

Big Idea 1: Proportional Comparison

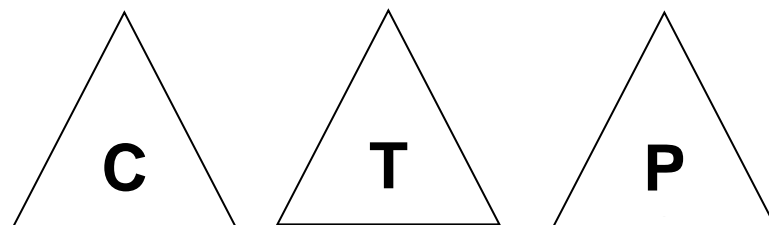
Absolute Value Publications: Foundations and Pre-Calc 10, Mathlinks 10, Mathpower 10,	Date Created: Aug 27, 2017 Timeframe: 9 classes
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BIG IDEA (Understand)

Generalizations and Principles: What Students will understand.

Proportional comparisons can be made among right triangles, using trigonometry.

CORE COMPETENCIES (See Appendix I)



C: Communication T: Thinking PS: Personal & Social Competency

CONTENT (Know)

- primary trigonometric ratios

DRIVING QUESTIONS

How is the nature of Mathematics reflective of the truth, beauty and goodness of God's love for mankind in the creation of the universe? (CE1, FP1)

What role do the basic trigonometric ratios play in construction, aviation, physical sciences and sports?

CURRICULAR COMPETENCIES (Do)

- Reasoning and analyzing***
- Use reasoning and logic to analyze and apply mathematical ideas
 - Estimate reasonably
 - Model mathematics in contextualized experiences
- Understanding and solving***
- Develop, demonstrate, and apply conceptual understanding of mathematical ideas
 - Visualize to explore and illustrate mathematical concepts and relationships
 - Apply flexible strategies to solve problems in both abstract and contextualized situations
 - Engage in problem-solving experiences that are connected to place, story, cultural practices, and perspectives relevant to local First Peoples communities, the local community, and

other cultures

Communicating and representing

- Communicate mathematical thinking in many ways
- Use mathematical vocabulary and language to contribute to mathematical discussions
- Represent mathematical ideas in a variety of ways
- Explain and justify mathematical ideas

Connecting and reflecting

- Reflect on mathematical thinking
- Use mathematics to support personal choices
- Connect mathematical concepts to each other and to other areas and personal interests
- Incorporate First Peoples worldviews and perspectives to make connections to mathematical concepts

Time Frame (Days/ Lesson Title)	Content (Key Elements)	Students Will Be Able To (SWBAT)	Learning Opportunities	Practice
First Week (2 days)	Course Intro and Expectations	<ul style="list-style-type: none"> • Students will learn about classroom expectations and course expectations as described in course outline and ask questions to clarify their understanding • Students will engage in team building activities to get to know other members of the classroom community • Students will complete general logistics to get started on the course (i.e. workbook distribution, seating plan) 	<ul style="list-style-type: none"> • Assign seating plan for the course to learn student names quickly • Ask students to participate in ice-breaker activity to get them working on skills that will be used throughout the course. The activity will involve critical thinking, problem solving, group work and presentation. • Discuss classroom and course expectations, and address any questions students may have at that time • Assign and record textbook distribution and give 	Course outline Moodle resources Seating chart

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			an overview of the materials used in the course.	
Opening class – end of unit	Central theme	<ul style="list-style-type: none"> Students will explore and identify examples of God's truth, beauty and goodness in the universe and identify parallels with mathematical truths they have encountered and will encounter in this unit (CE1, FP1) 	<ul style="list-style-type: none"> Opening Teaser: Why Catholics Have So Many Reasons to Smile. https://lifeteen.com/blog/catholics-many-reasons-smile/ Use this as the introduction to the course, so students can identify the truths in their identity as children of God. What are some of the points you relate to in this article. Read Lifeteen blog on Truth: https://lifeteen.com/blog/truth/ Create a T-column table connecting the truths in the Catholic church as per the article and in second column write down Mathematical truths which the students come up with. Students will update this T-column table throughout the unit as they discover more trigonometric ratio truths and how these truths are used to help them with problem-solving. Ask the students how the truths of our Catholic faith help us to be rationale problem solvers 	T-column chart comparing Mathematical truths to Catholic truths
Day 1	Intro to trigonometric ratios	<p>Explain the relationships between similar right triangles and the definitions of the primary trigonometric ratios.</p> <p>Identify the hypotenuse of a right triangle and the opposite and adjacent sides for a given acute angle in the triangle.</p>	<ol style="list-style-type: none"> Students explore trigonometric ratios in class and illustrate how they can be used to solve problems involving similar triangles. Model the labeling of sides of the triangles: opposite, adjacent and hypotenuse. Students practice labeling of triangles with worksheets given Students explore introduction to trig ratios. Assign practice questions. 	Day 1: Lesson 1 & <i>triangle worksheet</i>
Day 2	Trigonometry	Students will be able to recognize	1. Review some practice questions.	Supplies:

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	: introduction Tan, Sine and Cosine ratios	trigonometric ratios: Sine, Cosine and Tangent <ul style="list-style-type: none"> • SWBAT identify the sides in a triangle as: opposite, adjacent and hypotenuse. 	<ol style="list-style-type: none"> 2. Assess student learning from previous lesson. 3. Review key terms in a triangle: opposite, adjacent and hypotenuse. 4. Students explore different tools for measuring lengths and angles of similar triangles (i.e. software, protractor, rulers) 5. Activity: students measure lengths of opp, adj, and hyp. Introduce the tangent ratio as measurement of the opposite side and adjacent side of one angle. Record tangent ratio in a table. Teacher introduces the calculator in finding TAN value of the angle. Compare the table of results with calculator value of TAN. 6. Repeat activity with SIN and COS. 7. Students work with examples from HW with teacher and peer assistance. 8. Assign practice questions. 	Class set of protractors, rulers Trigonometry unit Day 2: Lesson 2
Day 3,4	Using trig ratios: Sin, Cos, Tan, to calculate side length, or measure of angle for a right triangle	Student will be able to: Solve right triangles, with or without technology. Solve a problem that involves one or more right triangles by applying the primary trigonometric ratios or the Pythagorean theorem.	<ol style="list-style-type: none"> 1. HW check and corrections 2. Assess student learning from previous lesson. 3. Students explore application of trig ratios in problem solving involving: SIN, COS and TAN ratios. 4. Students explore problem solving involving missing sides and missing angles to a right triangle using their calculator and knowledge of sum of angles in a triangle and trig ratios. Introduce mnemonic: SOH CAH TOA to help students remember the trig ratios. 5. Students work through examples with teacher and peer feedback. 6. Assign practice questions. 	Trigonometry unit Day 3: Calc side length Lesson 3 Day 4: Calc measure of angle Lesson 4
Day 5,6,7	Solving Right Triangles, Area of	Solve right triangles, with or without technology.	<ol style="list-style-type: none"> 1. HW check and corrections 2. Assess student learning from previous lesson. 3. Students explore problems involving right angle 	Trigonometry unit

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	Triangle and problems involving right triangles	Solve a problem that involves one or more right triangles by applying the primary trigonometric ratios or the Pythagorean theorem.	triangles. Find missing angle or lengths in a triangle using trig ratios or Pythagorean theorem. 4. Students work in pairs to verify and provide peer feedback. 5. Assign practice questions.	Day 5: Solving Triangle Lesson 5 Day 6: Applications of Trig Lesson 6 Day 7: Solving Problems with Right Triangles Lesson 7
Day 8	Review	SWBAT to solve review questions for Unit test • To assess the SAI's, teacher will facilitate discussions, observation of student work and dialogue between peers, and give practice questions in the form of review questions and/or quizzes where applicable.	1. Check/Review homework corrections 2. Use chapter review as a unit pretest. Mark in-class next day.	Practice test at end of unit
Day 9	Unit Assessment	Demonstrate the curricular competencies in this unit.	1. Complete unit assessment	Unit Assessment