LESSON PLAN (REVISED 2020)
Secondary Years

Candidate's name: Rebekah Johnston

Grade/Subject:	Math 8	School	PGSS
Date	Nov 27, 2020	Allotted Time	2h 40mins
Topic: squares and square roots			
Cross-Curricular Connections:			

PART 1: PLANNING

Rationale/Pre-Assessment:
Why these students at this time in this way? What is the background knowledge of students to support this learning?
- Grade 7: students learn operations with integers, decimals, and relationships between decimals, fractions, ratios, and percents.

Due to COVID, the students may not have gained a full understanding of these concepts. The first few days this quarter will be a review of the concepts covered in Math 7. We have reviewed area, factors, prime numbers, and squares. We have reviewed all concepts covered in the "get ready" section including factors, perimeter/area, and numbers between.

Today we are beginning to work from the textbook, looking at section 1.2. This covers the Pythagorean theorem.

Big Ideas: https://curriculum.gov.bc.ca/ (Curriculum)
What are students expected to understand? How is this lesson connected to the Big Ideas?
- Number represents, describes, and compares the quantities of ratios, rates, and percents.

Students will understand factors, squares, and square roots, and the Pythagorean theorem.

Core Competencies: https://curriculum.gov.bc.ca/competencies (refer to "profiles" for some ideas)
Which sub-core competencies will be the focus of this lesson? Briefly describe how and why:

C Communication	T Thinking	PS Personal and Social
• Communicating • Collaborating	• Creative Thinking • Critical & Reflective Thinking	• Personal Awareness & Responsibility • Positive Personal & Cultural Identity • Social Awareness & Responsibility
I participate in conversations for a variety of purposes (e.g., to connect, help, be friendly, learn and share). I listen and respond to others. Students will communicate with the teacher using a daily back and forth question/comment sheet. They will spend the first week getting to know the teacher and	**I can ask questions, make predictions, and use my senses to gather information. I can explore with a purpose in mind and use what I learn. I can tell or show others something about my thinking. I can contribute to and use simple criteria.** Students will use their critical thinking skills to reflect on past	

the teacher getting to know the students. Students will communicate their thoughts and ideas about subject matter via class discussion, individual and group work.	learning. They will make connections between squares and square roots and the Pythagorean theorem.	

First Peoples Principles of Learning (FPPL):

How will Indigenous perspectives, knowledge & ways of knowing be acknowledged, honoured or integrated into this learning experience? (Jo Chrona's Blog: https://firstpeoplesprinciplesoflearning.wordpress.com/)

FPPL to be included in this lesson:	How will the FPPL be embedded in lesson:
Learning takes patience and time.	Understanding that learning is about understanding concepts and the application of knowledge, rather than only memorization of information. We will be revisiting concepts multiple times in many ways to provide students with opportunities to deepen their knowledge and understanding.
Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place).	I will try to help the students see the relevancy in what they are learning. This will be a cooperative and collaborative learning opportunity. There will be multiple ways for students to represent their learning. I strive to include as much experiential, authentic learning opportunities as possible.

Learning Standards: https://curriculum.gov.bc.ca/ (Curriculum) – *What will be assessed and evaluated?*

Curricular Competencies: *What are students expected to do?*	Content: *What are students expected to learn?*
- **Use reasoning and logic to apply math** - **Use tools to explore relationships** - **Use play, inquiry, and problem solving** - **Reflect on mathematical thinking** - **Use mathematical vocabulary and language to contribute to mathematical discussions**	- **Perfect squares and square roots** - **Pythagorean theorem**

Assessment Plan:

Opportunities for feedback, self-assessment, peer assessment and teacher assessment. What structures or rubrics will you use to evaluate student learning? Include the assessment tool used (e.g., Performance Standard Quick Scale).

FORMATIVE ASSESSMENT: Students will write a quiz at the beginning of class which I will collect, mark and hand back on Monday. They will work with protractors to discover the difference between acute, obtuse, and right angles which they will demonstrate via a worksheet. They will draw and cut out squares with side lengths of 3, 4, and 5 which they will use to create a right-angle triangle. I will circulate and check the shape of the triangle they create.

SUMMATIVE ASSESSMENT: Chapter test at the end of the chapter will cover the Pythagorean theorem

The Learning Intention: *What will students learn in this lesson? (i.e. Learning Standards)*	The Pythagorean theorem How to use various tools to discover the Pythagorean relationship
Evidence of Learning: *How will students demonstrate their learning? What does it look like?*	Students will complete textbook questions to demonstrate their understanding of the Pythagorean theorem. They will complete a worksheet covering the different types of angles. Students will participate in class discussions and will ask questions. They will complete an exit slip where they will draw a right triangle and correctly label the Pythagorean relationship.
Criteria: *What do students need to do to meet or achieve the learning intention?*	Students must correctly show they can use the Pythagorean relationship to find the length of a missing side on a right triangle.

Planning for Diversity:

What is the Learning Target? *In what ways does the lesson meet the needs of diverse learners?* *How will you plan for students who have learning/behavior difficulties or require enrichment?*		
Students need to/must do	**Students can do**	**Students could do/try to**
Draw a right triangle and be able to identify acute vs obtuse triangles. Students must cut out squares from grid paper with pre-determined side lengths and arrange then to form a right triangle in the middle. Access/All	Draw right triangles, arrange squares to form a right triangle in the center and understand the relationship of the two smaller squares equal the biggest square. Complete textbook questions to reinforce this idea Most	Complete the textbook questions and the extension worksheet that solves for the side lengths of the triangle through process of elimination. Few/Challenge

Resources, Materials, and Technology Preparation: *What resources, materials and preparation are required?*

PART 2: TEACHING

Teacher Activities:	**Student Activities:**	**Pacing**

Before Lesson: *Post and/or explain agenda of class; post the Core Competencies or FPPL; post the learning intentions; etc.* - Welcome students - Have students put their backpacks at the back of the room	- **Students settle in, put backpacks at the back**	
Motivator/Start of Lesson: *How will you introduce this lesson in a manner that engages students and activates their thinking/connections to prior knowledge?* - Tell students they will be writing a quiz on the topics we have covered so far. - Ask if they have any specific questions they want to go over, if not have sample ones ready to go	- **Ask and clarifying questions and participate in review**	10 min
- Hand out quiz and have students complete it individually	- **Complete the quiz individually**	20 min
- **Hand back name tents and have students respond to the question after they are done their quiz**	- **Answer the question and place name tent back on the front of the desk**	
During Lesson: - Discuss different types of triangles, obtuse, acute, and right angle - Hand out angles worksheet and protractors, have students find the angles	- **participate in discussion about triangles, using protractors to identify acute vs obtuse angles**	20 min
- Hand out grid paper and have students get out scissors, have them draw squares with a side length of 3, 4, and 5, show me before they start cutting	- **draw and cut out the three squares**	25 min
- Once they have their squares cut out, have them create a right-angle triangle in the center	- **arrange the squares so the inside forms a right-angle triangle**	
- Ask students to look for a relationship between the squares, maybe have them calculate the areas to see if that helps (we are looking for them to notice that 9+12=25 - (go off of ex.1 on page 15 showing $a^2+b^2=c^2$)	- **try to notice a relationship by finding the areas of the squares**	
- Have students complete textbook questions 1-4 on page 17	- **complete textbook questions** - **1.2 pg 17 #1-4**	15 min
- Show students the Pythagorean relationship by using example 1 on page 15, show how the areas of the smaller two squares add to be the same number as the area of the hypotenuse square.	- **participate in discussion about the Pythagorean relationship**	15 min

- Show how you can determine whether a triangle is a right angle or not by checking if the Pythagorean relationship is true, have students cut out squares with side lengths of 7 and 9, have them see how it doesn't make a right angle with any of the other three squares they have	- **cut out more squares and arrange them to have the inside form a triangle, notice that it is not a right angle**	15 min
- Show how to check if it is a right angle by adding the area of the two smaller triangles and seeing if the sum is equal to the area of the biggest square (ex2 on pg 16)	- **participate in discussion about determining a right triangle based on the areas of the squares**	10 min
Activities to apply learning: **Review/Summary** Have students pack up with 10 minutes left in class so they can fill out an exit slip describing the Pythagorean relationship in their own words and draw a triangle that fits the criteria **Closure:**	**clean up and fill out the exit slip**	10 min

PART 3: REFLECTION

How did the learning go? How do you know what to teach next? In what ways are the learners informing you about the next steps?

<u>Lesson Planning Guide</u>   (adapted from Thompson Rivers University)

The lesson plan template is designed as a guide for students to use when planning lessons. The plan may be adapted to specific subject areas and modified as students gain experience or to suit their presentation style. The template is a basic outline that can be used directly as printed or expanded from the electronic version. It is important that the lesson plan be sufficiently clear and detailed so that another teacher could use the plan to teach the lesson.

Rationale*: Why are you teaching this particular lesson at this time? One consideration is the context for the lesson (e.g. this introductory lesson determines what students know and want to know about the topic, this lesson relates to previous and future learning by ……)   Another consideration is student motivation (e.g. what are some reasons the learner might care about the content/concepts/ skills for future learning, careers, or interests?).*

Curricular Connections:
The curriculum asks you to plan what the students will DO, what they will KNOW, and then what they will UNDERSTAND. ***Big ideas*** *capture the "big picture" or general area of learning (e.g. inter-dependence of living things with the environment, stories are a source of creativity and joy) and will be what students come to UNDERSTAND.* ***Curricular competencies*** *are what students will DO in their learning activities (e.g. using comprehension strategies, sorting and classifying data, making ethical judgments) that are related to each discipline. The* ***learning standards for content or concepts*** *are a more specific consideration of what students will come to KNOW. Many of the standards are written in broad, general terms to allow flexibility. You can, using the intention of the standard, make it clearer and more specific (e.g. learners will be able to describe the main idea in a paragraph or story, learners will be able to classify leaves based on properties they identify).   The lesson should make a connection to both types of learning standards – curricular competencies as well as content. A reminder that the direction of new curriculum has identified core competencies of thinking, communication, and personal / social development as a foundation for all curricula.*

Learning Intentions: *How can you make clear and share with your learners what they are going to learn or have learned or accomplished? Statements like: "I can add two fractions" help frame their learning in positive student language.*

Prerequisite Concepts and Skills: *What concepts and skills are needed for students to be successful? This communication helps connect lessons together in a logical sequence by building/scaffolding new knowledge onto previous learning. For example, if students are going to be engaged in debate did you build or scaffold group work strategies, communication skills, expected etiquette, criteria beforehand?*

Materials and Resources */****References***   *List all materials and resources that you and the students will need. What things do you need to do before the lesson begins? (e.g. prepare a word chart.) What things do the students need to do? (e.g. read a chapter in the novel.) Have you honoured the sources of ideas or resources? Disorganized materials can ruin a great lesson.*

Differentiated Instruction (DI): (accommodations):   *How will you accommodate for diverse learners in your class?   How will you allow for some variety in expression of learning?   How can you modify the learning activities for success? How can you provide engaging extra challenges for those that are ready? How might you alter the learning environment if needed? Have you considered Aboriginal and cultural influences?   IEP's?*

Assessment and Evaluation: *Did the students learn what you taught them? What tools might you use for assessment (e.g. check list, rubric, anecdotal record). How will you provide formative feedback to students about their learning?   The results of the assessment should be directly connected to what your students were able to write say or do related to the learning intentions and or curriculum.   Strive for accuracy and build assessment into teaching and learning and not as an "add on" at the end.*

Organizational/Management Strategies: *Have you thought-out organizational management strategies to facilitate a proactive positive classroom environment?   Some examples are: organizing for movement, distributing and collecting materials, grouping strategies, blended grade classroom logistics.*

Aboriginal Connections / First Peoples Principles of Learning: *Are there any connections to Aboriginal or other cultural knowledge, worldviews, or principles of learning?*
<u>Lesson Activities/Structure:</u>
Connect*: How will you get students interested/motivated/ hooked into learning? How will you connect this lesson to past and future lessons? How can you share the learning intentions in student friendly language? How will you provide a lesson overview?*
Process*: What sequence of activities will the student's experience? What will you do? What will they do?   Estimate how much time will each activity take (pacing)?   What are grouping/materials strategies?   There are many ways to describe the body (step by step, two columns dividing student and teacher activities, visual flow chart of activities and connections, others?)*
Transform*: How will students apply and personalize the learning? What will they do or create to show you that they have learned?*
Closure: *How will the lesson end?   (e.g. connecting back to learning intentions, summarizing learning, sharing of accomplishments, connecting to next lessons). Google "40 ways to close a lesson."*

Reflections*: Complete the reflections section as soon as possible after teaching the lesson. What went well? What revisions would you make to the lesson?   Anything else****?***