Curriculum Sample Template

Max. 8 Pages

Grade Level	10th Grade	**Content Area**	Mathematics
Course Title (grades 9-12 Only)	Geometry		
Expected Prior Knowledge *The knowledge/skills mastered earlier in the year foundational to the mastery of the required Standard in the current sample.*	Students are expected to have prior knowledge of and/or skills mastered to: G-SRT.6 , G.SRT.8 Find the length of a side of a special right triangle. G-SRT.1, G.SRT.2, G.SRT.3, G.SRT.4, G.SRT.5 Determine the similarity of two figures.		
Alignment to Program of Instruction *Briefly outline methods of instruction found in this sequence of lessons that align to the Program of Instruction described in A.3.*	Mathematics lessons focus on problem solving, critical thinking, and practical applications. Direct Instruction includes lecture (structured overview), small-group (peer partners), and teacher-directed (guided overview) learning activities. Formative assessments include didactic questioning, visual presentation of direct instruction, Cornell Notes and graphic organizers, summaries and reflections, and collaborative activities. Summative assessments designed for student mastery of content.		
Standard Number and Description *List the Number* and the full description for the Required Standard or Science Performance Objective listed in section A.6.*	G-SRT.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.		
Materials/Resources Needed	Pencils, Paper, Spiral Notebook (Math Dictionary), Scientific Calculator		

* ***Standard Number****: For English Language Arts (Reading and Writing), use Grade, Strand, Standard (e.g., 3.RI.2). For K-8 Math, use Grade, Domain, Standard (e.g., 6.EE.7). For HS Math, use Conceptual Category-Domain, Standard (e.g., A-REI.6). For Science, use Grade, Strand, Concept, PO (e.g., 4.1.3.1).*

Lesson (add as needed)	**Instructional Strategies**	**Student Activities**
1	**Similarity in Right Triangles** 1. Teacher will review warm-up problems to assess prior knowledge and provide re-teaching assignments as needed. 2. Teacher will introduce key vocabulary: altitude, vertex, hypotenuse, geometric mean. 3. Teacher will present structured overview of (a) the Proof of Theorem 8-1-1; (b) the geometric mean of two positive numbers; (c) the Proof of Theorem 8-1-2; and (d) the Proof of Theorem 8-1-3. 4. Teacher will present guided instruction to: (a) write a similarity statement comparing the three triangles; (b) find the geometric mean of a pair of numbers and provide answer in simplest radical form; and (c) find side lengths of right triangles.	1. Students will access prior knowledge by completing warm-up problems for: (a) writing similarity statements com-paring two triangles; (b) simplifying radical expressions; and (c) solving equations by multiplying or dividing. 2. Students will document key vocabulary and meanings in their Math Dictionary. 3. Students will take Cornell Notes for (a) the Proof of Theorem 8-1-1; (b) the geometric mean of two positive numbers; (c) the Proof of Theorem 8-1-2; and (d) the Proof of Theorem 8-1-3. 4. Students will work with peer partner to solve problems for each concept, after it is presented in guided instruction. (see Instructional Strategies 4a-c) 5. Students will complete four-six practice problems for each concept presented in the lesson. (see Instructional Strategies 4a-c)
2	**Similarity in Right Triangles** 1. Teacher will review guided instruction for similarity in right triangles. **Trigonometric Ratios** 1. Teacher will review warm-up problems to assess prior knowledge and provide re-teaching assignments as needed. 2. Teacher will introduce key vocabulary: trigonometric ratio, sine, cosine, tangent 3. Teacher will present structured overview of (a) the trigonometric ratio of two sides of a right triangle and (b) the definition, symbols, and diagram of sine, cosine, and tangent.	1. **Summative Assessment:** Students will complete Similarity in Right Triangles Quiz. 2. **Summative Assessment:** Students will complete Similarity in Right Triangles Mathematical Applications. 1. Students will access prior knowledge by completing warm-up problems for: (a) converting fractions to decimals and round to the nearest hundredth and (b) solving equations by multiplying or dividing. 2. Students will document key vocabulary and meanings in their Math Dictionary. 3. Students will take Cornell Notes for (a) the trigonometric ratio of two sides of a right triangle and (b) the definition, symbols, and diagram of sine, cosine, and tangent.
3	**Trigonometric Ratios** 1. Teacher will present guided instruction to: (a) write each	1. Students will work with peer partner to solve problems for each

	trigonometric ratio as a fraction and as a decimal rounded to the nearest hundredth; (b) find trigono-metric ratios in special right triangles; (c) use calculator to find each trigonometric ratio and round to the nearest hundredth; and (d) use trigonometric ratios to find side lengths of right triangles and round to the nearest hundredth.	concept, after it is presented in guided instruction. (see Instructional Strategies 1a-d) 2. Students will complete four-six practice problems for each concept presented in the lesson. (see Instructional Strategies 1a-d)
4	**Trigonometric Ratios** 1. Teacher will review guided instruction for trigonometric ratios.	1. **Summative Assessment:** Students will complete Trigonometric Ratios Quiz. 2. **Summative Assessment:** Students will complete Trigonometric Ratios Mathematical Applications.

Summative Assessment Items: *Attach here.* For each summative assessment item, include an answer key or scoring rubric describing how points are to be awarded.

1. **Similarity in Right Triangles Quiz:** Assessment is scored on a 75 point scale, each question is worth 5 points and partial credit may be given. Students will score 60 out of 75 points (80%) to demonstrate mastery.
2. **Similarity in Right Triangles Mathematical Applications:** Assessment is scored on a 20 point scale, each question is worth 5 points and partial credit may be given. Students will score 16 out of 20 points (80%) to demonstrate mastery.*
3. **Trigonometric Ratios Quiz:** Assessment is scored on a 45 point scale, each question is worth 5 points and partial credit may be given. Students will score 36 out of 45 points (80%) to demonstrate mastery.
4. **Trigonometric Ratios Practical Applications:** Assessment is scored on a 25 point scale, each question is worth 5 points and partial credit may be given. Students will score 20 out of 25 points (80%) to demonstrate mastery.*

*assessment independent from instruction

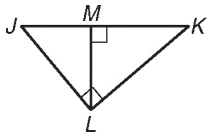
For each summative assessment item, partial credit will be awarded as follows:

5 points for correct answer and writing of ALL mathematical calculations required to solve item.
4 points for correct answer and writing of SOME but not ALL mathematical calculations required to solve item.
3 points for correct answer and no writing of mathematical calculations required to solve item.
2 points for incorrect answer and writing of ALL mathematical calculations required to solve item.
1 point for incorrect answer and writing of SOME but not ALL mathematical calculations required to solve item.
0 points for incorrect answer and no writing of mathematical calculations required to solve item.

Similarity in Right Triangles Quiz

Score: _____

Write a similarity statement comparing the three triangles in each diagram.

1. 

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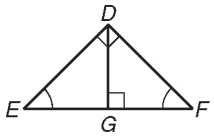
2. 

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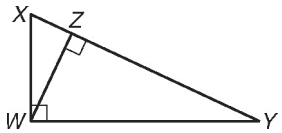
3. 

_____

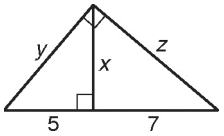
Find the geometric mean of each pair of numbers and answer in simplest radical form.

4. $\frac{1}{4}$ and 4 _____

5. 3 and 75 _____

6. 4 and 18 _____

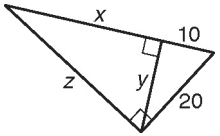
Find *x*, *y*, and *z*.

10. 

X=_____

Y=_____

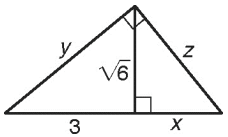
Z=_____

11. 

X=_____

Y=_____

Z=_____

12. 

X=_____

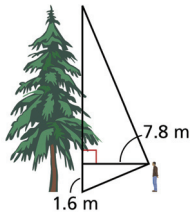
Y=_____

Z=_____

Similarity in Right Triangles Mathematical Applications

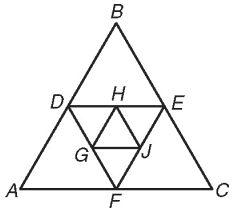
Score: _____

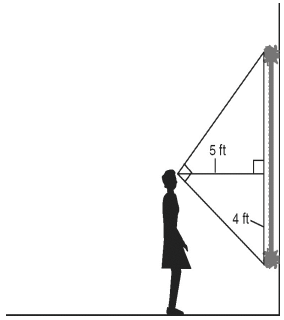
1. To estimate the height of a Douglas fir, Jan positions herself so that her lines of sight to the top and bottom of the tree form a 90º angle. Her eyes are about 1.6 m above the ground, and she is standing 7.8 m from the tree. What is the height of the tree to the nearest meter? (Let x be the height of the tree.) _____



2. A sculpture is 10 feet long and 6 feet wide. The artist made the sculpture so that the height is the geometric mean of the length and the width. What is the height of the sculpture to the nearest tenth of a foot? _____

3. The perimeter of $\triangle ABC$ is 56.4 cm and the perimeter of $\triangle GHJ$ is 14.1 cm. The perimeter of $\triangle DEF$ is the geometric mean of these two perimeters. What is the perimeter of $\triangle DEF$? _____



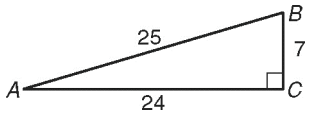


4. Tamara stands facing a painting in a museum. Her lines of sight to the top (5 feet) and bottom (4 feet) of the painting form a 90° angle. How tall is the painting? _____

Trigonometric Ratios Quiz

Score: _____

Use the figure for Questions 1–3. Write each trigonometric ratio as a simplified fraction and as a decimal rounded to the nearest hundredth.



1. sin *A* _____

2. cos *B* _____

3. tan *B* _____

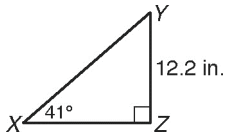
Use a calculator to find each trigonometric ratio. Round to the nearest hundredth.

4. sin 64° _____

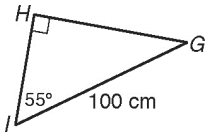
5. cos 58° _____

6. tan 15° _____

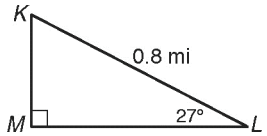
Find each length. Round to the nearest hundredth.

7. 

XZ _____

8. 

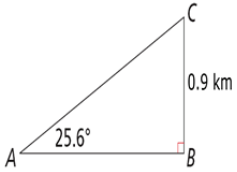
HI _____

9. 

KM _____

Trigonometric Ratios Mathematical Applications

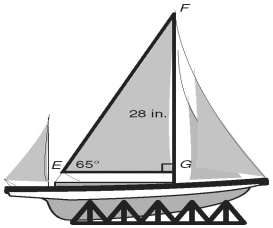
Score: _____



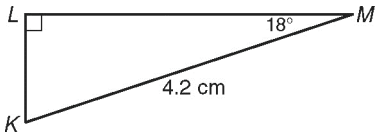
1. The Pilatusbahn in Switzerland is the world's steepest cog railway. Its steepest section makes an angle of about 25.6º with the horizontal and rises about 0.9 km. Use the sketch for question 1a.
   a. What side length represents the answer? _____
   b. How long is this section of the railway track? _____
      (Round to nearest hundredth)

2. A ramp is used to load a 4-wheeler onto a truck bed that is 3 feet above the ground. The angle that the ramp makes with the ground is 32°. What is the horizontal distance covered by the ramp? (Round to the nearest hundredth.) _____

3. What is *EF*, the measure of the longest side of the sail on the model? (Round to the nearest inch.) _____



4. Find the perimeter of the triangle below. (Round to the nearest hundredth.) _____



Similarity of Right Triangles Quiz Answer Key

1. Possible answers: $\triangle JKL \sim \triangle JLM \sim \triangle LKM$
2. Possible answers: $\triangle DEF \sim \triangle GED \sim \triangle GDF$
3. *Possible answers:* $\triangle WXY \sim \triangle ZXW \sim \triangle ZWY$
4. *1* 5. 15
6. $6\sqrt{2}$ 7. $\sqrt{35}; 2\sqrt{15}; 2\sqrt{21}$
8. 30; $10\sqrt{3}$; $20\sqrt{3}$
9. 2; $\sqrt{15}$; $\sqrt{10}$

Similarity of Right Triangles Mathematical Applications Answer key

1. 40 m
2. 7.7 ft
3. 28.2 cm
4. 10 ¼ ft

Similarity of Right Triangles Quiz Answer Key

1. $\frac{7}{25}$; 0.28
2. $\frac{7}{25}$; 0.28
3. $\frac{24}{7}$; 3.43
4. 0.90 5. 0.53
6. 0.27 7. 14.03 in
8. 57.36 cm 9. 0.36 mi

Similarity of Right Triangles Quiz Answer Key

1a. AC
1b. 2.08 km
2. 4.80 ft
3. 31 in
4. 9.49 cm