MAJOR CONTENT

The student solves problems involving the Major Content for the course with connections to the Standards for Mathematical Practice.

Major Content				
Content	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
Congruence Transformations GM: G-CO.B.6 LEAP.I.GM.1	**Determines and** uses **appropriate** geometric theorems and properties of rigid motions, lines, angles, triangles, and parallelograms to solve problems and prove statements about angle measurement, triangles, distance, line properties, and congruence.	Uses given geometric theorems and properties of rigid motions, lines, angles, triangles, and parallelograms to solve routine problems and **prove statements** about angle measurement, triangles, distance, line properties, and congruence.	Uses given geometric theorems and properties of rigid motions, lines, angles, triangles, and parallelograms to solve routine problems and **reason about angle measurement, triangles, distance, line properties, and congruence**.	Uses given geometric theorems and properties of rigid motions, lines, angles, triangles, and parallelograms to solve routine problems.
Similarity GM: G-SRT.A.1 GM: G-SRT.A.2 GM: G-SRT.B.5	Uses transformations **and congruence and similarity criteria for triangles to prove** relationships among geometric figures and to solve problems.	**Uses** transformations to **determine** relationships **among** simple geometric figures **and to solve problems.**	Identifies transformation relationships in simple geometric figures.	Identifies transformation relationships in simple geometric figures in cases where an image is provided.
Similarity in Trigonometry GM: G-SRT.C.6 GM: G-SRT.C.7 GM: G-SRT.C.8	Uses trigonometric ratios, the Pythagorean Theorem, and the relationship between sine and cosine to solve right triangles in applied problems.	Uses trigonometric ratios, the Pythagorean Theorem, **and the relationship between sine and cosine to solve right triangles in applied problems.**	Uses trigonometric ratios and the Pythagorean Theorem to determine the unknown side lengths **and angle measurements** of a right triangle.	Uses trigonometric ratios and the Pythagorean Theorem to determine the unknown side lengths of a right triangle.
	Uses similarity transformations with right triangles to define trigonometric ratios for acute angles.			
Modeling and Applying GM: G-SRT.C.7 GM: G-SRT.C.8 GM: G-GPE.B.6 LEAP.I.GM.2	Uses geometric relationships in the coordinate plane to solve problems involving area, perimeter, and ratios of lengths.	Uses geometric relationships in the coordinate plane to solve problems involving area, perimeter, **and ratios of lengths.**	Uses provided geometric relationships in the coordinate plane to solve problems involving area and perimeter.	Uses provided geometric relationships in the coordinate plane to solve problems involving area and perimeter.
	Applies geometric concepts **and trigonometric ratios** to	Applies geometric concepts to describe, model and solve	Applies geometric concepts to describe, model and solve	Applies geometric concepts to describe, model and solve

Major Content				
Content	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
	describe, model and solve applied problems **(including design problems)** related to the Pythagorean Theorem, **density,** geometric shapes, measures, and properties.	applied problems related to the Pythagorean Theorem, geometric shapes, measures, and properties.	applied problems related to **the Pythagorean Theorem**, geometric shapes, measures, and properties.	applied problems related to geometric shapes, measures, and properties.

ADDITIONAL & SUPPORTING CONTENT

The student solves problems involving the Additional & Supporting Content for the course with connections to the Standards for Mathematical Practice.

Additional & Supporting Content				
Content	Level 5: Advanced	Level 4: Mastery	Level 3: Basic	Level 2: Approaching Basic
Transformations GM: G-CO.A.1 GM: G-CO.A.3 GM: G-CO.A.5	Given a figure and **a sequence of** transformations, identifies the transformed figure.	Given a figure and a transformation, identifies the transformed figure.	Given a figure and a transformation, identifies the transformed figure.	Given a figure and a transformation, identifies a transformed figure.
	Uses precise geometric terminology to specify a sequence of transformations that will carry a figure onto **itself or** another.	**Specifies a sequence of transformations that will carry a figure onto another.**		
Geometric Constructions LEAP.I.GM.3	Understands geometric constructions: copying a segment, copying an angle, bisecting an angle, bisecting a segment, including the perpendicular bisector of a line segment.	Understands geometric constructions: copying a segment, copying an angle, bisecting an angle, bisecting a segment, including the perpendicular bisector of a line segment.	Understands basic geometric constructions: copying a segment, copying an angle, **bisecting an angle, bisecting a segment, including the perpendicular bisector of a line segment.**	Understands basic geometric constructions: copying a segment, and copying an angle
	Given a line and a point not on the line, **uses a variety of tools and methods** to construct perpendicular and parallel lines.	**Given a line and a point not on the line, constructs perpendicular and parallel lines.**		
	Uses a variety of tools and methods to construct equilateral triangles, squares, and hexagons inscribed in circles.			
Applying Geometric Properties and Theorems GM: G-C.A.2	Applies properties and theorems of angles, segments and arcs in circles to solve problems **and model relationships.**	Applies properties and theorems of angles, segments and arcs in circles to solve problems.	Applies properties and theorems of angles, segments and **arcs in circles** to solve problems.	Applies properties and theorems of angles and segments to solve problems

	Additional & Supporting Content			
Content	**Level 5: Advanced**	**Level 4: Mastery**	**Level 3: Basic**	**Level 2: Approaching Basic**
GM: G-GPE.A.1 LEAP.I.GM.4	Completes the square to find the center and radius of a circle given by an equation.	**Completes the square to find the center and radius of a circle given by an equation.**		
Geometric Formulas GM: G-GMD.A.1 GM: G-GMD.A.3 GM: G-GMD.B.4	**Uses volume formulas to solve mathematical and contextual problems that involve cylinders, pyramids, cones, and spheres.**	Using formulas, determines the volume of cylinders, pyramids, cones, and spheres.	Using formulas, determines the volume of cylinders, pyramids, cones, and spheres.	Using formulas, determines the volume of cylinders, pyramids, cones, and spheres.
	Identifies the shapes of two-dimensional cross-sections of three-dimensional objects **and identifies three-dimensional objects generated by rotations of two-dimensional objects.**	Identifies the shapes of two-dimensional cross-sections of three-dimensional objects.	Identifies the shapes of two-dimensional cross-sections of three-dimensional objects.	Identifies the shapes of two-dimensional cross-sections of three-dimensional objects, when cross sections are parallel or perpendicular to a base/face.
	Uses dissection arguments, **Cavalieri's principle, and informal limit arguments to support** the formula for the circumference of a circle, area of a circle, **volume of a cylinder, pyramid, and cone.**	**Gives an informal argument for the formula for the circumference of a circle and area of a circle, including dissection arguments.**		
Probability LEAP.I.GM.5	Recognizes, determines and uses conditional probability and independence in **multi-step contextual** problems, using appropriate set language and appropriate representations, including two-way frequency tables.	Recognizes, determines **and uses** conditional probability and independence in contextual problems, **using appropriate set language and appropriate representations, including two-way frequency tables.**	Recognizes and determines **conditional probability** and independence in contextual problems.	Recognizes and determines independence in contextual problems.
	Applies the Addition Rule of probability.			

EXPRESSING MATHEMATICAL REASONING

In connection with content, the student expresses course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others and/or attending to precision when making mathematical statements.

Expressing Mathematical Reasoning				
	Level 5: Advanced	**Level 4: Mastery**	**Level 3: Basic**	**Level 2: Approaching Basic**
Content	The student clearly constructs and communicates a **complete response** based on a chain of reasoning to justify or refute algebraic and/or geometric propositions or conjectures; geometric reasoning in a coordinate setting; or a response to a multi-step problem, by:	The student clearly constructs and communicates a response based on a chain of reasoning to justify or refute algebraic and/or geometric propositions or conjectures; geometric reasoning in a coordinate setting; or a response to a multi-step problem, by:	The student constructs and communicates a **partial response** based on a chain of reasoning to justify or refute algebraic and/or geometric propositions or conjectures; geometric reasoning in a coordinate setting; or a response to a multi-step problem, by:	The student constructs and communicates an incomplete response based on a chain of reasoning to justify or refute algebraic and/or geometric propositions or conjectures; geometric reasoning in a coordinate setting; or a response to a multi-step problem, by:
Reasoning LEAP.II.GM.1 LEAP.II.GM.2 LEAP.II.GM.3 LEAP.II.GM.4	• using a logical approach based on a conjecture and/or stated assumptions, utilizing mathematical connections (when appropriate)	• using a logical approach based on a conjecture and/or stated assumptions, **utilizing mathematical connections (when appropriate)**	• using a **logical** approach based on a conjecture and/or stated assumptions	• using an approach based on a conjecture and/or stated assumptions
	• providing an **efficient and logical** progression of steps or chain of reasoning with appropriate justification	• providing a **logical** progression of steps or chain of reasoning **with appropriate justification**	• providing a **logical, but incomplete,** progression of steps or chain of reasoning	• providing an incomplete or illogical progression of steps or chain of reasoning
	• performing precise calculations	• performing **precise** calculations	• **performing minor calculation errors**	• making an intrusive calculation error
	• using correct grade-level vocabulary, symbols and labels	• using **correct** grade-level vocabulary, symbols and labels	• using **some** grade-level vocabulary, symbols and labels	• using limited grade-level vocabulary, symbols and labels
	• providing a justification of a conclusion	• providing a **justification** of a conclusion	• providing a partial justification of a conclusion based on own calculations	• providing a partial justification of a conclusion based on own calculations

Expressing Mathematical Reasoning				
	Level 5: Advanced	**Level 4: Mastery**	**Level 3: Basic**	**Level 2: Approaching Basic**
Content	The student clearly constructs and communicates a **complete response** based on a chain of reasoning to justify or refute algebraic and/or geometric propositions or conjectures; geometric reasoning in a coordinate setting; or a response to a multi-step problem, by:	The student clearly constructs and communicates a response based on a chain of reasoning to justify or refute algebraic and/or geometric propositions or conjectures; geometric reasoning in a coordinate setting; or a response to a multi-step problem, by:	The student constructs and communicates a **partial response** based on a chain of reasoning to justify or refute algebraic and/or geometric propositions or conjectures; geometric reasoning in a coordinate setting; or a response to a multi-step problem, by:	The student constructs and communicates an incomplete response based on a chain of reasoning to justify or refute algebraic and/or geometric propositions or conjectures; geometric reasoning in a coordinate setting; or a response to a multi-step problem, by:
	• evaluating, interpreting, and critiquing the validity of others' responses, approaches and reasoning – using mathematical connections (when appropriate) – and **providing a counter example where applicable.**	• evaluating, interpreting, and critiquing the validity of others' responses, approaches and reasoning – using mathematical connections (when appropriate).	• evaluating the validity of others' approaches and conclusions	
	• **determining whether an argument or conclusion is generalizable**			

MODELING & APPLICATION

In connection with content, the student solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge and skills articulated in the standards for the current grade/course (or for more complex problems, knowledge and skills articulated in the standards for previous grades/courses), engaging particularly in the Modeling practice, and where helpful making sense of problems and persevering to solve them, reasoning abstractly, and quantitatively, using appropriate tools strategically, looking for the making use of structure and/or looking for and expressing regularity in repeated reasoning.

	Modeling & Application			
Content	**Level 5: Advanced**	**Level 4: Mastery**	**Level 3: Basic**	**Level 2: Approaching Basic**
	The student devises and enacts a plan to apply mathematics in solving problems arising in everyday life, society, and the workplace by:	The student devises and enacts a plan to apply mathematics in solving problems arising in everyday life, society, and the workplace by:	The student devises and enacts a plan to apply mathematics in solving problems arising in everyday life, society, and the workplace by:	The student devises and enacts a plan to apply mathematics in solving problems arising in everyday life, society, and the workplace by:
Modeling LEAP.III.GM.1 LEAP.III.GM.2 LEAP.III.GM.3 LEAP.III.GM.4 LEAP.III.GM.5	• using stated assumptions and making assumptions and approximations to simplify a re-world situation (includes micro-models)	• using stated assumptions **and making assumptions** and approximations to simplify a real-world situation **(includes micro-models)**	• using stated assumptions and approximations to simplify a real-world situation	• using stated assumptions and approximations to simplify a real-world situation
	• mapping relationships between important quantities	• **mapping relationships between** important quantities	• **illustrating relationships between** important quantities	• identifying important quantities
	• analyzing relationship mathematically between quantities to draw conclusions	• analyzing relationships mathematically between quantities to draw conclusions	• analyzing relationships mathematically **between quantities** to draw conclusions	• analyzing relationships mathematically to draw conclusions
	• **interpreting mathematical results in the context of the situation**	• interpreting mathematical results **in the context of the situation**	• **interpreting mathematical results in a simplified context**	
	• reflecting on whether the results make sense	• reflecting on whether the results make sense	• **reflecting on whether the results make sense**	
	• improving the model if it has not served its purpose	• **improving** the model if it has not served its purpose	• **modifying the model if it has not served its purpose**	

Modeling & Application				
	Level 5: Advanced	**Level 4: Mastery**	**Level 3: Basic**	**Level 2: Approaching Basic**
Content	The student devises and enacts a plan to apply mathematics in solving problems arising in everyday life, society, and the workplace by:	The student devises and enacts a plan to apply mathematics in solving problems arising in everyday life, society, and the workplace by:	The student devises and enacts a plan to apply mathematics in solving problems arising in everyday life, society, and the workplace by:	The student devises and enacts a plan to apply mathematics in solving problems arising in everyday life, society, and the workplace by:
	• writing an algebraic expression or equation to describe a situation	• writing an algebraic expression or equation to describe a situation	• writing an algebraic expression or equation to describe a situation	• writing an algebraic expression or equation to describe a situation
	• applying proportional reasoning and percentages **justifying and defending models which lead to a conclusion**	• applying proportional reasoning and percentages	• applying proportional reasoning and percentages	• applying proportional reasoning and percentages
	• applying geometric principles and theorems	• applying geometric principles and theorems	• applying geometric principles and theorems	• applying geometric principles and theorems
	• writing and using functions in any form to describe how one quantity of interest depends on another	• writing and using functions **in any form** to describe how one quantity of interest depends on another	• **writing and** using functions to describe how one quantity of interest depends on another	• using functions to describe how one quantity of interest depends on another
	• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity	• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity	• using **reasonable** estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity	• using estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity
	• **analyzing and/or creating constraints, relationships, and goals**			