

Annotated Unit Plan Template Understanding By Design Model

(Revised: October 2020)

Title of Unit	Perimeter, Area, and Volume	Grade Level	Grade 6
Subject	Mathematics	Time Frame	For assignment it is 4 classes, if it was being done in a real classroom we need more class to finish covering the unit.
Developed By	Paityn Ireland		

Stage 1 - Identify Desired Results

Saskatchewan Curricular Learning Outcome(s)

What relevant goal(s) will this unit address?

Outcomes

Extend and apply understanding of perimeter of polygons, area of rectangles, and volume of right rectangular prisms (concretely, pictorially, and symbolically) including:

- relating area to volume
- comparing perimeter and area
- comparing area and volume
- generalizing strategies and formulae
- analyzing the effect of orientation
- solving situational questions.

Indicators

- a. Generalize formulae and strategies for determining the perimeter of polygons, including rectangles and squares.
- b. Generalize a formula for determining the area of rectangles.
- c. Explain, using models, the relationship between the area of the base of a right rectangular prism and the volume of the same 3-D object.
- d. Generalize a rule (formula) for determining the volume of right rectangular prisms.
- e. Analyze the effect of orientation on the perimeter of polygons, area of rectangles, and volume of right rectangular prisms.
- f. Solve a situational question involving the perimeter of polygons, the area of rectangles, and/or the volume of right rectangular prisms.

Essential Questions

What provocative questions (one or two) will foster inquiry into the content?

1. What is perimeter and how do we find it?
2. How can we create formulas to find perimeter, area, and volume?

Knowledge:

What math knowledge will student acquire as a result of this unit? (think of nouns – chunks of knowledge)

Students will know...

- *what perimeter is.*
- *how to find the perimeter.*
- *create a formula to find the perimeter.*
- *how we use perimeter in real life.*
- *what area is.*
- *how to find the area of the rectangle.*
- *use a formula and create a formula to find the area.*
- *how we use areas in real life to solve problems.*
- *what volume is.*
- *how to find the volume.*
- *how to create a formula to find the volume.*
- *how we use volume to solve problems in everyday life.*
- *the effect of orientation on the perimeter of polygons, area of rectangles, and volume of right rectangular prisms.*

Skills

What math skills will students acquire as a result of this unit? (think of verbs – what will you be able to observe students doing)

Students will be able to...

- *find the perimeter of a shape.*
- *create a formula for the perimeter.*
- *find the area of a rectangle.*
- *create a formula to help find area.*
- *find the volume of a rectangular prism.*
- *find a formula to find the volume of a rectangular prism.*
- Explain, using models, the relationship between the area of the base of a right rectangular prism and the volume of the same 3-D object.
- Solve a situational question involving the perimeter of polygons, the area of rectangles, and/or the volume of right rectangular prisms.

Stage 2 – Assessment Evidence (excerpt)

Mathematical Misconceptions (or errors) [use resource posted on UR Courses]

What kind of mathematical misconceptions might students display during this unit? What can you, as teacher, do to specifically address these?

1. Changes in Orientation
 - a. A student might think that when a shape changes orientation that the whole shape changes, but in fact it does not. A way to overcome this as a teacher would be to show students with 3-D blocks for that shape, so students can move the shape around and understand that it does not really change.
2. 2-D and 3-D Vocabulary
 - a. Students can often confuse words used with 2-D and 3-D shapes, and we can avoid this by teaching them vocabulary first and then jumping into content. As teachers introduce a new shape such as a cube we need to remember to use the proper name not calling it a square. If we call it a square it can confuse the students. Also when we make the transition between 2-D shape learning to 3-D shape learning we need to make sure we our

3. Assuming a Longer Object has more Volume
 - a. Sometimes when students look at longer objects they believe that it has more volume, when in fact it does not. A way we as teachers can show them that this is not true is by having the actual 3-D objects with the students and they can move them and around. Another way we could do this is by having the students do the actually calculations, therefor they can figure out for themselves that the longer shape does not actually have more volume.

Evidence

Through what evidence – student work samples, observations, quizzes, tests, self-assessment or other means – will students demonstrate achievement of the desired results of this unit?

Throughout this unit I plan on gathering my different types of assessment.

1. Math Journals - I hope to have students write daily in their math journals about how they think they are doing and what they do and do not understand.
2. Exit Slips - I plan to have exit slips at the end of some classes, these exit slips will ask kids about the main point of the lesson we covered that day.
3. Daily Activity - I plan to have students participate in an activity everyday and have to hand something in to be marked on to show that they have learned something.
4. Observations - Students will also be marked on observations I make during class activities, their participation in both class activities and group work throughout the unit.

Stage 3 - Learning Plan (Stage 3)

Where are your students headed? Where have they been? How will you make sure the students know where they are going?	Students are headed in a direction of learning perimeter, area and volume, and how they will be able to find these things looking at the shape given to them in the unit. They will also learn how to answer questions looking for these answers. Most of these should all be knowledge that they have from grade 5, but that is not always the case. For students who struggled with the topics or do not remember from last year there is opportunity to begin again and learn again. At the beginning I plan on letting students know what direction this unit is going and how these things can be used in real life.
How will you hook students at the beginning of the unit and engage their interest?	I plan on hooking students by giving them the 2-D and 3-D that we will be using throughout the unit and asking them to name them and come up with the components that make up each shape. This is a good way to see where their thinking is at, and what they remember, and a good way to set u p and expand from 2-D shapes to 3-D shapes.
What events will help students experience and explore the big ideas and essential questions in the unit? How will you equip them with needed skills and knowledge?	By having moments within the lesson when they can explore the concepts with open ended tasks, they should allow students to reach the answers and find the big idea on their own with teacher guidance.I plan on giving them the background knowledge, and making sure they know the basics of shapes before moving on to the main unit.
How will you cause students to reflect and rethink? How will you guide them in rehearsing, revising, and refining their work?	I want students to reflect on what we learn in class often which is why I will be using math journals through this unit and all units so I am able to gage what students understood from the lesson. By leaving them with reflection questions after every lesson to answer in these journals I should be able to understand where students are at and whether they understand. These journals will also give students a chance to think deeply about the understanding of the

	topic within the classroom. I also think it is always important to go back and go over mistakes instead of just moving on, and students will be going back through assignments and fixing marks and making sure that they are on the right path.
How will you help students to exhibit and self-evaluate their growing skills, knowledge, and understanding throughout the unit?	I want students to show their knowledge in a variety of ways within the classroom, through their knowledge they should be able to show me within activities if they understand the topics. I also believe in stopping and taking a minute to check in with students so they have the option to self-evaluate where they think they are at in terms of understanding.
How will you tailor and otherwise personalize the learning plan to optimize the engagement and effectiveness of ALL students, without compromising the goals of the unit?	This unit can be personalized on questions and topics the questions are asking. For a student who is lacking interest there are options to bring their interests into the subject, and the work. When creating a plan for a class you will most likely know the students within the class that struggle. If you are lucky enough to know the students ahead of time you can already have these tailored options ready for them. When tailoring these activities it is important to look at the key values with the outcome and make sure we are still reaching the end goal for the student.
How will you organize and sequence the learning activities to optimize the engagement and achievement of ALL students?	I plan to put it in the order that will provide a logical path for students to learn and it will allow them to engage and grow, along with the material. The order of lessons need to provide a path for students to follow, by starting with perimeter and area of 2-D shapes and then allowing a path towards being able to find volumes of 3-D shapes.

How will we get there? Instructional Plan – activities:

<p>Consider using: Mini-lessons Multiple Intelligences Models Manipulatives Rich problems Math journals Games Stations Literature Integration with other subject areas Projects Homework</p> <p>Resources: Teacher’s guide Textbook Technology Equipment Books</p>	<p>Activities/Lesson 1 - Intro and Recall Lesson Source of activity: https://www.weareteachers.com/area-and-perimeter/ (Activity 6) Objective(s): This is an intro lesson to get students thinking about what they have learned in the past, and in grade 5. It is to get their brains working and recalling knowledge from the last school year. This will also lay a base for the kids that might not be able to remember last year, or they did not understand last year. Hook: A class brainstorm and look into the words of Perimeter, Area, and Volume, and starting with what they mean and what the students know about them. Brief description of activity: Students will be given a sheet of graph paper and told to draw themselves in block form. Once they sketch themselves out they can then colour themselves in. On the way they will then have to calculate the perimeter and area of themselves or the picture of themselves. Now will be time to open up the questions and debrief what these mean. Assessment: Students will be asked to fill out an exit slip after class in the math journals to be marked and gage understand, and remember what they did not, and what they learned.</p> <p>Activities/Lesson 2 - Perimeter Source of activity: https://www.weareteachers.com/area-and-perimeter/ (Activity 11) Objective(s): This is to teach kids about perimeter and why this might be important in everyday life, or how we could use this in the future. and Also giving students a way to calculate perimeter in a more active way. This is also to stop and have to have students think critically about creating formulas to find perimeter.</p>
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<p>Strategies: T-chart Think/Pair/Share KWL Drama Connections</p>	<p>Hook: I will be asking the question: What uses could we have to find perimeter? During this I would use Think-Pair-Share. This is just meant to be quick and get students thinking.</p> <p>Brief description of activity: For this activity I would have taped out shapes across the classroom floor (this would only work if the floor is tiled, if not you would have to use printable shapes with grids on them, or have students measure. Students would be responsible for travelling around the classroom and collecting the perimeters to how they found the shapes. At the end of class we would come together and discuss how students found the perimeter and create the formula together as a class (I would use an anchor chart that could be hung up in the classroom for future use).</p> <p>Assessment: Students will be marked on the sheet they hand in showing their work from finding the perimeter of all the shapes around the classroom. They would also be marked on the reflective exit slip question they would answer in their math journal.</p> <p>Activities/Lesson 3 - Area (Rectangle Art)</p> <p>Source of activity: https://www.scholastic.com/teachers/articles/teaching-content/hands-teaching-area-and-volume/</p> <p>Objective(s): This lesson will help students be able to</p> <p>Hook: We will have a quick discussion at the beginning of class of how we might use the area in our lives, and why it is important for us to know. We will then create an anchor chart (using an anchor so it can be hung up on the classroom wall to refer back to later) comparing perimeter and area using a venn diagram. These would allow students to think about why they are the same and why they are different.</p> <p>Brief description of activity: Students will be given paper scraps to cut rectangles out of, and they will need to know the area of all the rectangles that they cut out. they will then use the cut out rectangles of all different shapes to</p> <p>Assessment: At the end of this lesson students will be marked on their final project and the end of class and the understanding of the area and combining the areas of many rectangles to make a bigger shape. Extra: for students who may have extra time at the end of class can play the Area Dice Game, which will allow them to still learn in the form of a game. (source: https://www.pinterest.ca/pin/217228382011162844/)</p> <p>*There would be more lessons within this unit that would hit the remainder of outcomes, and explore more.</p>
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From: Wiggins, Grant and J. Mc Tighe. (1998). *Understanding by Design*, Association for Supervision and Curriculum Development
ISBN # 0-87120-313-8 (ppk)

Full Lesson Plan

(this includes the activity that you will present to peers in class)

LESSON DESIGN Planning Template (V2):

Based on the Ideas of Madeline Hunter and Barrie Bennett's Beyond Monet

Title of Lesson: Finding Volume	Subject & Grade: Grade 6 Math
Topic: Volume	Designer(s): Paityn Ireland
<p>Original Source(s) of activities: <i>Activity was adapt from this website, and we did activities similar to this in school:</i> https://jenniferfindley.com/teaching-volume-common-core-resource/ Also chose do to an anchor as a way to show students understand and as a classroom learning tool as we are using them within our ELNG class.</p>	

<p>Outcome (and appropriate indicators) from Saskatchewan Curriculum</p>	<p>SS6.2 - Extend and apply understanding of perimeter of polygons, area of rectangles, and volume of right rectangular prisms (concretely, pictorially, and symbolically) including:</p> <ul style="list-style-type: none"> ● relating area to volume ● comparing perimeter and area ● comparing area and volume ● generalizing strategies and formulae ● analyzing the effect of orientation ● solving situational questions. <p>Indicators</p> <p>c. Explain, using models, the relationship between the area of the base of a right rectangular prism and the volume of the same 3-D object.</p> <p>d. Generalize a rule (formula) for determining the volume of right rectangular prisms.</p>
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<p>Why these activities? (How are they appropriate? How are they effective?)</p>
<p>I choose these activities because I believe they will give the students opportunities to explore volume in a fun and individual or group way (depending on supplies). This gives students to come up with a way to find volume and create the formula that students will be using in the future. I also believe by using an anchor chart we as a class are creating a resource for students to use in the future. Also by creating</p>

a leaderboard for who has the largest and who has the smallest shape based on volume and students can see the visual of the shapes side by side.

Assessment: How will you know what students have learned?
 What evidence of misconceptions will you need to look out for?

I plan on having kids answer questions on an exit slip at the end of class, it will contain reflection questions on what we have learned and what the students has obtained from the lesson as well.

Required Resources & Materials for lesson activities

1. containers
2. dried pasta
3. measurement tools
4. Boxes with a variety of sizes
5. rulers
6. pencils and paper
7. White board and markers

Activity Plan: you can insert your own sections to this but must start with "Mental Set (Hook)" and end with "Closure"

Stage	Timing	Teacher Activity	Student Activity
Mental Set (Hook)	10 min	We will be looking at what and how volume works. I would be taking containers of a variety of sizes, and then taking dried pasta and filling one of the containers. We can then move the pasta from one container to the next noticing that different amounts fit in different containers.	Students can also do this depending on how many supplies you have available, and if there's enough for all students to participate or do this in groups.

Class Discussion/Ancor chart	7 min	This is when we as a class would create an anchor chart that can go up in the classroom. (can come back and add to this later)	Students will participate in the discussion adding their own knowledge about volume and what they know.
Activity	20 min	As the teacher we will run class leaderboard to see who's rectangular prism is actually the biggest within the classroom.	This is a hands on activity where each student (or in pairs) will be given a box they are responsible for finding the volume of the box and how much their box can hold.
Closure	15 min	This is when we would debrief that is teacher lead and we will create the formula for how we found volume and it will be added to our anchor chart to be displayed with the classroom the reference back too.	Students would be contributing to the conversation and helping to create the formula.
Exit Slip	5 min	These will take place in their math Journals.	Students will be answering reflective questions on what they learned during class and what they learned about volume.

Extensions	<p>How might the activities be extended for students who are ready for more of a challenge?</p> <p>For students who are more advanced we can challenge them to think about the surface area of the 3-D shape, and how that would relate to perimeter and volume of the shape.</p>
Adaptations	<p>How might the activities be adapted for students who need more support?</p> <p>For students who are struggling we can flip the way we are looking at the concept and they may find the volume of something else or back it up to finding area, and then stacking them up to find the volume.</p>

