Updated August 2024

Marking Period	Unit Title	Recommended Instructional Days
2	Right Triangles and Trigonometry	15-20

Domain: Geometry

NJSLS Strand:

Key:

Major Cluster
Supporting Cluster
Additional Cluster

G.SRT.B.4: Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.

G.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.

G.SRT.C.7: Explain and use the relationship between the sine and cosine of complementary angles.

G.SRT.C.8: Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. ⋆

Progress Indicator:
Tests ● Quizzes ● Practice problems for homework ● Online textbook ● Worksheets ● Leveled assessments

Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-CLKS within Unit

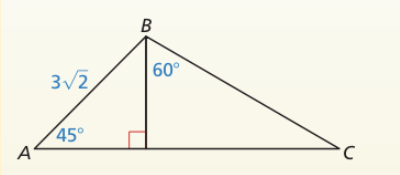
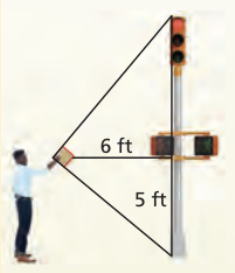
Essential Questions:

1. **How are similarity in right triangles and the Pythagorean Theorem related?**
2. **How do trigonometric ratios relate angle measures to side lengths of right triangles?**
3. **How can the Law of Sines be used to determine side lengths and angle measures in acute and obtuse triangles?**
4. **How can the Law of Cosines be used to determine side lengths and angle measures in acute and obtuse triangles?**
5. **How can trigonometry be used to solve real-world and mathematical problems?**

Activity Description:

- **The Pythagorean Theorem**
- **Special Right Triangles**
- **The Tangent Ratio**
- **The Sine and Cosine Ratios**
- **Solving Right Triangles**

Interdisciplinary Connections:
Topic 8 Project
Measure a Distance
Trigonometry is a powerful tool for measuring lengths and distances indirectly. You and your classmates will use trigonometry and indirect measurement to find the height of an object that is too tall to measure directly.

G.SRT.D.9 (+): Derive the formula A = 1/2absinC for the area of a triangle by drawing an auxiliary line from the vertex perpendicular to the opposite side. ***G.SRT.D.10 (+): Prove the Law of Sines and Law of Cosines and use them to solve problems.*** ***G.SRT.D.11 (+): Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).***		Career Readiness, Life Literacies and Key Skills **Content: Engineering; Construction. NJSLS#: G.SRT.C.6, G.SRT.C.7, G.SRT.D.11) (Next Generation Science Standards ETS1-2)** **Spot Light On:** **Climate** This lesson plan will allow you to teach introductory statistics through a linear regression assignment. The lesson plan includes a hands-on computer-based classroom activity to be conducted on a dataset of Global Temperature Anomalies (1850-2017). This activity includes a set of inquiry-based questions that will enable your students to apply their understanding of scatter plots, regression equations, correlation coefficients, linear regression, and confidence intervals for slopes. Thus, the use of this lesson plan allows you to integrate the teaching of a climate science topic with a core topic in Mathematics. **Example Tasks:** **Task 1:** Find the area and perimeter of △ABC.  **Task 2:** Use the information in the diagram to find the height of the traffic light. 

<table>
<tr><td></td><td></td><td>Task 3:
The angle of elevation from the bottom of a fence to the top of a tree that is 4 feet from the fence is 75°.
a. How tall is the tree?
b. The angle of elevation from the bottom of the fence to the first limb on the tree is 62°. How high is the limb?
c. The angle of elevation from the top of the fence to the top of the tree is 70°. How tall is the fence?</td></tr>
<tr><td colspan="2">Mathematics Practices</td><td rowspan="4"></td></tr>
<tr><td colspan="2">1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reason of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.</td></tr>
<tr><td>Social and Emotional Learning:
Competencies</td><td>Social and Emotional Learning:
Sub-Competencies</td></tr>
<tr><td>Self- awareness

Social Awareness

Self- Management

Relationship Skills</td><td>Recognizing the importance of self-confidence in handling daily tasks and challenges.
Demonstrate an awareness of the expectations for social interactions in a variety of ways.</td></tr>
</table>

Responsible Decision-Making	Demonstrate an understanding of the need for mutual respect when viewpoints differ. Recognize the skills needed to establish and achieve personal and educational goals. Utilize positive communication and social skills to interact effectively with others. Develop, implement, and model effective problem solving and critical thinking skills.	

Assessments (Formative) ***To show evidence of meeting the standard/s, students will successfully engage within:***	**Assessments (Summative)** ***To show evidence of meeting the standard/s, students will successfully complete:***
Formative Assessments: ● Entry and Exit Slips ● Quizzes ● Self Assessments	**Benchmarks:** ● Chapter Tests ● Projects ● LinkIT **Summative Assessments:** ● District Assessments ● Midterms ● Standardized Tests

Differentiated Student Access to Content:
Teaching and Learning *Resources/Materials*

Core Resources	**Alternate Core Resources** ***IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core Resources**
● Textbooks websites ● Achieve the core ● Khan Academy ● Desmos ● GeoGebra	● Skill building worksheets ● Math Manipulatives	● Dictionary for native languages ● Videos in their native language.	● Leveled Assessments ● Enrichment worksheets

Supplemental Resources
Technology: ● **Chromebooks, Graphing Calculators, Online math manipulatives** **Other:** ● **Zoom and Google Meets, Schoology, Interactive Textbooks, Private Tutoring**

Differentiated Student Access to Content: Recommended *Strategies & Techniques*			
Core Resources	**Alternate Core Resources** *IEP/504/At-Risk/ESL*	**ELL Core Resources**	**Gifted & Talented Core**
● **Deliver instruction utilizing varied learning styles including audio, visual, and tactile/kinesthetic, provide individual instruction as needed, modify assessments and/or rubrics, repeat**	● **Utilize a multi-sensory (VAKT) approach during instruction, provide alternate presentations of skills by varying the method (repetition, simple explanations, additional examples, modeling, etc.), modify test content and/or format, allow students to retake test for additional credit, provide additional times and preferential seating as needed, review, restate and repeat directions, provide study guides, and/or break assignments into segments of shorter tasks.**	● **Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental materials including use of an online bilingual dictionary, and modified assessment and/or rubric.**	● **Create an enhanced set of introductory activities, integrate active teaching/learning opportunities, incorporate authentic components, propose interest-based extension activities, and connect student to related**

NJSLS CAREER READINESS, LIFE LITERACIES & KEY	**Disciplinary Concept: Creativity and Innovation**	
	Core Ideas:	**With a growth mindset, failure is an important part of success**
	Performance Expectation/s:	**9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).**

SKILLS	Career Readiness, Life Literacies, & Key Skills Practices
	Act as a responsible and contributing community member and employee. **Attend to financial well-being.** **Consider the environmental, social and economic impacts of decisions.** **Demonstrate creativity and innovation.** **Utilize critical thinking to make sense of problems and persevere in solving them.** **Model integrity, ethical leadership and effective management.** **Plan education and career paths aligned to personal goals.** **Use technology to enhance productivity, increase collaboration and communicate effectively.** **Work productively in teams while using cultural/global competence.**

New Jersey Legislative Statutes and Administrative Code (place an "X" before each law/statute if/when present within the curriculum map)									
	Amistad Law: *N.J.S.A. 18A 52:16A-88*		Holocaust Law: *N.J.S.A. 18A:35-28*		LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*		Diversity & Inclusion: *N.J.S.A. 18A:35-4.36a*	**X**	Standards in Action: *Climate Change*