Learning Standards: Content	● C2 – Angle measurement and classification ● C3 – Properties of triangles and polygons
Instructional Objectives	Students will be able to accurately measure interior angles of polygons, classify shapes as regular or irregular, and explain what makes a polygon irregular using correct mathematical language.
Assessment:	**What**: Students will design and label a set of irregular polygon puzzle pieces with accurate angle measurements, and participate in a group or partner discussion about their classifications. **How**: You will observe students as they create and label their puzzle pieces, checking that they use a protractor accurately and classify shapes correctly. Collect puzzles and review the labelled angle measurements on the back of their pieces and listen during the sharing portion to assess their ability to explain their thinking and identify polygon properties.
Teaching Strategies:	● Begin with direct instruction to review angle sums and polygon classification

	● Use clear modelling on the board to demonstrate how to measure angles and identify regular vs. irregular polygons ● Encourage hands-on learning through puzzle creation ● Circulate during the activity to offer feedback, clarify misconceptions, and support measurement accuracy ● Provide opportunities for peer collaboration through puzzle swapping and discussion ● Use whole-class sharing time to highlight creative approaches and reinforce key concepts
Materials:	● Protractors ● Rulers ● Pencils and erasers ● Scissors ● Paper or cardstock (for puzzle pieces) ● Markers or coloured pencils (optional, for decorating pieces) ● Whiteboard and markers ● Sample visuals showing regular vs. irregular polygons
Lesson Activities:	
Introduction/Hook:	Draw or display six polygons on the board. Three should be regular and three irregular. Ask students to sort the shapes into two categories: regular and irregular. They can choose to work individually or in pairs or small groups of two to three. Once they have made their choices, ask, **"What made you group them that way?"** Invite a few students to share their thoughts with the class. Use this discussion to introduce the focus for the day—how to tell the difference between regular and irregular polygons and how to measure their interior angles.
Body:	After the discussion, explain that today's goal is to learn how to tell whether a polygon is regular or irregular and to practice measuring interior angles. Review that regular polygons have all sides and all angles equal, while irregular polygons do not. Model how to measure interior angles using a protractor, showing how to line up the baseline and vertex carefully and read the correct scale. Do one or two examples on the board and talk through the process clearly. Once students are comfortable, introduce the Polygon Puzzle activity. Each student will create between 4 and 7 puzzle pieces by drawing and cutting out different irregular polygons from paper or cardstock. On the back of each piece, they will measure and label all interior angles using a protractor. Encourage them to get creative with the shape and design of each piece, while still making sure their measurements are accurate. As they work, move around the room to support students with their measuring, provide feedback, and check that they are identifying irregular polygons correctly.
Closure:	To wrap up the lesson, invite students to display their polygon puzzle pieces on their desks or a shared table. Have a short class discussion with prompts like: **"What made this activity challenging?"**

	"How did you know your shape was irregular?" If time allows, students can swap puzzles with a partner and check each other's angle measurements for accuracy. This provides a chance to reinforce what they learned and see different creative approaches.

Lesson 3

Name & Time (Minutes Allotted):	Classifying Triangles and Congruence
Learning Standards: Curricular Competencies	Reasoning and Analyzing ● CC1 – Use logic and patterns to solve puzzles and play games ● CC2 – Use reasoning and logic to explore, analyze, and apply mathematical ideas ● CC4 – Use tools or technology to explore and create patterns and relationships, and test conjectures ● CC5 – Model mathematics in contextualized experiences Understanding and Solving ● CC6 – Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving ● CC7 – Visualize to explore mathematical concepts Communicating and Representing ● CC8 – Use mathematical vocabulary and language to contribute to mathematical discussions ● CC9 – Explain and justify mathematical ideas and decisions ● CC10 – Communicate mathematical thinking in many ways Connecting and Reflecting ● CC11 – Reflect on mathematical thinking
Learning Standards: Content	● C1 – Triangles ● C2 – Angle measurement and classification
Instructional Objectives	Students will be able to classify triangles by side length and angle type, and identify congruent triangles by comparing side and angle measurements using a ruler and protractor.
Assessment:	What: Students will complete the *Triangle Detective: Whodunnit* activity by classifying triangles and identifying the triangle that matches all the clues. How: You will circulate during the activity to observe students' use of rulers and protractors and listen for accurate mathematical vocabulary and reasoning. At the end, you will collect their case file worksheets to assess their ability to measure, classify, and justify which triangle fits the clues.
Teaching Strategies:	● Direct instruction with whiteboard examples to introduce triangle types and congruence ● Visual modeling of how to measure and compare side lengths and angles ● Inquiry-based learning through the detective mystery format ● Scaffolded support during the activity with guided clues and tools

	● Peer collaboration during the mystery investigation ● Whole-class discussion for reflection and consolidation of learning
Materials:	● Whiteboard and markers ● Rulers ● Protractors ● Triangle suspect cards (5–6 unique triangles per student or group) ● Case file worksheets (with clues and space to record reasoning) ● Pencils and erasers
Lesson Activities:	
Introduction/Hook:	Tell the class: "There's been a snack thief in the class. Someone, or something, has been sneaking into everyone's lunches and eating only the best snacks!" Reveal that the culprit isn't a person... it's a triangle! Show a few triangle "suspects" on the board and ask, "What do you notice about their sides and angles?" Use this discussion to build curiosity and transition into the mini-lesson on triangle types and congruence.
Body:	Start with a short lesson reviewing how to classify triangles by side length (scalene, isosceles, equilateral) and by angle type (acute, right, obtuse). Draw and label examples of each on the board. Then introduce the concept of congruence, triangles that are exactly the same in shape and size, even if rotated or flipped. Model how to use rulers and protractors to measure side lengths and angles, explaining how to compare two triangles for congruence. Next, introduce the Triangle Detective: Whodunnit activity. Give each student a case file and 5–6 triangle suspect cards. Present the clues (e.g., "The thief is an isosceles triangle with one right angle") and explain that they must investigate all the suspects. To correctly identify the culprit, they must also disprove all the other suspects by showing how they do not fit the criteria. Students use their rulers and protractors to measure, classify, and eliminate suspects one by one, justifying each decision in their worksheet.
Closure:	Regroup and reveal the correct triangle thief. Lead a short class discussion using prompts like: "Which clues helped you the most?" "What did you find tricky about ruling out the wrong suspects?" "How did you know you had the right triangle?" Clear up any common misconceptions and highlight the importance of thorough, logical reasoning in geometric classification.

Lesson 4

Name & Time (Minutes Allotted):	Sum of Angles in Triangles and Quadrilaterals / Finding Missing Angles
Learning Standards: Curricular Competencies	**Reasoning and Analyzing** ● CC2 – Use reasoning and logic to explore, analyze, and apply mathematical ideas ● CC3 – Estimate reasonably ● CC5 – Model mathematics in contextualized experiences **Understanding and Solving**

	● CC6 – Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving ● CC7 – Visualize to explore mathematical concepts **Communicating and Representing** ● CC8 – Use mathematical vocabulary and language to contribute to mathematical discussions ● CC9 – Explain and justify mathematical ideas and decisions **Connecting and Reflecting** ● CC11 – Reflect on mathematical thinking
Learning Standards: Content	● C1 – Triangles ● C2 – Angle measurement and classification
Instructional Objectives	Students will be able to determine the sum of interior angles in triangles and quadrilaterals, and use that knowledge to calculate missing angles. They will also be able to explain their reasoning and demonstrate their understanding using both visual models and mathematical strategies.
Teaching Strategies:	● Begin with a guided class activity to explore angle sums through hands-on calculation ● Use visual and physical modeling (paper tear demonstration) to solidify understanding ● Scaffold student learning with a mix of whole-class discussion and independent work ● Circulate the room to provide on-the-spot support and address misconceptions ● Encourage peer discussion and reasoning during the optional partner challenge at the end ● Use questioning strategies to promote reflection and explanation of thinking
Materials:	● Missing Angles worksheet (with partially labeled shapes) ● Rulers and protractors ● Pencils and erasers ● Paper
Lesson Activities:	
Introduction/Hook:	Begin the lesson by drawing three triangles and three quadrilaterals on the board, each with their angles labeled. As a class, work through each shape together. Ask students to help you add up the angles in each triangle and each quadrilateral. Prompt them with, "Try to notice something about the totals of the angles." Once all six shapes have been completed, ask: "What do you notice about the angle sums in the triangles? What about the quadrilaterals?" Use this as a transition into the idea that triangles always have a sum of 180° and quadrilaterals always have a sum of 360°.
Body:	Begin by confirming what students discovered during the hook activity. Explain that the interior angles of a triangle will always add up to 180°, and quadrilaterals always add up to 360°. Reinforce this concept with a visual demonstration using the paper tear method. Take a paper triangle, label its angles, and then tear off each corner. Arrange the three corners so their vertices meet in a line to demonstrate that together they form a straight angle (180°). Repeat this process

	using a paper quadrilateral to show that the four corners create a full circle when placed together (360°). Next, give students a worksheet with partially labeled triangles and quadrilaterals. Each shape will be missing one angle. Students must use subtraction from the total (180° or 360°) to find the missing angle. Encourage them to show their work and double-check using a calculator or protractor. As students work, circulate to check understanding, offer help, and clarify misconceptions about angle types and measurement. During their independent work, I will walk around the room, providing help where needed and checking that students are correctly classifying the triangles and using their tools accurately.
Closure:	Wrap up the lesson with a short discussion. Ask: ● "What strategies helped you figure out the missing angles?" ● "How did you check your work or know your answers were reasonable?"

Resources:

5 Measuring reflex angles
Math Antics - Angle Basics
Math Antics - Points, Lines, & Planes
Congruent
Kahoot!
Polygon Puzzle | NZ Maths
Sum of the Interior Angles of a Quadrilateral Proof | Paper Cutting Activity
Sum of the Exterior Angles of a Triangle Proof | Paper Cutting Activity

Extensions to Unit:

- Extra work for early finishers will be available, including additional classification and measurement activities from the workbook.
- End-of-unit geometry scavenger hunt where students sketch and label examples of triangles, angles, and polygons they find around the classroom or school. Finished sheets can be turned in for a small prize.
- Build 3D models of geometric shapes using straws, toothpicks, or other building materials to explore sides, angles, and congruence.
- Symmetry art project where students create a design that includes symmetry, congruent shapes, and transformations. They will use rulers and protractors to ensure accuracy in their artwork.

Reflections and Revisions

We were provided with worksheet examples from our teacher mentor based on what sort of content we should be basing our lessons off of. I am a big fan of gamifying or adding a hands-on element as often as I can however, so I just used the worksheets as a baselines of what to base my lessons off of. Because of this however, the content in the unit plan may differ slightly from the curriculum, but it is matched to the current needs of the class, as I was told by my teacher mentor.

I have not gotten organised to create the worksheets for my lessons yet, but I will be working on them over the weekend and I can send them over to you to have a look at when I'm finished.