Pre-Calculus L2 - Unit E - Applications of Trigonometric Functions

Unit Focus

This unit will cover solving right and oblique triangles using Trigonometry. Right triangles will be solved using right triangle trigonometry and oblique triangles will be solved using the Law of Sines or the Law of Cosines. Students will apply these concepts to "real world" problems. Area will also be covered in this unit.

Stage 1: Desired Results - Key Understandings

Standard(s)

Common Core
Mathematics: 9-12

- Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. (CCSS.MATH.CONTENT.HSN.Q.A.1)
- Define appropriate quantities for the purpose of descriptive modeling. (CCSS.MATH.CONTENT.HSN.Q.A.2)
- Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (CCSS.MATH.CONTENT.HSN.Q.A.3)
- Interpret expressions that represent a quantity in terms of its context. (CCSS.MATH.CONTENT.HSA.SSE.A.1)
- Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. (CCSS.MATH.CONTENT.HSG.SRT.C.8)

- Make sense of problems and persevere in solving them. (CCSS.MATH.MP.1)
- Reason abstractly and quantitatively. (CCSS.MATH.MP.2)
- Construct viable arguments and critique the reasoning of others. (CCSS.MATH.MP.3)
- Model with mathematics. (CCSS.MATH.MP.4)
- Attend to precision. (CCSS.MATH.MP.6)

Madison Public Schools Profile of a Graduate

- Analyzing: Examining information/data/ evidence from multiple sources to identify possible underlying

Transfer

Students will be able to independently use their learning to...
T1 draw conclusions about graphs, shapes, equations, or objects.
T2 demonstrate fluency with math facts, computation and concepts.
T3 make sense of a problem, initiate a plan, execute it, and evaluate the reasonableness of the solution.
T4 apply familiar mathematical concepts to a new problem or apply a new concept to rework a familiar problem.

Meaning

Understanding(s)

Students will understand that...
U1 Mathematicians identify relevant tools, strategies, relationships, and/or information in order to draw conclusions.
U2 Mathematicians create dependable arguments by calculating efficiently and accurately.
U3 Mathematicians apply the mathematics they know to solve problems occurring in everyday life.
U4 Mathematicians analyze characteristics and properties of geometric shapes to develop mathematical arguments about geometric relationships.

Essential Question(s)

Students will keep considering...
Q1 Does this solution make sense?
Q2 How can I break a problem down into manageable parts?
Q3 What math tools/models/ strategies can I use to solve the problem?
Q4 What is the most efficient way to solve this problem?
Q5 How does classifying bring clarity?

Acquisition of Knowledge and Skill

Knowledge

Students will know...
K1 several Pythagorean Triplets
K2 the relationship within special right triangles (45-45-90 and 30-60-90)

Skill(s)

Students will be skilled at...
S1 solving right triangles using Trigonometry
S2 solving application problems using right triangle Trigonometry

Stage 1: Desired Results - Key Understandings		
assumptions, patterns, and relationships in order to make inferences. (POG.1.2) • Collective Intelligence: Working respectfully and responsibly with others, exchanging and evaluating ideas to achieve a common objective. (POG.3.1)	**K3** SohCahToa **K4** the Law of Sines **K5** the Law of Cosines **K6** Hero's or Heron's Formula for area of a triangle **K7** A=0.5absin(<C) **K8** Vocabulary: oblique, ambiguous, elevation, depression	**S3** solving triangles using the Law of Sines including AAS, ASA and SSA cases **S4** determine whether there are 0,1, or 2 triangles for a given set of measurements **S5** solving oblique triangle applications with Law of Sines and Law of Cosines **S6** solving triangles using the Law of Cosines including SAS and SSS cases **S7** solving application problems involving area of triangles