UbD: Geometry - Right Triangle Trigonometry

<table>
<tr><td>Time Frame: 11 Lessons</td><td>Unit 4: Right Triangle Trigonometry</td><td>Course Name: Geometry</td></tr>
<tr><td colspan="3">Stage 1: Desired Results</td></tr>
<tr><td>Established Goal(s)</td><td colspan="2">Transferable Skills</td></tr>
<tr><td rowspan="4">Standards Addressed:

HSG-GMD.A.1 Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.
HSG-MG.A.3 Apply geometric methods to solve design problems
HSG-SRT.B.5 Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
HSG-SRT.C.6 Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.
HSG-SRT.C.7 Explain and use the relationship between the sine and cosine of complementary angles.
HSG-SRT.C.8 Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.
HSN-Q.A.2 Define appropriate quantities for the purpose of descriptive modeling.
HSN-Q.A.3 Choose a level of accuracy appropriate to limitations on</td><td colspan="2">Students will be able to independently use their learning to...

● define trigonometric ratios and solve problems involving right triangles.
● apply trigonometry to general triangles.
● apply mathematical knowledge, skill, and reasoning to solve real-world problems.
● develop clear and effective communication.
● increase self-direction.
● develop creative and practical problem-solving.
● develop informed and integrative thinking..</td></tr>
<tr><td colspan="2">Meaning</td></tr>
<tr><td><u>Understandings</u>
Students will understand that...
● they can define trigonometric ratios and solve problems involving right triangles.
● they can apply trigonometry to general triangles.
● math is a continuum, Algebra is needed for Geometry, and math concepts will build on themselves as we develop our mathematical understandings.</td><td><u>Essential Questions</u>
● How can we use trigonometry to solve real-world problems involving right triangles?
● How might trigonometry be used in land surveying or navigation?</td></tr>
<tr><td colspan="2">Acquisition</td></tr>
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measurement when reporting quantities.	*Students will know...* ● that one acute angle in a right triangle determines the ratio of the side lengths. ● how to find the side lengths of triangles with 45 45 and 90° angles. ● how to find the side lengths of triangles with 30 60 and 90° angles. ● how to build a ratio of side lengths of right triangles. ● how to use table ratios of sidelines of right triangles to estimate unknown side lengths. ● how to use cosine sine and tangent to find side lengths of right triangles. ● how to use cosine sine and tangent to find the height of an object. ● how to explain why sin(A)=cos(90-A) ● how to use arc cosine arc sign and arc tangent to find measures in right triangles. ● how to use trigonometry to solve problems ● how to define and correctly use the glossary terms: complementary, cosine, sine, tangent, trigonometric ratio, arccosine, arcsine, and arctangent.	*Students will be able to...* ● use angles to determine steepness. ● relate 45°,45°, and 90° triangles to half a square. ● relate half of an equilateral triangle to a 30°, 60°, and 90° triangle. ● work with ratios in right triangles. ● work with trigonometric ratios. ● apply ratios and right triangles. ● relate sine and cosine in the same right triangle ● use trigonometric ratios to find angles. ● solve problems with trigonometry. ● use trigonometry to approximate pi. ● define and use geometry-specific vocabulary words that were introduced in this unit. Mathematical Practices: ● make sense of problems and persevere in solving them. ● reason abstractly and quantitatively. ● construct viable arguments and critique the reasoning of others. ● model with mathematics. ● use appropriate tools strategically. ● attend to precision. ● look for and make use of structure. ● look for and express regularity in repeated reasoning.