**Geometry in Construction UNIT 3 Lesson Plans**

**Day 60**

1) Lesson: Scaffolding Safety

2) Classwork: Subfloor Framing

3) Classwork: Subfloor Blocking

4) Classwork: Subfloor Squaring and Decking

5) Classwork: Wall Erecting

6) Classwork: Strapping

7) Classwork: Trusses - Installing and Bracing

8) Classwork: Sheathing Exterior Walls

9) Classwork: Install Fascia Header Board

10) Classwork: Install Fascia

11) Classwork: Decking the Roof

**Day 61**

1) Lesson:Ratio of Size of Similar Right Triangles

*Objective:* The students will explore the side lengths of similar right triangles to see how the ratio of their sides do not change.

2) Activity: Staircase and ramp construction comparison. Students will relate each step length and height to the total staircase length and height

3) Lesson: Introduction to Trigonometry

*Objective:* The students will look at similar triangles and set up ratios for sine, cosine, and tangent. Students will explore the relationship between the angle measures and the trigonometric ratios.

3) Classwork: Basic Trigonometry W.S.

[CCSS.MATH.CONTENT.HSG.SRT.C.6](http://www.corestandards.org/Math/Content/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.

[CCSS.MATH.CONTENT.HSG.SRT.C.7](http://www.corestandards.org/Math/Content/HSG/SRT/C/7/)
Explain and use the relationship between the sine and cosine of complementary angles.

**Day 62**

1) Classwork: Subfloor Framing

2) Classwork: Subfloor Blocking

3) Classwork: Subfloor Squaring and Decking

4) Classwork: Wall Erecting

5) Classwork: Strapping

6) Classwork: Trusses - Installing and Bracing

7) Classwork: Sheathing Exterior Walls

8) Classwork: Install Fascia Header Board

9) Classwork: Install Fascia

10) Classwork: Decking the Roof

**Day 63**

1)Lesson: Solving Right Triangles Using Trigonometry

*Objective:* The students will use trigonometry to find missing side lengths of a right triangle

2)Activity: The students will apply construction concepts to finding missing sides of right triangles in terms of roofs, stairs, ramps, etc.

3)Activity:The students will use an inclinometer to find the heights of objects throughout the building

4) Classwork: Solving Triangles Using Trigonometry W.S.

[CCSS.MATH.CONTENT.HSG.SRT.C.8](http://www.corestandards.org/Math/Content/HSG/SRT/C/8/)
Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

**Day 64**

1) Classwork: Subfloor Framing

2) Classwork: Subfloor Blocking

3) Classwork: Subfloor Squaring and Decking

4) Classwork: Wall Erecting

5) Classwork: Strapping

6) Classwork: Trusses - Installing and Bracing

7) Classwork: Sheathing Exterior Walls

8) Classwork: Install Fascia Header Board

9) Classwork: Install Fascia

10) Classwork: Decking the Roof

11) Classwork: Install Drip Edging

12) Classwork: Roofing Felt

**Day 65**

1) Lesson: Angles of Elevation & Depression

*Objective:* Students will define an angle of elevation & depression in problem solving settings

2) Activity: Students will create drawings based on application problems using angles of elevation and depression. Students will solve problems using trigonometry.

3) Lesson: Inverse Trigonometry

*Objective:* The students will use inverse trigonometry to find the angle of depression and elevation in their right triangle drawings

3) Classwork: Find angles based on drawings in previous activity

4) Classwork: Angle of Elevation & Depression Worksheet

[CCSS.MATH.CONTENT.HSG.SRT.C.8](http://www.corestandards.org/Math/Content/HSG/SRT/C/8/)
Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

**Day 66**

1) Classwork: Subfloor Squaring and Decking

2) Classwork: Wall Erecting

3) Classwork: Strapping

4) Classwork: Trusses - Installing and Bracing

5) Classwork: Sheathing Exterior Walls

6) Classwork: Install Fascia Header Board

7) Classwork: Install Fascia

8) Classwork: Decking the Roof

9) Classwork: Install Drip Edging

10) Classwork: Roofing Felt

**Day 67**

1) Activity: Crossing the River; students will use trigonometry to determine the length across a river.

2) Classwork: Construction & Trigonometry W.S. - students will solve problems determining if certain constructions meet regulations for angles and ratios.

3)Assessment: The students will be assessed on trigonometry learning targets

[CCSS.MATH.CONTENT.HSG.SRT.C.8](http://www.corestandards.org/Math/Content/HSG/SRT/C/8/)
Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

**Day 68**

1) Classwork: Subfloor Squaring and Decking

2) Classwork: Wall Erecting

3) Classwork: Strapping

4) Classwork: Trusses - Installing and Bracing

5) Classwork: Sheathing Exterior Walls

6) Classwork: Install Fascia Header Board

7) Classwork: Install Fascia

8) Classwork: Decking the Roof

9) Classwork: Install Drip Edging

10) Classwork: Roofing Felt

11) Classwork: Shingles

**Day 69**

1)Review: Students will review trigonometry concepts and Law of Sines & Law of Cosines in applied problems

2) Activity: Students will use known lengths from Google Maps and trigonometry with Law of Sines & Cosines to find unknown lengths and angles

3)Classwork: Law of Sines & Cosines Activity W.S.

[CCSS.MATH.CONTENT.HSG.SRT.C.8](http://www.corestandards.org/Math/Content/HSG/SRT/C/8/)
Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

[CCSS.MATH.CONTENT.HSG.SRT.D.10](http://www.corestandards.org/Math/Content/HSG/SRT/D/10/)
(+) Prove the Laws of Sines and Cosines and use them to solve problems.

[CCSS.MATH.CONTENT.HSG.SRT.D.11](http://www.corestandards.org/Math/Content/HSG/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).

**Day 70**

1) Classwork: Wall Erecting

2) Classwork: Strapping

3) Classwork: Trusses - Installing and Bracing

4) Classwork: Sheathing Exterior Walls

5) Classwork: Install Fascia Header Board

6) Classwork: Install Fascia

7) Classwork: Decking the Roof

8) Classwork: Install Drip Edging

9) Classwork: Roofing Felt

10) Classwork: Shingles

**Day 71**

1) Activity: Water Balloon Launch; the students will use previously constructed water balloon launcher to launch balloons, determine angle measures, and create angles of launch.

[CCSS.MATH.CONTENT.HSG.SRT.C.8](http://www.corestandards.org/Math/Content/HSG/SRT/C/8/)
Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

**Day 72**

1) Classwork: Sheathing Exterior Walls

2) Classwork: Install Fascia Header Board

3) Classwork: Install Fascia

4) Classwork: Decking the Roof

5) Classwork: Install Drip Edging

6) Classwork: Roofing Felt

7) Classwork: Shingles

**Day 73**

1) Lesson: Area of a Triangle Using Trigonometry

 *Objective:* The students will derive the formula for a triangle (1/2bcsinA) and use it in problem solving situations.

2) Activity: Students will perform an exploration activity in which they will discover the formula for area of a triangle.

3) Activity: Students will apply the formula to various construction, area, and volume problems.

4) Classwork: Trigonometry with Area & Volume W.S.

[CCSS.MATH.CONTENT.HSG.SRT.D.9](http://www.corestandards.org/Math/Content/HSG/SRT/D/9/)

(+) Derive the formula *A* = 1/2 *ab* sin(C) for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.

**Day 74**

1) Classwork: Sheathing Exterior Walls

2) Classwork: Install Fascia Header Board

3) Classwork: Install Fascia

4) Classwork: Decking the Roof

5) Classwork: Install Drip Edging

6) Classwork: Roofing Felt

7) Classwork: Shingles

**Day 75**

1) Review & Enrichment: Review or provide enrichment for students based on previous assessments

**Day 76**

1) Classwork: Classwork: Install Drip Edging

2) Classwork: Roofing Felt

3) Classwork: Shingles

**Day 77**

1)Assessment: Students will be assessed on Unit 3 Learning Targets

2) Construction