West Linn–Wilsonville School District

Mathematics – Course Statement

Course Title: Geometry

Length of Course:	Year
Number of Credits:	1
Grade Level:	9, 10, 11, 12
Prerequisites:	Placement by previous math teacher or Algebra

Date of Description/Revision: 2013

Course Overview	

Geometry is the study of the three-dimensional space in which we live. Students will learn to interpret and draw three-dimensional objects, solve problem situations with geometric models, and apply properties of and relationships between figures. Students will be given the opportunity to enhance their algebra skills as they make the connections between algebra and geometry. Students will develop their three-dimensional visualization through class discussion, demonstrations, and discovery.

Essential Questions	Concepts providing focus for student learning

- What is Euclidean Geometry? Why did Euclid base his geometry on several main assumptions? What is non-Euclidean geometry?

- What is logical reasoning and how does one apply it in making and proving conjectures?

- What is measurement? What is area? What is volume? How are area, perimeter, and volume related?

- What are the properties of 1, 2, and 3-dimensional geometric figures? How does one determine if two shapes are similar? Congruent? What are the properties of similarity and congruency? What is right triangle trigonometry and how is it helpful in measurement of our world?

Proficiency Statements	

Upon completion of course, students will be able to:

- Make and test conjectures, formulate counter-examples, follow logical arguments, construct arguments and discuss the validity of those arguments.

- Communicate mathematical ideas using appropriate mathematical language and symbolism.

- Indirectly measure 1-, 2- and 3-dimensional geometric figures.

- Determine if two geometric figures are similar, congruent or neither.

- Use sine, cosine and tangent to solve right triangles.

- Use coordinate geometry in their analysis and proofs of geometric figures.

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Course Standards/Units		
Units	**Includes Standards Clusters**	**Mathematical Practice Standards**
Unit 1 Congruence, Proof, and Constructions	• Experiment with transformations in the plane • Understand congruence in terms of rigid motions • Prove geometric theorems • Make geometric constructions	Make sense of problems and persevere in solving them. Reason abstractly and quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics. Use appropriate tools strategically. Attend to precision Look for make use of structure. Look for and express regularity in repeated reasoning.
Unit 2 Similarity, Proof, and Trigonometry	• Understand similarity in terms of similarity transformations • Prove theorems involving similarity • Define trigonometric ratios and solve problems involving right triangles. • Apply geometric concepts in modeling situations. • Apply trigonometry to general triangles	
Unit 3 Extending to Three Dimensions	• Explain volume formulas and use them to solve problems. • Visualize the relation between two-dimensional and three-dimensional objects • Apply geometric concepts in modeling situations	
Unit 4 Connecting Algebra and Geometry through Coordinates	• Use coordinates to prove simple geometric theorems algebraically • Translate between geometric descriptions and the equation for a conic section	
Unit 5 Circles With and Without Coordinates	• Understand and apply theorems about circles • Find arc lengths and areas of sectors of circles • Translate between the geometric description and the equation for a conic section • Use coordinates to prove simple geometric theorem algebraically • Apply geometric concepts in modeling situations	
Unit 6 Applications of Probability	• Understand independence and conditional probability and use them to interpret data • Use the rules of probability to compute probabilities of compound events in a uniform probability model • Use probability to evaluate outcomes of decisions	

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Above table adopted from: National Governors Association Center for Best Practices & Council of Chief State School Officers. (2010). *Common Core State Standards for Mathematics.* Washington, DC: Authors.

Resources	

- Text: *Geometry*, Glencoe McGraw-Hill, 2010