Unit #2 Similarity and Trigonometry

Content Area: **Math**
Course(s):
Time Period:
Length: **8 weeks**
Status: **Published**

State Mandated Topics Addressed in this Unit

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N/A	N/A

Similarity and Trigonometry

Learning Objectives

- Objective 1 - Verify experimentally the properties of dilations given by a center and a scale factor: A dilation takes a line not passing through the center of the dilation to a parallel line and leaves a line passing through the center unchanged.
- Objective 2 - Verify experimentally the properties of dilations given by a center and a scale factor: The dilation of a line segment is longer or shorter in the ratio given by the scale factor.
- Objective 3 - Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.
- Objective 4 - Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.
- Objective 5 - Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
- Objective 6 - Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.★

Essential Skills

- Essential Skill 1 - Verify properties of dilation given a center and scale factor.
- Essential Skill 2 - Verify properties of dilation given a center and scale factor. Scale factor determines the ratio.
- Essential Skill 3 - Given two figures: Use definitions of Similarity to determine if transformations are similar
- Essential Skill 4 - Explain similarity of triangles using equalities of corresponding pairs of angles AND proportionality of corresponding pairs of sides

- Essential Skill 5 - Use properties of similarity transformations to establish that AA criterion is enough to determine if two triangles are similar
- Essential Skill 6 - Use congruency and similarity for triangles to prove relationships in geometric figures.
- Essential Skill 7 - Use trigonometric ratios to solve right triangle applied problems. Use the Pythagorean Theorem to solve right triangles.

Standards

MATH.9-12.G.SRT.A.1.a	A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.
MATH.9-12.G.SRT.A.1.b	The dilation of a line segment is longer or shorter in the ratio given by the scale factor.
MATH.9-12.G.SRT.A.2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.
MATH.9-12.G.SRT.A.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.
MATH.9-12.G.SRT.B.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
MATH.9-12.G.SRT.C.8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

Instructional Tasks/Activities

- G.GPE.B.6 snotes.ws12.prac.docx - Directed Line Segments
- G.SRT.A.1 Activity #1 – Dilating a Picture
- G.SRT.A.1 Activity #2 – Perspective Drawing
- G.SRT.A.1 Activity #3 – Money & Currency Exchange
- G.SRT.A.1 Dilation Practice Problems with Graphing
- G.SRT.A.1 snotes.ws1.docx - Dilation Properties
- G.SRT.A.1 snotes.ws2.prac.docx - Enlargement/Contraction & Scale Factors
- G.SRT.A.1 snotes.ws4.prac.docx - Centers of Dilations
- G.SRT.A.1 snotes.ws5.prac.docx - Dilation & Coordinates
- G.SRT.A.1 snotes.ws6.prac.docx - Construct a Dilation
- G.SRT.A.1 Worksheet #2 - Enlargement/Contraction & Scale Factor
- G.SRT.A.1 Worksheet #3 - Dilating Lines
- G.SRT.A.1 Worksheet #4 - Centers of Dilations
- G.SRT.A.1 Worksheet #5 - Dilations & Coordinates
- G.SRT.A.1 Worksheet #6 - Construct a Dilation
- G.SRT.A.1snotes.ws3.prac.docx - Dilating Lines
- G.SRT.A.1Worksheet #1 - Dilation Properties

- G.SRT.A.2 snotes.ws2.prac.docx - Proportions
- G.SRT.A.2 snotes.ws2.prac.docx - Similarity Transformations
- G.SRT.A.2 snotes.ws3.prac.docx - Similarity Solving
- G.SRT.A.2 Worksheet #1 - Proportions
- G.SRT.A.2 Worksheet #2 - Similarity Transformations
- G.SRT.A.2 Worksheet #3 - Similarity Solving
- G.SRT.A.3 snotes.ws1.docx - Similarity Criterion
- G.SRT.A.3 snotes.ws2.prac.docx - Identifying Similarity
- G.SRT.A.3 snotes.ws3.prac.docx - Proving Similarity
- G.SRT.A.3 Worksheet #1 - Similarity Criterion
- G.SRT.A.3 Worksheet #2 - Identifying Similarity
- G.SRT.A.3 Worksheet #3 - Proving Similarity
- G.SRT.B.4 snotes.ws1.guide.docx - Proportional Parts
- G.SRT.B.4 snotes.ws2.prac.docx - Solving Proportional Parts
- G.SRT.B.4 Worksheet #1 - Proportional Parts
- G.SRT.B.4 Worksheet #2 - Solving Proportional Parts
- G.SRT.B.5 Activity #1 – Finding the Geometric Means
- G.SRT.B.5 Activity #2 – Constructing the Special Right Triangles
- G.SRT.B.5 snotes.ws1.prac.docx - Geometric Mean
- G.SRT.B.5 snotes.ws2.prac.docx - Special Right Triangles
- G.SRT.B.5 Worksheet #2 - Special Right Triangles
- G.SRT.C.6 Activity #1 – What is Trigonometry?
- G.SRT.C.6 snotes.ws12.prac.docx - Trigonometry Introduction
- G.SRT.C.6 Worksheet #0 - A Trigonometry Table
- G.SRT.C.6 Worksheet #2 - Trigonometry Introduction
- G.SRT.C.7 snotes.ws1.prac.docx - Co - Functions (Sine & Cosine)
- G.SRT.C.8 snotes.ws123.prac.docx - Solving Trig Problems
- G.SRT.C.8 snotes.ws4.prac.docx - More Complex Trig Problems
- G.SRT.C.8 Worksheet #1 - Solving Trig. Problems
- G.SRT.C.8 Worksheet #3 - Trigonometry Word Problems
- G.SRT.D.10 snotes.ws.56.prac.docx - Law of Cosines
- G.SRT.D.10 snotes.ws1234.prac.docx - Law of Sines
- G.SRT.D.11 snotes.ws1.prac.docx - Applications for Laws of Sines and Cosines
- G.SRT.D.9 snotes.ws1.prac.docx - Area (Sine)
- G.SRT.D.9 Worksheet #1 - Area (Sine)

Assessment Procedure

- Classroom Total Participation Technique

- Classwork
- DBQ
- Essay
- Exit Ticket/Entrance Ticket/Do Now
- Journal / Student Reflection
- Kahoot
- Other named in lesson
- Peer Review
- Performance
- Problem Correction
- Project
- Quiz
- Rubric
- Teacher Collected Data
- Test
- Test Review
- Worksheet

Recommended Technology Activities

- Appropriate Content Specific Online Resource
- Appropriate Content Specific Online Resource
- Gimkit
- GoGuardian
- Google Classroom
- Google Docs
- Google Slides
- Google Slides
- Kahoot
- MagicSchool AI
- Other- Specified in Lesson
- Quiziz
- Screencastify

Accommodations & Modifications & Differentiation

Accommodations and Modifications should be used to meet individual needs. Their IEP and 504 plans should be used in addition to the following suggestions.

Gifted and Talented

- Compare & Contrast
- Conferencing
- Debates
- Jigsaw
- Peer Partner Learning
- Problem Solving
- Structured Controversy
- Think, Pair, Share
- Tutorial Groups

Instruction/Materials

- alter format of materials (type/highlight, etc.)
- color code materials
- eliminate answers
- extended time
- extended time
- large print
- modified quiz
- modified test
- Modify Assignments as Needed
- Modify/Repeat/Model directions
- necessary assignments only
- Other (specify in plans)
- other- named in lesson
- provide assistance and cues for transitions
- provide daily assignment list
- read class materials orally
- reduce work load
- shorten assignments
- study guide/outline
- utilize multi-sensory modes to reinforce instruction

Environment

- alter physical room environment

- assign peer tutors/work buddies/note takers
- assign preferential seating
- individualized instruction/small group
- modify student schedule (Describe)
- other- please specify in plans
- provide desktop list/formula

Honors Modifications

Resources

- http://geometrycommoncore.com
- https://education.ti.com/en/timathnspired/us/standards-search
- https://www.engageny.org/resource/high-school-geometry