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Seattle Pacific UNIVERSITY

School of Education

Service – Leadership – Competence – Character

Lesson Design Template					
Teacher Candidate	Josie Becker				
Mentor Teacher	Mrs. Anastasia Manolides				
University Coordinator	Mrs. Pat Perkins				
School	McClure Middle School				
Grade	6 th grade				
Subject	6 th Grade Honors Math				
Date	5-24-12				
1. Context for Learning – Who are the students you are teaching in this class?					
1.1 – What is the name of the course you are documenting?					
6 th Grade Honors Math					
1.2 – What is the length of the course?					
50 minutes					
1.3 – What is the class schedule?					
6 th period					
1.4 – Total number of students	30	Male	18	Female	12
1.5 – Number of students with limited English proficiency	0				
1.6 – Number of students identified as gifted and talented	All are honors students				
1.7 – Number of students with Individualized Education Plans (IEPs)	1				
1.8 – Number of students with 504 plans	1				
1.9 – Attach a chart that summarizes the required accommodations or modifications for any students that will affect your instruction of this lesson. Consult with your mentor teacher to complete the chart.					
1.10 – Describe the range of abilities in the classroom.					
Students read at 6 th grade levels or above. All are honors students so they are able to complete 6 th grade math easily and need to be taught 7 th grade materials. Several students do most math problems in their heads, this will be considered as students are asked to show work on their assignment.					
1.11 – Describe the range of socio-economic backgrounds of the students.					
The majority of students come from homes with two parents, only a few are raised by single parents. At least one parent for each child has a job. The majority of students could be labeled as “middle class” Americans.					
1.12 – Describe the racial/ethnic composition of the classroom and how you make your teaching and learning culturally responsive.					
Equality and respect permeates the teaching methodology and treatment of students. The teacher has created an atmosphere in the classroom such that it can be termed a “safety zone” where differences are respected and cultural/ethnic backgrounds are celebrated.					
1.13 – What prior knowledge, skills, and academic background do students bring to the lesson? (Consider previous learning experiences, assessment data, etc.)					
Students have had five prior lessons on the subject of probability.					
1.14 – What do you know about the students’ conversational and academic English? How do you know?					

All students possess the skills of conversational and academic English. This has been determined through direct individual conversations, answered questions, and grading class essays.
1.15 – Is there any ability grouping or tracking in the class? If so, please describe how it affects your class.
Students are assigned to specific seats. Often this is accomplished through randomization of student names. However, there are times when a low achieving student will be paired with a high achieving “leader” student who can then help guide them. In this case,
1.16 – What additional needs might students have?
If students find the general class seating area distracting, they are given the opportunity to remove themselves and sit in a designated quiet area. This area is separate from the main classroom desks by a counter space. In this case, students can determine their own needs and take advantage of the given seating options.
1.17 – Describe any district, school, grade-level, and/or cooperating teacher requirements or expectations that might impact your planning or delivery of instruction, such as required curricula, pacing plan, use of specific instructional strategies, or standardized tests, etc.
The basis for the class curriculum in the Seattle School District is “Connected Mathematics 2”.
1.18 – Describe any classroom rules, routines and/or classroom management issues that affect the lesson. How might you proactively address those issues in your lesson design?
<ul style="list-style-type: none"> a. Students are expected to enter the room, open notebooks, and begin the class by working on a launch problem. -This routine will be followed in this lesson plan as well. b. One management issue to be addressed will be the problem with students leaving their seats and walking around during classwork time. -I will clearly communicate that during classwork time, students are to choose their work partner, but then not leave their seats. To further aid this requirement, students will be asked to make sure they have all the supplies they need to complete the classwork before the time begins.
1.19 – Identify any textbook or instructional program you primarily use for instruction. If a textbook, please provide the name, publisher, and date of publication.
“Scaling and Wrapping” Connected Mathematics 2, Pearson Prentice Hall, 2006
2. Lesson Plan Explanation – Why are you teaching this lesson?
2.1 – Upon what assessment data or previous lessons are you building?
Scaling Boxes (Investigation 5) Lesson 5.1 allows students to explore the relationship between similar boxes. This lesson (5.2) goes further by exploring the relationship between the scale factor dimensions, surface area, and volume of similar boxes.
2.2 – What requisite skills do students need in order to access the lesson and participate fully?
Students must be familiar with the terms: scale factor and similarity. They must also know how to calculate the surface area and volume of a box if given its dimensions.
2.3 – How does the content build on what the students already know and are able to do?
Prior to this lesson, students will have had 5 lessons on the surface area and volume of prisms. The lesson which immediately precedes this one deals specifically with comparing dimensions, volumes, and surface areas of boxes.
2.4 – How does this lesson fit in the curriculum?
This is the second lesson in the fifth chapter of the text. The lesson uses a geometric example of boxes to compare surface areas and volume of similar boxes.

2.5 – How does this lesson build on previous lessons or previous learning?
Students will build on their knowledge of how to calculate the surface area and volume of a box if given its dimensions. Prior to this lesson, students will have had 5 lessons on the surface area and volume of prisms. The lesson which immediately precedes this one deals specifically with comparing dimensions, volumes, and surface areas of boxes. Students will also use their previous learning of informative writing to describe their classroom findings.
2.6 – How will the learning in this lesson be further developed in subsequent lessons?
After this lesson, students will continue to further their understanding of volumes and surface areas by investigating other types of prisms: cylinders, spheres, cones and pyramids.
3. Learning Targets – <i>What are the objectives for the lesson?</i>
3.1 – What is the title of your lesson?
“Scaling up the Compost Box”
3.2 – Summarize the content focus of the lesson. This summary might take the form of a “big idea” or “essential question.”
The purpose of this lesson for students to determine the relationship between the scale factor, dimensions, surface area, and volume of similar rectangular prisms.
3.3 – Cite the EALRs/standards using the numbers and text. Usually limit the lesson to 1 – 2 EALRs.
7.3. Surface area and volume (Geometry/Measurement, Algebra) (note: this is an honors class so 7 th grade standards are used)
3.4 – Cite the corresponding GLEs/performance expectations using the numbers and text.
7.3.C Describe the effect that a change in scale factor on one attribute of a two- or three-dimensional figure has on other attributes of the figure, such as the side or edge length, perimeter , area, surface area, or volume of a geometric figure.
3.5 – Cite the objectives (skills or concepts) for the lesson. What do you want students to think, know and/or be able to do at the end of the lesson? Be concrete and specific. The objectives need to be measurable. Use action verbs. They need to be aligned with the GLEs/performance expectations and EALRs/standards.
<ol style="list-style-type: none"> 1. Students will be able to determine the scale factor, surface area, and volume of a rectangular prism. 2. Students will be able to use formulas to relate scale factors, dimensions, surface areas, and volumes of rectangular prisms. 3. Students will be able to clearly articulate their understanding using formal and mathematical writing.
3.6 – Rephrase your learning targets using student-friendly language.
<ol style="list-style-type: none"> 1. Students will calculate the scale factor, surface area, and volume of a rectangular prism. 2. Students will use formulas to show how scale factors, dimensions, surface areas and volumes of boxes relate. 3. Students will write sentences using complete sentences that include formulas.
3.7 – How will students demonstrate this? Describe observable actions. – e.g. <i>Given (learning activities or teaching strategies), the students will (assessable behaviors) in order to demonstrate (connection to EALRs/Standards).</i>
<ol style="list-style-type: none"> 1. Students will calculate the scale factor, surface area, and volume of a rectangular prism and by completing the data chart. 2. Students will use formulas to show how scale factors, dimensions, surface areas and volumes of boxes relate by completing the summary sheet. 3. Students will write sentences using complete sentences that include formulas by completing

the summary sheet.
3.8 – What do you as the teacher know about this particular concept/topic etc.?
In my undergraduate career, I have had several classes on the topic of geometry, surface area, and volume, these include but are not limited to: Calculus I, II, III, and Transformational Geometry.
3.9 – Where did you find this information? (List specific resources, using APA style.)
Lappan, G., Fey, J. T., Fitzgerald, W., Friel, S. N., & Phillips, E. D. (2006). <i>Filling and Wrapping</i> (pp. 62-65). Upper Saddle River: Pearson Prentice Hall.
3.10 – Academic Language – What are the linguistic demands embedded in the learning targets? (Consider what language and literacy skills students may need to know in order to demonstrate their competency on the learning targets successfully.)
Students must have a 6 th grade reading level to work on the classwork provided in the text.
3.11 – Academic Language – What key vocabulary (content-specific terms) do you need to teach?
Students need to know the meaning of the terms: scale factor and similar prism
3.12 – Academic Language Functions – What are students doing with language to express their developing understanding of the content you are teaching?
Students will determine the surface areas and volumes of similar rectangular prisms and fill out a data chart. Students will use their found data to write a short essay using mathematically appropriate language to compare the values.
3.13 – Academic Language Forms – What words and phrases (implied grammatical features and syntactic structures) do students need in order to express their understanding of the content you are teaching? How will you teach students the relevant grammatical constructions?
Student need to understand the basic structure of a sentence. If necessary, I will review the key structural pieces with students prior to or during the time they write their essays.
3.14 – Academic Language Fluency – What opportunities will you provide for students to practice the new language and develop fluency, both written and oral?
Students will use their found data to write several sentences using mathematically appropriate language to compare the values.
4. Lesson Assessment – How will students demonstrate their learning?
Formative Assessment (Process)
4.1 – How will you know that the students are learning/working towards the learning targets?
The teacher will monitor the students as they begin to complete the data chart. As the teacher guides students in discovering the pattern relationship, the teacher will ask questions of the students to assess their understanding. The teacher will also observe students as they work on formulating their informative sentences.
4.2 – How will students demonstrate their understanding?
Students will complete the data chart provided for 6 similar rectangular prisms. Students will then use that data and the developed pattern relationships between the scale factor, surface areas, and volumes, and write informative sentences which describe these relationships.
4.3 – Describe the ways in which you will use these assessments to inform your teaching decisions during the lesson.
After introducing the concept of similar rectangular prisms, the teacher will guide students in developing a formula which relates scale factor, dimensions, surface areas, and volumes. During this time, the teacher will ask a series of leading questions to guide students in the discovery of this formula. Using these questions, the teacher will then further clarify or allow the students to begin working independently. During independent work, the teacher will formatively assess the class by observing student progress, giving prompts to students who are struggling, and answering any questions

Summative Assessment (Product)			
4.4 – In what ways will the evidence document student achievement?			
As students complete the data chart, students will be given a sheet with three written prompts. These prompts will require students to summarize their understanding of the found relationships as well as expand upon their new knowledge by applying the relationship to a general case. This assessment will be treated as homework if not completed in class.			
4.5 – How might you modify your assessment(s) for the students with whom you are working?			
The teacher will refer to the accommodations chart for general modifications. In addition, students will be allowed to work in pairs. Students will also be given extra time to complete the written assessment if necessary.			
4.6 – How will students be able to reflect upon and self-assess their learning?			
As students complete the data chart, students will be given a sheet with three written prompts.			
4.7 – To what extent are your assessments aligned with your objectives?			
The assessments are directly aligned with the objectives. Each objective is paired with a formative and summative assessment.			
4.8 – Complete the following table to highlight what the students will do to demonstrate competence specific to learning for this lesson. Consider the following questions:			
<u>Formative Assessment</u>			
<ul style="list-style-type: none"> ▪ In what ways will you monitor student learning during the lesson and how might this guide your instruction? ▪ What specific actions do you expect to observe? ▪ How will you record what you see and hear? ▪ What feedback will you provide? ▪ How will your feedback support students in meeting the learning targets? 			
<u>Summative Assessment</u>			
<ul style="list-style-type: none"> ▪ What evidence of student learning will you collect? ▪ What criteria will you use to judge whether or not your students are meeting the learning targets? ▪ What are your evaluative criteria (or rubric) and how do they measure student proficiency for your learning targets? 			
Description of <u>formative</u> assessment activity	Evaluative criteria	What the assessment is designed to assess	Feedback to students
Launch discussion	Ask questions regarding the launch exercise.	Do students understand the new definition? Do students remember the terms learned from the previous lesson? Can students calculate surface area and volume?	Affirmation at the correct surface area and volume calculations. Question how they determined their answers.
Define: Similar	Ask questions which	Question: If you have	Discussion, apply the

<p>Definition of scale factor.</p> <p>Explore: How to find a pattern?</p>	<p>require using the definition to answer.</p> <p>Question understanding of definition.</p> <p>Question, determine misconceptions.</p>	<p>two 1-2-3 boxes, are they similar? Are they equal?</p> <p>What is the scale factor of a 1-2-3 box to a 3-6-9 box? Can we compare width to height or length and get the same results?</p> <p>What happens to the volume and surface area of a box if the dimensions are doubled? (Scale factor is 2) Is that what you would have expected?</p>	<p>definition. Affirm correct answer.</p> <p>Discussion. Affirm correct responses, prompt incorrect ones. Ask how students determined their answer.</p> <p>Help students to see that volume and surface area is not just doubled. Guide through a series of prompts to find the formula.</p>
Description of <u>summative</u> assessment activity	Evaluative criteria	What the assessment is designed to assess	Feedback to students
<p>Completed data chart</p> <p>Completed written summary</p>	<ul style="list-style-type: none"> • Record scale factor • Surface area • Volume • Amount of Garbage Decomposed in a Day • Number of Worms needed <p>Is student able to use writing to communicate learning?</p>	<p>Given dimensions of a rectangular prism:</p> <ul style="list-style-type: none"> • Can a student determine the scale factor? • Can the student calculate the surface area and volume? • Can the student use the scale factor to determine volume of materials in the boxes? • Compare the scale factor and the surface area • Compare the scale factor and 	<p>Students are to work in pairs to check answers</p> <p>Assess the summary to determine the launch for the next day's lesson.</p>

		<p>the volume</p> <ul style="list-style-type: none"> • Compare the scale factor with the dimensions of any rectangular prism. 	
4.8 – <u>Academic Language</u> – Identify the linguistic demands in your assessments and how they might be modified.			
The instructions in the activity worksheet use general 6 th grade level language. If necessary, the teacher will read aloud the instructions to students who struggle with reading.			
4.9 – <u>Academic Language</u> – How is the understanding of academic language being assessed?			
Summary sentences will be collected and used to determine any misconceptions and/or confusions about academic language used by students.			
5. Instructing and Engaging Students in Learning – <i>What will happen in the lesson?</i>			
5.1 – What co-teaching strategy will be used during this lesson? <i>(if applicable, check appropriate method)</i>			
One Teach, One Observe (lead)	x	One Teach, One Drift (lead)	Station Teaching
One Teach, One Observe (observe)		One Teach, One Drift (drift)	Supplemental Teaching
Parallel Teaching		Team Teaching	Alternative Teaching
If not applicable, is this lesson during your solo time in the classroom?		Yes	No
5.2 – What learning activities do you have planned for the students? (This describes what the students do.)			
Students will write in their notebooks and complete their own individual data chart. Students will work in pairs calculate volumes and surface areas. Students will individually complete the assigned summary worksheet.			
5.3 – What instructional strategies will you use? (This describes what the teacher does.)			
The teacher will mainly act as a facilitator and will be limited in the time spent in front of the class instructing:			
<ul style="list-style-type: none"> • Guide class discussions. • Define new terms. • Walk class through example • Guide students in determining the formula for surface area and volume based on the scale factor. • Prompt struggling students during the activity • Review learned concepts • Observe learning during paired work • Ask insightful questions to encourage further understanding 			

5.4 – What opportunities will the students have to articulate the learning target(s), monitor their own progress, and identify support needed to achieve the learning target(s)?

Students will write the new definitions in their math notebooks.
Students will work in pairs to keep each other accountable during the class activity.
Students will communicate their understanding using complete sentences.

5.5 – Describe the sequence of steps in the lesson in the following table. General lesson sequences may be more directive (e.g., ITIP) or open (constructivist). Whatever design is used, the lesson needs to be explicitly outlined.

For example, an ITIP lesson sequence would include the following sequence:

- Objective & Purpose → Anticipatory Set → Input/Activity → Modeling → Check for Understanding → Guided Practice → Independent Practice

For a constructivist lesson:

- Objective & Purpose → Explore/Experiment → Hypothesize/Explain → Report/Assess

Sufficient detail is needed to see intention of the learning experiences. Consider the following questions:

- How will you communicate the learning targets to the students?
- How will you communicate your expectations to the students?
- How will you connect to your students' previous experiences?
- How will you link the lesson to their lives as students?
- What are the key teacher questions or prompts?
- What are the procedural directions for students to follow?
- How will you explicitly teach/model or demonstrate the skill/strategy/concept?
- How will you adapt the instructional procedures to meet the needs of the students whom you are teaching?
- What learning activities make up the lesson?
- What kind of examples/samples will you provide for your students?
- How will students know where the work is going and what is expected of them?
- What opportunities will you provide for students to practice this new skill/strategy?
- What questions might you pose to push student thinking and check for understanding?
- What feedback do you plan to provide?
- How might you correct student misunderstandings?
- What kind of opportunities will you provide students to apply this new learning and demonstrate mastery?
- How might students evaluate their work and its implications?

It should be clear that the learning experiences are aligned with the learning targets and assessment tasks. The sequence of lesson steps should reflect:

- Multiple approaches to learning that are responsive to the description of students provided in the *Context for Learning*.
- Research and principles of effective practice.
- A transformative multicultural perspective.
- Attempts to stimulate problem solving and critical thinking.

Complete the following table:

- Provide an estimate of time.
- List the sequence of the various learning experiences in the lesson.
- Articulate a purpose for your selection of each significant learning activity. Focus on the choice of

instructional strategies and on why significant learning experiences are chosen for student engagement. Your purpose statements can help identify evidence of effectiveness in your teaching.

Time	Learning experiences	Purpose
10min	<p>Launch:</p> <ul style="list-style-type: none"> • What is the relationship between the corresponding dimensions of the two boxes? (Compare the edges: length, width, and height) • What is the relationship between the surface areas of the two boxes? (Compare the total surface areas). • What is the relationship between the volumes of the two boxes? (Compare the total volume of each box). 	Opening activity to have students begin thinking of the relationships between dimensions, volume, and surface area.
3min	<p>Discuss answers</p> <p>Formative assessment: How did you come up with your answers?</p> <p>Recall: the 1-2-3 box from lesson 5.1.</p>	Assess students' understanding
5min	<p>Define:</p> <p>Similar</p> <p>Two rectangular prisms are similar if the ratios of the lengths of the corresponding edges are equal.</p> <p>Formative assessment: are the 1-2-3 and 2-4-6 boxes similar? Are they equal? What about a 1-2-3 box and another 1-2-3 box?</p> <p>(Ex: A 2-4-6 box is similar to a 1-2-3 box.)</p> <p>Formative Assessment: If you have two 1-2-3 boxes, are they similar? Are they equal?</p> <p>Scale Factor</p> <p>The scale factor is the number that each dimension of a rectangular prism must be multiplied by to get the dimension of a similar prism.</p>	Present students with new vocabulary

	<p>Ex: the scale factor from the 1-2-3 box to the 2-4-6 box is 2.</p> <p>Formative assessment: What is the scale factor of a 1-2-3 box to a 3-6-9 box? Can we compare width to length or height to length and get the same results?</p>	
(20min)	<p><u>Explore: Look for patterns</u></p>	<p>Discover the relationship between scale factors, dimensions, surface areas and volumes.</p>
7min	<p>Use the boxes from the launch (1-2-3, 2-4-6) then remind/recall how to find surface area, volume. Use books to verify the number of worms and compost garbage.</p>	
10 min	<p>Discuss how to find the pattern between the scale factor of a prism and its surface area and volume.</p> <p>First determine the scale factor, surface area and volume of a 1-2-3 box and then do the same for the 2-4-6 box. How do they compare? If you were to use powers of the scale factor to compare the surface area and volume, what patten arises?</p> <p>Answer: If the original surface area is SA1 and volume V1 then, The new surface area (SA2) is given by: $SA2 = SA1 * (scale\ factor)^2$</p> <p>And the new volume (V2) is given by, $V2 = V1 * (scale\ factor)^3$</p>	<p>Help students look for patterns.</p>
2min	<p>Formative assessment: if the scale factor is 2, is the volume and surface area double that of the original prism?</p>	
5min	<p>Have students fill out the chart using the formula and checking using the known formulas for volume and surface area.</p>	<p>This provides an opportunity for students to see the pattern work for multiple examples.</p>
8 min or (homework)	<p>Summarize (Write to review/demonstrate understanding) Have students write answers to the following questions in</p>	<p>Demonstrate understanding.</p>

	<p>complete sentences using the formulas they developed.</p> <p>B. How is the change in surface area from a 1-2-3 box to a similar box related to the scale factor from the 1-2-3 box to the similar box? Suppose the compost box has a top. Will your answer change? Explain in 2-3 sentences.</p> <p>C. How is the change in volume from a 1-2-3 box to a similar box related to the scale factor from the 1-2-3 box to the similar box? Explain in 2-3 sentences.</p> <p>E. Suppose the scale factor between the 1-2-3 box and a similar box is N. Describe the dimensions, surface area, and volume of the similar box in 2-3 sentences.</p> <p>Review answers. Discuss where the patterns come from.</p>	
5.6 – Closure – How will the key points of the lesson be articulated?		
<p>Key terms will be written on the board. The discovered formula will also be written on the board. The teacher will observe pairs as they work and guide them if necessary.</p>		
5.7 – Closure – What questions or prompts will you use to elicit student articulation of their progress towards the attaining the learning target(s)?		
(See worksheet questions)		
5.8 – Closure – How will students rethink and revise their understanding and work?		
<p>Students will rethink their work and understanding through the summary worksheet. Students will be able to rethink their work as the worksheet is used for future launch questions.</p>		
5.9 – Materials – What materials, including community resources and educational technology, will you need in order to teach this lesson?		
<ul style="list-style-type: none"> • Whiteboard and markers or Doc-Cam • 2 boxes made of graph paper: 1-2-3 and 2-4-6 • Completed data chart • Attached pages of “Scaling Up the Compost Box” • Attached Summary Worksheet 		
5.10 – Materials – What materials will students need for this lesson?		
<ul style="list-style-type: none"> • Notebooks and pencils • Attached blank worksheet • Individual copy of pages from “Filling and Wrapping” • 		
5.11 – Grouping of students for learning – How will student learning groups be formed?		
<p>Students will be allowed to choose their own pairs.</p>		

5.12 – <u>Management and Safety Issues</u> – Are there management and/or safety issues (physical and/or emotional) that need to be considered when teaching this lesson? If so, list them. What will you do to prepare your students for these issues?
As students pair up for the completion of the data chart, there is a potential safety issue as all students change seats. But as our classroom rules specify, we walk without touching others and at a safe speed in the classroom, so this potential issue will not need to be further addressed.
5.13 – <u>Family involvement</u> – Describe any family involvement that accompanies this lesson. If the lesson does not explicitly require family involvement, then describe how the lesson fits in with the family involvement plan for the unit. Letting parents know how the student is doing in the course may also be part of the plan
Families will receive feedback on their student’s grade via the school wide grade book. In addition, the purpose and objectives of this lesson, along with the entire unit has been communicated to families in my quarterly newsletter. Direct parent communication will occur if any behavioral issues come up from individual students.
6. Analysis of Student Work – <i>What was the positive impact of your teaching?</i>
Choose three samples of student work representing the full range of student performance. To the extent possible, at least one of these must be from an English language learner and one from a student who represents a particular teaching challenge related to your expectations for this lesson. The third is a sample of your choice.
6.1 – What kind(s) of feedback did you give the students?
As I observed students completing the data chart and summary sentences, I noticed identified problem areas which were then used to inform the teacher of the next day’s launch activity. In determining the areas of confusion, the teacher reviewed these concepts the next day.
6.2 – How did your feedback encourage students to monitor their own progress and identify support needed to achieve the learning targets?
The next day’s launch and review encouraged students in correcting misconceptions or affirming their knowledge of the learning targets.
6.3 – For each work sample, discuss what it illustrates about the students’ developing skills and understandings of the academic content as well as growth in academic language. Consider the following questions: <ul style="list-style-type: none"> ▪ To what extent did each student learn what you had intended them to learn? ▪ Did he/she meet the learning targets? How? Why? Cite specific evidence from the sample collected. ▪ What do these samples tell you about each of the students in relationship to the EALR/Standard of focus for this lesson? ▪ In what areas did each of the students have difficulty? Why? ▪ Were the adaptations/accommodations to the lesson appropriate for each of the students? How? Why? ▪ Was the assessment appropriate for these students? How? Why? ▪ Are there aspects of the student’s learning that you observed that are not well represented in the samples? Explain.
The students in first period did not learn the targets very well. There explore activity took much longer than expected and the students were not given enough guidance to find the formula of the new surface area and volume. The students in sixth period were able to learn the targets much better due to a reformatting of the explore part of the lesson. With more guided practice, the students were, for the

most part, able to understand the formula.

Sample 1: Lilly (period 1)

Lilly was able to meet the learning targets of determining the surface area and volume of a rectangular prism based on the scale factor. However, Lilly did not quite meet the target of clearly articulating her learning through writing.

Sample 2: Eleanor (period 1)

Eleanor was able to demonstrate her understanding of determining the surface area and volume of a rectangular prism in one example. However, based on her third answer, it is clear that she does not understand that the formula can be applied to all prisms of any scale factor. Eleanor was able to articulate her answers through writing decently well, but needs to work on her formal writing.

Sample 3: Chad (period 6)

Chad's work shows that he has met the target of articulating through writing. He also understands the formula for surface area based on the scale factor. However, Chad has some misconceptions about how the scale factor relates to volume.

Sample 4: William (period 6)

William uses good sentence structure and demonstrates he can articulate through writing well. He also provides all the correct formulas and demonstrates that he fully comprehends the learning targets by providing an example.

- These samples reveal whether or not students understand the relationship between scale factors, dimensions, surface areas, and volumes.
- Three of the four students had difficulty applying the formulas for volume and surface area to a prism with "n" dimensions. Two of the students had sentences that were either incomplete or not clear.
- The few students who needed accommodations were able to fully participate in this lesson. Extra time was given to those who needed it and one student used his specialized calculator to fill out the chart.
- The assessment was appropriate for the students and showed where there were problem areas so that the teacher could address them the next day.

7. Retrospective Reflection – *What did you learn about your teaching and student learning during this lesson?*

7.1 – Was the lesson taught as planned? If not, what changes were made to the lesson and why?

The first period I taught this lesson, it did not go as planned. I had hoped that the students would be able to determine the pattern/formulas for surface area and volume on their own and have more time to work on the writing assignment. For this reason, I changed the lesson for 6th period (lesson written above). I worked with the students as described in the above lesson to determine the formulas. Then using the formulas, the students filled out the data chart. In this way, students were able to spend more time on the writing assignment and work to articulate their knowledge rather than spend all their time looking for patterns.

7.2 – To what extent did the whole class or group learn what you intended them to learn? Cite specific examples and/or evidence. This could include student work, mentor teacher observation notes, video, etc.
<p>The first period class did not learn all that I intended. For this reason, the teacher will spend more time in review the next day. The sixth period class accomplished each of the activities outlined in the lesson, and the majority of them demonstrated understanding of the learning targets in their worksheets.</p> <p>(See attached student work)</p>
7.3 – What did you learn about your students as learners?
I learned that timing is crucial. As 6 th grade learners, they need to be well guided through discovery based learning. Formulas and reasoning needs to be communicated in multiple ways. Additionally, writing to demonstrate learning works well as a summative assessment.
7.4 – What other forms of feedback could you have used? Why?
I could have used an exit ticket and had the students write one thing that confused them about the lesson. This would have given them more of a voice.
7.5 – What will be your next steps instructionally? Why?
Instructionally, the next step will be to apply these same concepts to other prisms like cones and pyramids. These are next as they are more complex prisms but will follow similar rules.
7.6 – Do you have data to supports these next steps? Explain.
The same text introduces these next steps. Additionally, the OSPI standards follow this order.
7.7 – The next time that you teach this material to a similar group of students, what changes, if any, might you make in planning, instruction and assessment?
The next time I teach this lesson, I will spend more time guiding the student through the discovery part of the lesson. I will also be more specific with my written assessment and clarify as to the desired formal writing.
7.8 – How would the changes improve the learning of students with different needs and characteristics?
These changes would provide a better structure for students with different needs and characteristics. With a clearer structure and instructions, students would have a better perception on how to be successful.
7.9 – What have you learned about yourself as a teacher?
I have learned that I need to work on my timing as a teacher. When planning, I should allow for more time for students to do writing in the class. In this way, I can better formatively assess and correct before mistakes are made.
7.10 – What goals do you have for yourself as you plan future lessons?
In future lesson plans, I will allow for more time spent on class work and less on instruction. I will also be careful to be very specific in my instruction on assignments.