

Bachelor of Education (Elementary) & Bachelor of Education (Secondary) STEM Unit Plan Template

Unit Title: Perimeter Number of Lessons 8 Time (In weeks): 2
 Name: Tianna Frost Subject(s): Mathematics Grade(s): 4/5

Rationale

This unit provides an introduction into measurement while building on past education to create deeper understanding of measurement. It also provides students with multiple means of learning in order to help reach all learners.

Overview:

This unit plans main focus is to establish more knowledge for students about perimeter and ways we can use it in our lives to showcase its value and importance. It will start off by creating student interest with finding perimeter of the classroom providing hands-on, real-life learning. Next the students will take outside to find the perimeter of objects they interact with daily.

The middle of the unit provides collaborative work through CGI giving students a chance to collaborate and talk through their ideas ending in the showcase of multiple strategies to solve perimeter whilst also giving me more opportunities to gauge their learning.

The summative goal of this lesson will be in lesson 6, 7 and 8 and will be students dream house creation, making it cross curricular with Arts Education. It will showcase students' knowledge of perimeter. The dream house project gives students the opportunity to express their creativity and model their learning of perimeter. The unit will be wrapped up with the final dream house project mentioned above and shared with the class.

CORE COMPETENCIES

Communication	Thinking	Personal & Social
<ul style="list-style-type: none"> • Communication <ul style="list-style-type: none"> ○ Connecting and engaging with others <p>Students will share in class discussions as well as sharing their dream house project as a way to celebrate all the different ideas and practice listening and speaking in a respectful way.</p> <ul style="list-style-type: none"> • Collaboration <ul style="list-style-type: none"> ○ Working Collectively ○ Supporting Group Interactions <p>Lesson 1 and 2 will involve small group work where students work together towards a common goal: solving the</p>	<ul style="list-style-type: none"> • Critical thinking <ul style="list-style-type: none"> ○ Designing and developing <p>Student's will use critical thinking throughout each lesson to make practical guesses, problem solve and design their own questions.</p> <ul style="list-style-type: none"> • Creative thinking <ul style="list-style-type: none"> ○ Creating and Innovating ○ Generating and incubating ○ Evaluating and developing <p>During lesson 4 specifically, students will be able to explore their creative thinking by</p>	<ul style="list-style-type: none"> • Positive personal and cultural identity <ul style="list-style-type: none"> ○ Identifying personal strengths and abilities <p>Students are at varying levels and acknowledging this is okay and normal. Students will know that they all have strengths and with the dream house project they can showcase strengths in different areas.</p> <ul style="list-style-type: none"> • Social responsibility <ul style="list-style-type: none"> ○ Building Relationships ○ Valuing diversity <p>During group work students will be building relationships</p>

perimeter questions.	designing a dream house and finding the perimeter of it. They will be able to creatively come up with any house plan they wish and decorate it any way they want.	with their peers as well as the teacher. Whilst sharing their dream house we will acknowledge and celebrate the differences between everyone's "dream house" which will emphasize differences and how they are great.
----------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

BIG IDEAS

(Multiple subject areas for integrated unit)

Math (5)	Math (4)
Closed shapes have area and perimeter that can be described, measured, and compared.	Polygons are closed shapes with similar attributes that can be described, measured, and compared.

LEARNING STANDARDS

Curricular Competencies	Content
CC# 5: Model mathematics in contextualized experiences	C# 11: one-step equations with variables (grade 5)
CC# 2: Estimate reasonably	C# 13: relationships between area and perimeter (grade 5)
CC# 15: Connect mathematical concepts to each other and to other areas and personal interests	C# 14: perimeter of regular and irregular shapes (grade 4)

Prerequisite Concepts and Skills:

<ul style="list-style-type: none"> • What a regular shape and an irregular shape is • Using units (g, cm, m etc.) • Solving equations with a variable • How to use a ruler • Vertical surface lesson structure (switching pen, working together, etc.)

Teacher Preparation Required:

Lesson #	Teacher Preparation Required (See Unit Plan Sample)
Lesson 1	-gather shape blocks -background knowledge about perimeter -exit ticket
Lesson 2	-classroom measured -video watched -exit ticket
Lesson 3	-students grouped -book read and ready -rulers
Lesson 4	-questions formed -whiteboards
Lesson 5	-questions -whiteboards -worksheet
Lesson 6	-instruction sheet -book

	-work sheet
Lesson 7	-started dream houses -video watched and ready
Lesson 8	-sharing instructions

Cross-Curricular Connections:

- Arts Education- designing dream house
- English Language Arts-reading stories
- Social Studies- Traditional Indigenous housing

Aboriginal Connections/ First Peoples Principles of Learning:

- Learning is embedded in memory, history, and story.
Story will be used in a couple lessons within the unit to aid in the understanding of perimeter as well as create engagement. Memory also plays a role because perimeter will be built of previous prerequisite knowledge and building on that.
- Learning involves patience and time.
This principle is always applicable because just as it states learning takes time, mastery does not occur right away but rather takes practice and it is important to explicitly state this and remind students throughout the unit.
- Learning requires exploration of one's identity.
Students will be able to explore their identity through their creativity and choices in how they build their house.

Further Indigenous Connections include discussing Indigenous places of dwelling such as pit houses when using examples of houses students can create to find the perimeter of.
Working as a collective during group work also relates to the Aboriginal Pedagogy Framework.

Universal Design for Learning (UDL)

MULTIPLE MEANS OF REPRESENTATION –

- Visual Aids such as, videos, photos
- Brainstorming and giving time to collect thoughts
- group discussions/ CGI
- designing/artwork
- verbal activities
- written instructions on the board and verbally stated

MULTIPLE MEANS OF ACTION AND EXPRESSION –

- Movement
- artwork
- writing
- oral discussions

MULTIPLE MEANS OF ENGAGEMENT –

- collective elements and individual aspects including group work and group discussions
 - o Group work might make it easier for students to feel heard and be comfortable sharing
 - o Group discussions can help students make connections and get ideas
 - o writing options during reflections

Differentiated Instruction (DI):

For students who are uncomfortable sharing orally and participating verbally in class discussion it will be stated that everyone must share but it can be done through different outputs such as, writing, drawing, sharing a video and other options can be discussed and considered. Oral sharing will be encouraged but alternative options available for everyone.

For students who get easily distracted or deal with sensory overload I will use a noise meter on the projector to keep noise levels down but also create a quiet corner in the classroom where students can go to work.

For students who struggle with transitions (as I experienced in my practicum) a timer can be used for students to track how much time they have

For students who like auditory learning class discussion and oral sharing will be used.

For students who like visual learning there will be videos shown in class, instructions written on a whiteboard, artwork, and photos in PowerPoints.

For students who struggle with math/students with IEP's adjustments will be made such as reduced workload, calculators, scaffolded assignments

For students who are above grade level, extra work/questions will be prepared to challenge them and available for early finishers

Once in the classroom this section can be readdressed as I get to know the students and their needs.

Overview of Lessons:

Lesson 1

Name & Time (Minutes Allotted):	Intro to perimeter (35 Minutes)
Learning Standards: Curricular Competencies	<ul style="list-style-type: none">• CC# 5: Model mathematics in contextualized experiences• CC#4: Use technology to explore mathematics
Learning Standards: Content	C# 14: perimeter of regular and irregular shapes (grade 4) C#13 relationships between area and perimeter
Instructional Objectives	<ul style="list-style-type: none">• Identify irregular and regular shapes• Explain how units are used• Proper ruler/measuring procedure
Assessment:	<ul style="list-style-type: none">• Formative: Observations and conversations with the teacher who will write notes about comprehension based off these interactions• Formative: read exit ticket to check for comprehension/how to move forward with next lesson
Teaching Strategies:	<ul style="list-style-type: none">• group work• manipulative resources• positive and encouraging tone• praise effort• use job helpers to keep routines (ex. Paper passers)• Schema activation• Physical activity during hook to serve as intro to concept and brain break

	<ul style="list-style-type: none"> • exit ticket • random group selection • work prepared for early finishers
Materials:	<ul style="list-style-type: none"> -shapes/blocks -paper -pencils -whiteboard markers
Lesson Activities:	
Introduction/Hook:	<ul style="list-style-type: none"> -Pass out shape blocks to tables that include regular and irregular shapes. -ask students to work as a group at their tables to decide what is the same and different about the blocks -facilitate discussion -guide to specific answer about irregular and regular shapes
Body:	<ul style="list-style-type: none"> -define irregular and regular shapes -explain we will be working with these shapes in the following math lessons -ask what we need to know about measurement -discussion -guide to answers about units and proper ruler use
Closure:	<ul style="list-style-type: none"> -ask students to draw an irregular shape and measure one side and label length -hand in

Lesson 2

Name & Time (Minutes Allotted):	Find the Perimeter of the Room (60 Minutes)
Learning Standards: Curricular Competencies	<ul style="list-style-type: none"> • CC# 6: Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving • CC#12: Explain and justify mathematical ideas and decisions
Learning Standards: Content	<ul style="list-style-type: none"> • C# 11: one-step equations with variables (grade 5) • C# 13: relationships between area and perimeter (grade 5) • C# 14: perimeter of regular and irregular shapes (grade 4)
Instructional Objectives	SWBAT: calculate perimeter of a regular shape
Assessment:	Formative: Observations and conversations with the teacher who will write notes about comprehension based off these interactions
Teaching Strategies:	<ul style="list-style-type: none"> • real life context • group work • multimedia resources • positive and encouraging tone • praise effort • Schema activation • Physical activity during hook to serve as intro to concept and brain break • exit ticket • random group selection • work prepared for early finishers
Materials:	<ul style="list-style-type: none"> • Notes prepared for points to discuss about perimeter • string cut and measured to find perimeter of classroom • calculated perimeter of classroom • sample questions to do on the board

	<ul style="list-style-type: none"> • checklist/notepad for discussions and observations • learning ladder • exit tickets • YouTube video watched and ready https://www.youtube.com/watch?v=vbz-v2XplU0 • Whiteboard markers • Paper • Pencils • String • String • Rulers • Meter sticks • cards • rulers
Lesson Activities:	
Introduction/Hook:	-Schema Activation: Ask students if they know the perimeter of the classroom?
Body:	<p>-have students find out with different measuring tools such as meter stick, ruler, precut string in groups of 3 and give measurements of the string written on the board</p> <p>-calculate perimeter on board as a class.</p> <p>-further discuss perimeter and strategies to solve for missing sides and irregular shapes</p> <p>-watch YouTube video https://www.youtube.com/watch?v=vbz-v2XplU0</p> <p>-solve problems on the board as a class</p>
Closure:	<p>-wrap up what we learned such as solving perimeter with missing side</p> <p>-exit ticket: write down any questions, worries or uncertainties they have about perimeter.</p>

Lesson 3

Name & Time (Minutes Allotted):	Outdoors Measurement (60 Minutes)
Learning Standards: Curricular Competencies	<ul style="list-style-type: none"> • CC# 6: Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving • CC#12: Explain and justify mathematical ideas and decisions
Learning Standards: Content	<ul style="list-style-type: none"> • C# 11: one-step equations with variables (grade 5) • C# 13: relationships between area and perimeter (grade 5) • C# 14: perimeter of regular and irregular shapes (grade 4)
Instructional Objectives	SWBAT: calculate perimeter of a regular and irregular polygon
Assessment:	Formative: Observations and conversations with the teacher who will write notes about comprehension based off these interactions
Teaching Strategies:	<ul style="list-style-type: none"> • real life context • group work • multimedia resources • positive and encouraging tone • praise effort • Schema activation • Physical activity during hook to serve as intro to concept and

	<ul style="list-style-type: none"> brain break • exit ticket • random group selection • work prepared for early finishers
Materials:	- <i>Perimeter, Area, and Volume: A Monster Book of Dimensions</i> by David A. Adler -Rulers -pencils -paper
Lesson Activities:	
Introduction/Hook:	-Read book: <i>Perimeter, Area, and Volume: A Monster Book of Dimensions</i> by David A. Adler
Body:	-discussion about what we learned yesterday -ask what shapes we can find outside and what shapes we can measure the perimeter of -group students -go outside to measure perimeter of outdoor objects
Closure:	-come back inside -discuss what different objects we measured and why we would need to measure them

Lesson 4

Name & Time (Minutes Allotted):	Vertical Surface Lesson (20 Minutes)
Learning Standards: Curricular Competencies	<ul style="list-style-type: none"> • CC# 6: Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving • CC#12: Explain and justify mathematical ideas and decisions
Learning Standards: Content	<ul style="list-style-type: none"> • C# 11: one-step equations with variables (grade 5) • C# 13: relationships between area and perimeter (grade 5) • C# 14: perimeter of regular and irregular shapes (grade 4)
Instructional Objectives	<ul style="list-style-type: none"> • SWBAT: work collaboratively • SWBAT: recognize multiple strategies • SWBAT: Solve perimeter of irregular shapes
Assessment:	Formative: Observations and conversations with the teacher who will use write notes about comprehension based off these interactions
Teaching Strategies:	<ul style="list-style-type: none"> • Sharing multiple ways of thinking, showcase there is no one way to encourage positive math mindset • Circulating • group work • positive and encouraging tone • praise effort • Group work appropriate for grade level • Group sizing appropriate for grade level • Prepared and organized for lesson • random group selection • work prepared for early finishers
Materials:	<ul style="list-style-type: none"> • checklist/notepad for discussions and observations • whiteboards/dry erase sheets • dry erase markers

	<ul style="list-style-type: none"> • rulers • deck of cards
Lesson Activities:	
Introduction/Hook:	-have students pick a card and go to numbered white board area -explain instructions (vertical surface expectations: one person with marker at a time, all working collaboratively etc.)
Body:	-ask relevant perimeter questions (draw a square and an irregular polygon) -give work time (solve problem) -discuss ways they solved their problem
Closure:	-discuss how there was more than one way -talk about the most efficient way. (ex. Square they only needed to measure one side)

Lesson 5

Name & Time (Minutes Allotted):	CGI Perimeter (60 Minutes)
Learning Standards: Curricular Competencies	CC# 2: Estimate reasonably CC# 15: Connect mathematical concepts to each other and to other areas and personal interests CC# 5: Model mathematics in contextualized experiences
Learning Standards: Content	C# 11: one-step equations with variables (grade 5) C# 13: relationships between area and perimeter (grade 5) C# 14: perimeter of regular and irregular shapes (grade 4)
Instructional Objectives	SWBAT: work collaboratively SWBAT: recognize multiple strategies SWBAT: Solve perimeter of irregular shapes
Assessment:	Formative: Observations and conversations with the teacher who will use write notes about comprehension based off these interactions
Teaching Strategies:	<ul style="list-style-type: none"> • CGI style lesson (does not follow CGI exactly) • Sharing multiple ways of thinking, showcase there is no one way to encourage positive math mindset • Circulating • Encouragement • Group work appropriate for grade level • Appropriate group sizes • Prepared and organized for lesson • Eyes and ears on me
Materials:	<ul style="list-style-type: none"> • story created and memorized • comprehension questions • student pairing method (popsicle sticks) • checklist/notepad for discussions and observations • little whiteboards • dry erase markers
Lesson Activities:	
Introduction/Hook:	-Tell story (There was a person fencing his backyard, draw shape of the yard on the board (see attached image) and state the length of some of the sides, do not write them with the drawing as done in the example) what is the perimeter the man will have to fence -Have a student retell the story -Ask comprehension questions (related to the irregular shape in the story)

Body:	-pair students in small groups of 3 with cards -Give students work time -circulate -pick groups to share -ask discourse question -work on worksheet
Closure:	-hand in worksheet -discuss another way someone might use perimeter besides building a fence

Lesson 6

Name & Time (Minutes Allotted):	Dream House intro (60 Minutes)
Learning Standards: Curricular Competencies	CC# 5: Model mathematics in contextualized experiences CC# 16: Connect mathematical concepts to each other and to other areas and personal interests CC#12: Explain and justify mathematical ideas and decisions
Learning Standards: Content	C# 11: one-step equations with variables (grade 5) C# 13: relationships between area and perimeter (grade 5) C# 14: perimeter of regular and irregular shapes (grade 4)
Instructional Objectives	<ul style="list-style-type: none"> • SWBAT: Measure and solve perimeter of irregular shapes • SWBAT: create their own problems and solve
Assessment:	Formative: observations and conversations with students
Teaching Strategies:	<ul style="list-style-type: none"> • students help handout sheets • Schema activation with book • Class discussions • Individual worktime • Multimedia resources • Circulating • Giving real life context • Brainstorming together
Materials:	<i>If I Build a House</i> book -paper -graph paper -pencils -handout with instructions -pencil crayons -markers -crayons
Lesson Activities:	
Introduction/Hook:	-Read Book "If I Build a House" -ask what would your dream house look like? -short discussion -brainstorm on whiteboard
Body:	-show photos of traditional Secwépemc living such as pit houses, show other traditional housing types. -handout dream house project -work time

	-circulate and give help as needed
Closure:	-share our strategies and discuss

Lesson 7

Name & Time (Minutes Allotted):	Building the Dream house (60 Minutes)
Learning Standards: Curricular Competencies	CC# 5: Model mathematics in contextualized experiences CC# 16: Connect mathematical concepts to each other and to other areas and personal interests CC#12: Explain and justify mathematical ideas and decisions
Learning Standards: Content	C# 11: one-step equations with variables (grade 5) C# 13: relationships between area and perimeter (grade 5) C# 14: perimeter of regular and irregular shapes (grade 4)
Instructional Objectives	<ul style="list-style-type: none"> • SWBAT: Measure and solve perimeter of irregular shapes • SWBAT: create their own problems and solve
Assessment:	Formative: observations and conversations with students
Teaching Strategies:	<ul style="list-style-type: none"> • students help handout sheets • Schema activation with video • Class discussions • Individual worktime • Multimedia resources • Circulating • Giving real life context • Brainstorming together
Materials:	paper, graph paper, pencils, pencil crayons, markers, crayons
Lesson Activities:	
Introduction/Hook:	-Watch Video https://www.youtube.com/watch?v=zvewCudtFZs -before video starts asks students to watch out for the shapes they see -ask what students noticed about the buildings -short discussion
Body:	-handout dream house project -work time -circulate and give help as needed
Closure:	-share our strategies and discuss

Lesson 8

Name & Time (Minutes Allotted):	Dream House Sharing (60 Minutes)
Learning Standards: Curricular Competencies	CC# 5: Model mathematics in contextualized experiences CC# 16: Connect mathematical concepts to each other and to other areas and personal interests CC#12: Explain and justify mathematical ideas and decisions
Learning Standards: Content	C# 11: one-step equations with variables (grade 5) C# 13: relationships between area and perimeter (grade 5)

	C# 14: perimeter of regular and irregular shapes (grade 4)
Instructional Objectives	SWBAT: share their work SWBAT: Measure and solve perimeter of regular and irregular shapes
Assessment:	Summative: collect dream houses and analyze math solutions
Teaching Strategies:	<ul style="list-style-type: none"> • students help handout sheets • Class discussions • Individual worktime • Activity for early finishers • Effort praise, compliment all different designs • Sharing ideas • Use of creativity encouraged • Freedom to design • Real life context • Displaying project to show it was not something they did for no reason
Materials:	Smart board/projector, Paper, ruler, pencils, crayons, markers, whiteboard markers
Lesson Activities:	
Introduction/Hook:	-Reintroduce project -ask for questions -address any confusion
Body:	-work time/ coloring -circulate and give help as needed -share our dream houses
Closure:	-discuss what we learned about everyone having different houses, what we liked and disliked about the project and perimeter -hang houses in classroom

Resources:

- First Peoples Principles of Learning: <http://www.fnesc.ca/first-peoples-principles-of-learning/>
- *If I Built a House* by Chris Van Dunsen
- *Perimeter, Area, and Volume: A Monster Book of Dimensions*
- Aboriginal Pedagogy Framework
- YouTube <https://www.youtube.com/watch?v=vbz-v2XplU0>

Extensions to Unit:

- Discuss area and find the area of the dream house
- Relationship between area and perimeter
- Other types of measurement such as volume

Reflections and Revisions

--