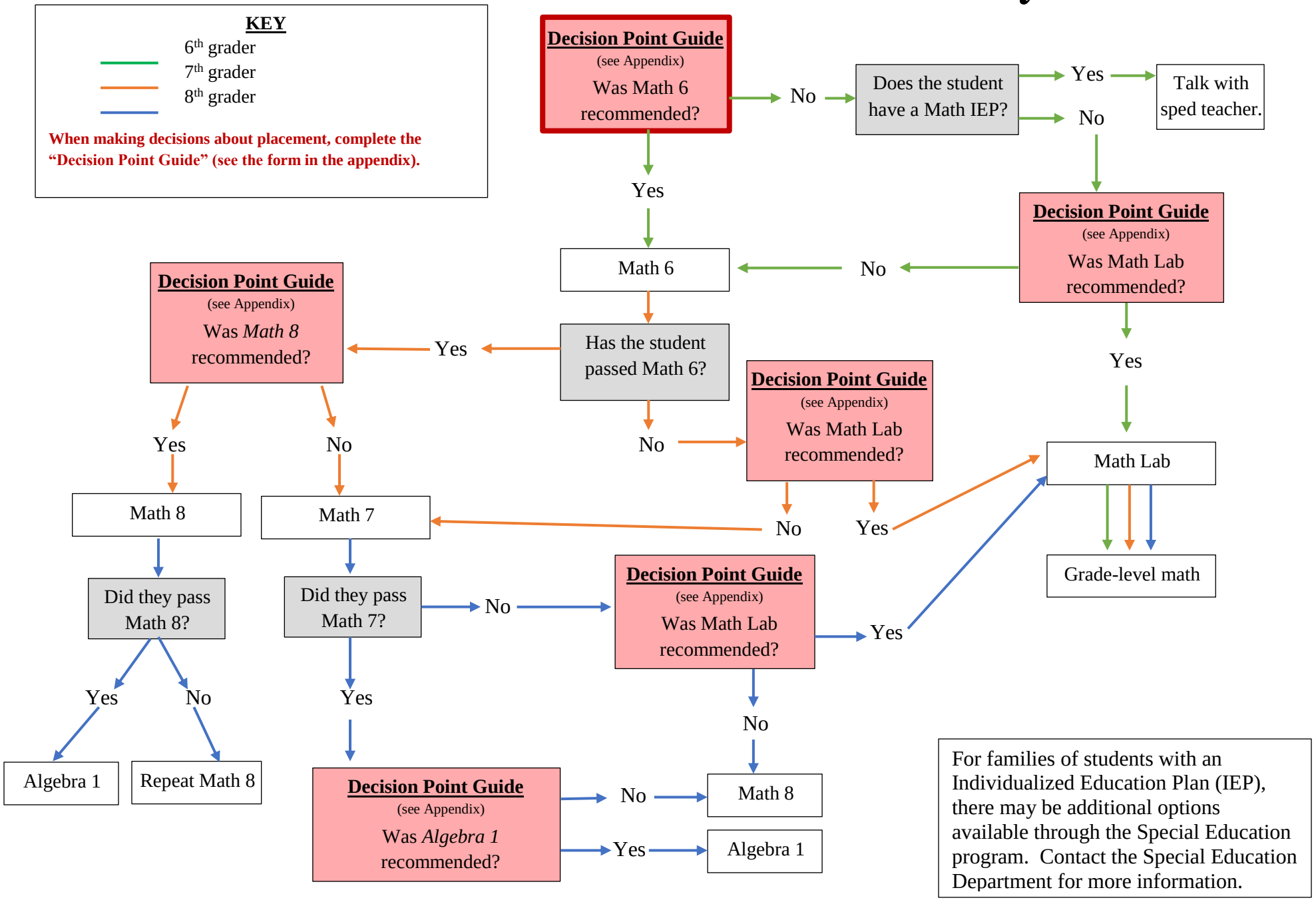
Middle School Math Courses

Grades 6 – 8

Adopted June 7, 2022

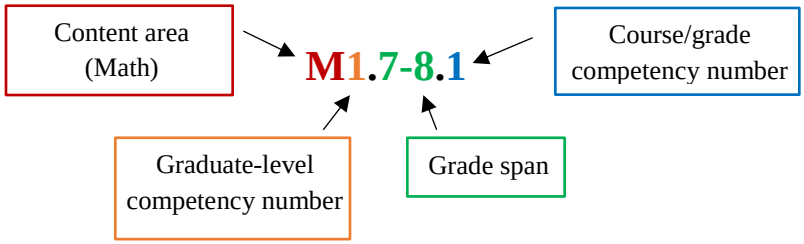
Recommended Middle School Pathways



For families of students with an Individualized Education Plan (IEP), there may be additional options available through the Special Education program. Contact the Special Education Department for more information.

Grades 6-8 Math Competencies

Competency Coding



Middle School Math Competency Checklist

Competencies	Math 6	Middle School Math Lab	Math 7	Math 8
Symbolic Expression: M1: Graduates of the FNSBSD will be able to reason abstractly and utilize symbolic expressions and mathematical models.	✓		✓	✓
M1.3-4.1: The learner will reason abstractly and quantitatively, recognizing and making appropriate use of mathematical symbols and expressions for a variety of purposes, including variables.				
M1.5-6.1: The learner will reason abstractly and manipulate symbolic expressions to represent relationships and interpret expressions and equations in terms of a given context for determining an unknown value.	✓			
M1.7-8.1: The learner will reason abstractly and manipulate symbolic expressions to represent relationships and interpret expressions and equations in terms of a given context for determining an unknown value.			✓	✓

Competencies	Math 6	Middle School Math Lab	Math 7	Math 8
Numbers and Number Systems: M2: Graduates of the FNSBSD will develop an applied knowledge of numbers and number systems to solve problems.	✓	✓	✓	✓
M2.3-4.1: The learner will demonstrate an understanding of number systems, thinking flexibly and attending to precision and reasonableness when solving problems using whole numbers, fractions, and decimals.		✓		
M2.5-6.1: The learner will expand their understanding of number systems, thinking flexibly and attending to precision and reasonableness when solving problems using rational numbers.	✓			
M2.7-8.1: The learner will expand their understanding of number systems thinking flexibly and attending to precision and reasonableness when solving problems using rational and irrational numbers.		✓	✓	✓
Reasoning and Strategic Thinking: M3: Graduates of the FNSBSD will use evidence to support authentic application of concepts and support mathematical arguments.	✓	✓	✓	✓
M3.3-4.1: The learner will apply additive, multiplicative, and fractional reasoning using multiple strategies (algorithms, models, & manipulatives) to solve authentic applied problems.				
MS.3-4.2: The learner will use reasoning and self-monitoring to analyze and justify one or more solution pathways.		✓		
M3.5-6.1: The learner will expand the use of computational strategies, algorithms, and proportional reasoning to rational numbers.	✓			
M3.5-6.2: The learner will use reasoning and metacognitive skills through making conjectures, justifying, and communicating mathematical solutions and arguments.	✓			
M3.7-8.1: The learner will expand the use of computational strategies, algorithms, and proportional reasoning to rational and irrational numbers.		✓	✓	✓
M3.7-8.2: The learner will use reasoning and metacognitive skills through making conjectures, justifying, and effectively communicating mathematical solutions and arguments.		✓	✓	✓

Competencies	Math 6	Middle School Math Lab	Math 7	Math 8
Measurement: M4: Graduates of the FNSBSD will explain reasoning when applying and modeling geometric principles.	✓	✓	✓	✓
M4.3-4.1: The learner will use measurement tools, units, and attributes to describe and compare objects, situations, or events, and to solve authentic applied measurement problems.				
M4.5-6.1: The learner will use tools and apply precision and reasoning to solve measurement problems in authentic applied contexts.	✓	✓		
M4.7-8.1: The learner will strategically use tools and apply proportional reasoning and precision to solve measurement problems in pure/ theoretical and authentic applied contexts.		✓	✓	✓
Algebraic Functions, Patterns, and Relations: M5: Graduates of the FNSBSD will utilize patterns, relations, and functions to compare, interpret, and analyze situations.	✓	✓	✓	✓
M5.3-4.1: The learner will make use of structure to represent, analyze, and generalize change or patterns in various contexts using models and justification.				
M5.5-6.1: The learner will make use of structure to describe and compare situations that involve change or patterns, and use the information to make conjectures and justify conclusions/solutions.	✓			
M5.7-8.1: The learner will make use of structure to describe and compare situations that involve proportionality, change, or patterns, and use the information to make conjectures and justify conclusions/ solutions.		✓	✓	✓

Competencies	Math 6	Middle School Math Lab	Math 7	Math 8
Geometry: M6: Graduates of the FNSBSD will solve problems involving spatial reasoning and model geometric concepts in applied contexts.	✓	✓	✓	✓
M6.3-4.1: The learner will use attributes of two-dimensional shapes and complex figures to solve authentic applied problems.				
M6.5-6.1: The learner will solve problems involving reasoning using properties of two- and three- dimensional shapes to analyze, represent, and model geometric relationships in authentic applied contexts.	✓			
M6.7-8.1: The learner will solve problems involving reasoning using properties of two- and three- dimensional shapes to analyze, represent, and model geometric relationships in pure/ theoretical and authentic applied contexts.		✓	✓	✓
Data, Analysis, Probability, and Statistics: M7: Graduates of the FNSBSD will apply statistical methods to summarize, represent, analyze, and interpret data.	✓	✓	✓	✓
M7.3-4.1: The learner will gather, represent, and interpret data related to a particular/ single context, including authentic applications.		✓		
M7.5-6.1: The learner will design investigations and gather data involving populations (data sets).	✓			
M7.7-8.1: The learner will design investigations and conduct probability experiments involving populations.		✓	✓	✓

Math 6

Grade(s): 6 **Length**: two semesters **Prerequisite**: Math 5	**Overview**: In *Math* 6, instructional time should focus on four critical areas: 1. Connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems; 2. Completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers; 3. Writing, interpreting, and using expressions and equations; and 4. Developing understanding of statistical thinking.

Mathematical Topics (Recommended Order)	
Semester 1	**Semester 2**
• Number Systems • Expressions and Equations	• Writing Ratios, Finding Unit Rates, and Solving Proportions • Perimeter, Area, Surface Area, Volume of Polygons and Rectangular Prisms • Statistics and Probability

Course/ Grade Competencies	
Semester 1	**Semester 2**
• **M1.5-6.1**: The learner will reason abstractly and manipulate symbolic expressions to represent relationships and interpret expressions and equations in terms of a given context for determining an unknown value. • **M2.5-6.1**: The learner will expand their understanding of number systems, thinking flexibly and attending to precision and reasonableness when solving problems using rational numbers. • **M3.5-6.2**: The learner will use reasoning and metacognitive skills through making conjectures, justifying, and communicating mathematical solutions and arguments. • **M5.5-6.1**: The learner will make use of structure to describe and compare situations that involve change or patterns and use the information to make conjectures and justify conclusions/solutions.	• **M3.5-6.1**: The learner will expand the use of computational strategies, algorithms, and proportional reasoning to rational numbers. • **M4.5-6.1**: The learner will use tools and apply precision and reasoning to solve measurement problems in authentic applied contexts. • **M6.5-6.1**: The learner will solve problems involving reasoning using properties of two- and three-dimensional shapes to analyze, represent, and model geometric relationships in authentic applied contexts. • **M7.5-6.1**: The learner will design investigations and gather data involving populations (data sets).

NUMBER SYSTEMS		
Graduate-Level Competency: **M2 – Numbers and Number Systems**: The learner will develop an applied knowledge of numbers and number systems to solve problems.		
Course/ Grade Competency	**Content Objectives**	**Standards**
M2.5-6.1	**Must be Covered:** The learner will: • Add and subtract rational numbers (fractions and decimals). • Find and use the greatest common factor for adding fractions. • Find and use least common multiple for reducing fractions.	**AKSS** 6.NS.1-4 **Mathematical Practices** Rational Numbers Arithmetic
	Must be Covered: The learner will: • Multiply and divide rational numbers (fractions and decimals). • Find and use least common multiple for reducing fractions.	**AKSS** 6.NS.1-4 **Mathematical Practices** Rational Numbers Arithmetic
	Must be Covered: The learner will: • Understand and order of rational numbers on a number line. • Understand absolute value. • Graph points on a coordinate plane. **Can be Covered:** The learner will: • Add and subtract integers.	**AKSS** 6.NS.5-8 **Mathematical Practices** Rational Numbers Arithmetic
Suggested Activities, Materials, and Resources:	• Number tiles for positive and negative integers. • "Good Guys (+) and Bad Guys (-)" and they battle it out for addition and subtraction. • Khan Academy • *iReady* unit 2, lesson 6 • *iReady* unit 6	

EXPRESSIONS & EQUATIONS		
Graduate-Level Competency: **M1 – Symbolic Expression**: The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models. **M3 – Reasoning and Strategic Thinking**: The learner will use evidence to support authentic application of concepts and support mathematical arguments.		
Course/ Grade Competency	**Content Objectives**	**Standards**
M1.5-6.1 **M3.5-6.2**	**Must be Covered:** The learner will: • Write and solve exponential problems, including expanded form.	**AKSS** 6.EE.1 **Mathematical Practices**
	Must be Covered: The learner will: • Write, read and solve expressions with variables. • Use distributive property and factoring to simplify expressions. • Write mathematical expressions and equations from real-world problems. **Can be Covered:** The learner will: • Write two-step equations for real-world problems.	**AKSS** 6.EE.2-3, 6 **Mathematical Practices**
	Must be Covered: The learner will: • Solve one-step equations with integers and rational numbers. • Show the relationship between the dependent and independent variables in an equation. **Can be Covered:** The learner will: • Solve two-step equations with integers.	**AKSS** 7.EE.5, 7-9 **Mathematical Practices**
Suggested Activities, Materials, and Resources:	• Khan Academy • *iReady* lesson 5 and unit 5	

WRITING RATIOS, FINDING UNIT RATES, & SOLVING PROPORTIONS

Graduate-Level Competency:
M1 – Symbolic Expression: The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.
M5 – Algebraic Functions, Patterns and Relations: The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.
M3 – Reasoning and Strategic Thinking: The learner will use evidence to support authentic application of concepts and support mathematical arguments.

Course/ Grade Competency	Content Objectives	Standards
M1.5-6.1 **M3.5-6.1** **M5.5-6.1**	**Must be Covered:** The learner will: • Simplify proportions and know how to write them three different ways.	**AKSS** 6.RP.1 **Mathematical Practices**
	Must be Covered: The learner will: • Calculate unit rates using the same units with rational numbers (decimals and fractions). **Can be Covered:** The learner will: • Calculate unit rates using the different units with rational numbers (decimals and fractions).	**AKSS** 6.RP.2 **Mathematical Practices**
	Must be Covered: The learner will: • Write and solve proportions including real-world problems.	**AKSS** 6.RP.3 **Mathematical Practices**
Suggested Activities, Materials, and Resources:	• Compare unit rates for groceries (unit prices), cars (MPG), and wood prices (dollars per cord). • Khan Academy • *iReady* units 3-4	

PERIMETER, AREA, SURFACE AREA, VOLUME OF POLYGONS, & RECTANGULAR PRISMS		
Graduate-Level Competency: **M6 - Geometry**: The learner will solve problems involving spatial reasoning and model geometric concepts in applied contexts.		
Course/ Grade Competency	**Content Objectives**	**Standards**
M6.5-6.1	**Must be Covered:** The learner will: • Calculate the area of regular polygons (including on coordinate planes). • Identify the different parts of a circle. **Can be Covered:** The learner will: • Calculate the circumference and area of circles.	**AKSS** 6.G.1, 3, 5 **Mathematical Practices**
	Must be Covered: The learner will: • Represent three-dimensional figures as nets. • Calculate the volume and surface area of rectangular prisms. **Can be Covered:** The learner will: • Calculate the volume and surface area of triangular prisms.	**AKSS** 6.G.2, 4 **Mathematical Practices**
Suggested Activities, Materials, and Resources:	• Calculate the volume of fuel and water tanks used at students' homes. • Calculate the surface area and volume of their bedroom at home. • Khan Academy • *iReady* unit 1	

STATISTICS & PROBABILITY

Graduate-Level Competency:
M7 – Data, Analysis, Probability, and Statistics: The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
M7.5-6.1	**Must be Covered:** The learner will: • Write valid and invalid statistical questions, and be able to explain identify why they are valid or invalid. • Identify the distribution of a data set.	**AKSS** 6.SP.1-2 **Mathematical Practices**
	Must be Covered: The learner will: • Calculate measures of center, including range and finding outliers. • Identify when to use the different measures of center. • Explain the effect of adding or removing an outlier to the measures of center.	**AKSS** 6.SP.3, 5 **Mathematical Practices**
	Must be Covered: The learner will: • Calculate interquartile range and create box plots. • Read and create dot plots, histograms, and pie charts. **Can be Covered:** The learner will: • Calculate the standard deviations.	**AKSS** 6.SP.4-5 **Mathematical Practices**
	Must be Covered: The learner will: • Calculate simple and compound theoretical probability. • Determine whether a game is fair or unfair based on probability. **Can be Covered:** The learner will: • Calculate the experimental probability.	**AKSS** 6.SP.6-7 **Mathematical Practices**
Suggested Activities, Materials, and Resources:	• Create a game that involves probability. • Khan Academy • *iReady* unit 7	

Math 7

Grade(s): 7-8 **Length**: two semesters **Prerequisite**: *Math 6*	**Overview**: *Math 7* is for students to extend and apply many of the concepts they have learned in the previous year, to discover new types of relationships, new and efficient ways to solve problems, and new ways to analyze and look at data and associations. Students will investigate proportional relationships and use this understanding to solve real-world problems involving discounts, interest, taxes, and scale drawings. Building off their understanding of integers, students will apply the properties of operations to all rational numbers in order to efficiently and thoughtfully work with the number system, including how it applies to expressions and equations.

Mathematical Topics (Recommended Order)	
Semester 1	**Semester 2**
• Rational numbers arithmetic, including percent problems • Order of operations with rational numbers, including exponents • Unit rates, proportions, and constant of proportionality (k), including graphing k • Solving two-step equations, including distributive property equations	• Scale factors (proportions) • Supplemental and complementary angles and triangle measures • Perimeter, area, surface area, and volume of two- and three-dimensional figures (formulas forward and backward) • Statistical displays and measure of central tendencies

Course/ Grade Competencies	
Semester 1	**Semester 2**
• **M1.7-8.1**: The learner will reason abstractly and manipulate symbolic expressions to represent relationships and interpret expressions and equations in terms of a given context for determining an unknown value. • **M2.7-8.1**: The learner will expand their understanding of number systems thinking flexibly and attending to precision and reasonableness when solving problems using rational and irrational numbers. • **M3.7-8.2**: The learner will use reasoning and metacognitive skills through making conjectures, justifying, and effectively communicating mathematical solutions and arguments. • **M5.7-8.1**: The learner will make use of structure to describe and compare situations that involve proportionality, change, or patterns, and use the information to make conjectures and justify conclusions/ solutions.	• **M3.7-8.1**: The learner will expand the use of computational strategies, algorithms, and proportional reasoning to rational and irrational numbers. • **M4.7-8.1**: The learner will strategically use tools and apply proportional reasoning and precision to solve measurement problems in pure/ theoretical and authentic applied contexts. • **M6.7-8.1**: The learner will solve problems involving reasoning using properties of two- and three- dimensional shapes to analyze, represent, and model geometric relationships in pure/ theoretical and authentic applied contexts. • **M7.7-8.1**: The learner will design investigations and conduct probability experiments involving populations.

NUMBER SYSTEMS		
Graduate-Level Competency: **M2 – Numbers and Number Systems**: The learner will develop an applied knowledge of numbers and number systems to solve problems.		
Course/ Grade Competency	**Content Objectives**	**Standards**
M2.7-8.1	**Must be Covered:** The learner will: • Add and subtract integers. • Add and subtract rational numbers (fractions and decimals).	**AKSS** 7.NS.1 **Mathematical Practices** Rational Numbers Arithmetic
	Must be Covered: The learner will: • Multiply and divide integers. • Multiple and divide rational numbers (fractions and decimals).	**AKSS** 7.NS.2 **Mathematical Practices** Rational Numbers Arithmetic
	Must be Covered: The learner will: • Understand the order of operations with integers. • Understand the order of operations with rational numbers (fractions and decimals).	**AKSS** 7.NS.3 **Mathematical Practices** Rational Numbers Arithmetic
Suggested Activities, Materials, and Resources:	• Number tiles for positive and negative integers • "Good Guys (+) and Bad Guys (-)" and they battle it out for addition and subtraction • Khan Academy • iReady units 2 – 3	

RATIOS, RATES, & PROPORTIONS – CONSTANT OF PROPORTIONALITY (K), INCLUDING GRAPHING K		
Graduate-Level Competency: **M1 – Symbolic Expression**: The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models. **M5 – Algebraic Functions, Patterns and Relations**: The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.		
Course/ Grade Competency	**Content Objectives**	**Standards**
M1.7-8.1 **M5.7-8.1**	**Must be Covered:** The learner will: • Calculate unit rates using the same units with rational numbers (decimals and fractions). **Can be Covered:** The learner will: • Calculate unit rates using the different units with rational numbers (decimals and fractions).	**AKSS** 7.PR.1 **Mathematical Practices**
	Must be Covered: The learner will: • Determine if fractions, tables, and graphs are proportional and justify their answer. • Calculate and write an equation for the constant of proportionality from tables, graphs, equations and real-world problems.	**AKSS** 7.PR.2 **Mathematical Practices**
	Must be Covered: The learner will: • Graph the constant of proportionality from tables, equations, and real-world problems.	**AKSS** 7.PR.2 **Mathematical Practices**
Suggested Activities, Materials, and Resources:	• Compare unit rates for groceries (unit prices), cars (MPG), and wood prices (dollars per cord). • Khan Academy • iReady unit 1	

PERCENT PROBLEMS		
Graduate-Level Competency: **M5 – Algebraic Functions, Patterns and Relations**: The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.		
Course/ Grade Competency	**Content Objectives**	**Standards**
M5.7-8.1	**Must be Covered:** The learner will: • Calculate percent of a number. • Determine a number when given the percent. • Calculate percent increase or decrease.	**AKSS** 7.PR.3 **Mathematical Practices**
	Must be Covered: The learner will: • Solve real-world problems involving percent off, and items with and without a sales tax. **Can be Covered:** The learner will: • Calculate simple interest.	**AKSS** 7.PR.3 **Mathematical Practices**
Suggested Activities, Materials, and Resources:	• Calculate sale prices with percent off and include sales tax. • Compare simple interest versus compound interest on final cost of cars, mortgages, etc. • Khan Academy • iReady lessons 20 – 21	

EXPRESSIONS & EQUATIONS		
Graduate-Level Competency: **M1 – Symbolic Expression**: The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.		
Course/ Grade Competency	**Content Objectives**	**Standards**
M1.7-8.1	**Must be Covered:** The learner will: • Add, subtract, factor, expand, and simplify expressions and linear equations. **Can be Covered:** The learner will: • Simplify expressions and equations with fractions and decimals by multiplying each term by the greatest common factor.	**AKSS** 7.EE.1, 7.EE.2 **Mathematical Practices**
	Must be Covered: The learner will: • Solve multi-step problems with rational numbers. **Can be Covered:** The learner will: • Solve two-step equations with the integer on both sides.	**AKSS** 6.EE.3 **Mathematical Practices**
	Must be Covered: The learner will: • Solve two-step equations with integers. **Can be Covered:** The learner will: • Solve two-step equations with fractions and decimals.	**AKSS** 7.EE.4a **Mathematical Practices**
Suggested Activities, Materials, and Resources:	• Plan a holiday party for the class that includes the total cost of pizza, snacks, and drinks. • Plan potluck with the necessary utensils included in the final cost. • Khan Academy • iReady unit 4	

EXPRESSIONS & EQUATIONS (continued)		
Graduate-Level Competency: **M1 – Symbolic Expression**: The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models. **M3 – Reasoning and Strategic Thinking**: The learner will use evidence to support authentic application of concepts and support mathematical arguments.		
Course/ Grade Competency	**Content Objectives**	**Standards**
M1.7-8.1	**Must be Covered:** The learner will: • Solve two-step equations with distributive property. **Can be Covered:** The learner will: • Solve two-step equations with the integer on both sides.	**AKSS** 7.EE.4a **Mathematical Practices**
M1.7-8.1 **M3.7-8.2**	**Must be Covered:** The learner will: • Solve and graph two-step inequalities and check for reasonableness.	**AKSS** 7.EE.4b **Mathematical Practices**
Suggested Activities, Materials, and Resources:	• Students expand or reduce the holiday party by adding another classroom to the plan, or break the party into two or three smaller groups. • Khan Academy • iReady unit 4	

SCALE DRAWINGS

Graduate-Level Competency:
M4 - Measurement: The learner will explain reasoning when applying and modeling geometric principles.

Course/ Grade Competency	Content Objectives	Standards
M4.7-8.1	**Must be Covered:** The learner will: • Solve problems involving scale drawings. • Adjust to the appropriate unit as needed.	**AKSS** 7.G.1 **Mathematical Practices**
	Must be Covered: The learner will: • Bisect a line segment using a compass. • Draw various polygons (triangle, square, hexagon, and octagon) with given conditions using a compass and ruler.	**AKSS** 7.G.2 **Mathematical Practices**
Suggested Activities, Materials, and Resources:	• Recreate a picture that is a different scale. • Draw and calculate ratios to determine various side lengths of polygons based on the initial circle. • Khan Academy • iReady lesson 1	

ANGLES & CIRCLES

Graduate-Level Competency:
M3 – Reasoning and Strategic Thinking: The learner will use evidence to support authentic application of concepts and support mathematical arguments.

Course/ Grade Competency	Content Objectives	Standards
M3.7-8.1	**Must be Covered:** The learner will: • Calculate area and circumference of circles with given conditions. • Calculate volume and surface area of cylinders. **Can be Covered:** The learner will: • Calculate volume and surface area of cones.	**AKSS** 7.G.4 **Mathematical Practices**
	Must be Covered: The learner will: • Calculate supplemental and complementary angles with given conditions. • Calculate angles of triangles with given conditions. **Can be Covered:** The learner will: • Alternate and same-side angles with transversals. • Calculate remote interior angles.	**AKSS** 7.G.5 **Mathematical Practices**
Suggested Activities, Materials, and Resources:	• Lab using milliliters of water to fill a cylinder and then calculate the volume of the same cylinder in cubic centimeters for comparison. • Determine the area of a cross-section of boys' and girls' basketball. • Create a scale drawing of a parking lot with angled and perpendicular parking spaces, and justify which is the better use of space within a given area. • Khan Academy • iReady lessons 6, 28, and 29	

PERIMETER, AREA, SURFACE AREA, & VOLUME OF PRISMS & PYRAMIDS

Graduate-Level Competency:
M6 - Geometry: The learner will solve problems involving spatial reasoning and model geometric concepts in applied contexts.

Course/ Grade Competency	Content Objectives	Standards
M6.7-8.1	**Must be Covered:** The learner will: • Calculate the volume and surface area of rectangular and triangular prisms. **Can be Covered:** The learner will: • Calculate the volume and surface area of other regular prisms.	**AKSS** 7.G.6 **Mathematical Practices**
	Must be Covered: The learner will: • Determine the different types of cross-sections of three-dimensional figures.	**AKSS** 7.G.3 **Mathematical Practices**
Suggested Activities, Materials, and Resources:	• Calculate the volume of fuel and water tanks used at students' homes. • Determine the best practice per capacity for new water and fuel tanks. • Create a regular polyhedron. • Khan Academy • Shodor's interactive cross section flyer: http://www.shodor.org/interactivate/activities/CrossSectionFlyer • Polyhedron: http://www.polytope.net/hedrondude/regular3.htm • iReady lessons 25 – 27	

STATISTICS & PROBABILITY

Graduate-Level Competency:
M7 – Data, Analysis, Probability, and Statistics: The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
M7.7-8.1	**Must be Covered:** The learner will: • Understand valid and invalid samples, and why they are valid or invalid. **Can be Covered:** The learner will: • Create valid and invalid samples of a population. • Write valid and invalid sample questions.	**AKSS** 7.SP.1, 7.SP.2 **Mathematical Practices**
	Must be Covered: The learner will: • Calculate interquartile range • Calculate standard deviation **Can be Covered:** The learner will: • Calculate mean absolute deviation	**AKSS** 7.SP.3, 7.SP.4 **Mathematical Practices**
	Must be Covered: The learner will: • Calculate simple and compound probability. • Create a theoretical simple and compound probability model. • Complete an experimental simple and compound probability model. **Can be Covered:** The learner will: • Calculate the probability of flipping specific suits, numbers, or specific cards in a deck followed by a different suit, number, or specific card.	**AKSS** 7.SP.5, 7.SP.6, 7.SP.7, 7.SP.8 **Mathematical Practices**
Suggested Activities, Materials, and Resources:	• Create a game that involves probability. • Khan Academy • iReady unit 7	

Math 8

Grade(s): 7-8 **Length**: two semesters **Prerequisite**: • Math 7 or • Math 6 and teacher recommendation **Placement recommendation**: When making decisions about placement, always consider student reflection, assessment data, teacher recommendation, and parent input. (See the flowchart.)	**Overview**: In *Math 8*, students make several advances in their algebraic reasoning, particularly as it relates to linear equations. Students extend their understanding of proportional relationships to include all linear equations, and they consider what a "solution" looks like when it applies to a linear equation. They learn that linear equations can be a useful representation to model bivariate data and to make predictions. Lastly, students study figures, lines, and angles in two-dimensional and three-dimensional space, investigating how these figures move, and how they are measured. This course prepares students to take *Algebra 1*.

Mathematical Topics (Recommended Order)	
Semester 1	**Semester 2**
• Solving Linear Equations and Inequalities (One Variable) • Rigid Transformations, Congruence, and Similarity • Angle Relationships • Linear Equations and Graphs	• Integer Exponents and Scientific Notation • Numeracy (Rational and Irrational Numbers): can easily be covered within other units • Pythagorean Theorem • Volumes (Cylinders, Cones and Spheres) • Two-Way Categorical Tables and Associations

Course/ Grade Competencies	
Semester 1	**Semester 2**
• **M1.7-8.1**: The learner will reason abstractly and manipulate symbolic expressions to represent relationships and interpret expressions and equations in terms of a given context for determining an unknown value. • **M2.7-8.1**: The learner will expand their understanding of number systems thinking flexibly and attending to precision and reasonableness when solving problems using rational and irrational numbers. • **M3.7-8.1**: The learner will expand the use of computational strategies, algorithms, and proportional reasoning to rational and irrational numbers. • **M3.7-8.2**: The learner will use reasoning and metacognitive skills through making conjectures, justifying, and effectively communicating mathematical solutions and arguments. • **M4.7-8.1**: The learner will strategically use tools and apply proportional reasoning and precision to solve measurement problems in pure/ theoretical and authentic applied contexts. • **M5.7-8.1**: The learner will make use of structure to describe and compare situations that involve proportionality, change, or patterns, and use the information to make conjectures and justify conclusions/ solutions. • **M6.7-8.1**: The learner will solve problems involving reasoning using properties of two- and three- dimensional shapes to analyze, represent, and model geometric relationships in pure/ theoretical and authentic applied contexts.	• **M1.7-8.1**: The learner will reason abstractly and manipulate symbolic expressions to represent relationships and interpret expressions and equations in terms of a given context for determining an unknown value. • **M2.7-8.1**: The learner will expand their understanding of number systems thinking flexibly and attending to precision and reasonableness when solving problems using rational and irrational numbers. • **M3.7-8.1**: The learner will expand the use of computational strategies, algorithms, and proportional reasoning to rational and irrational numbers. • **M3.7-8.2**: The learner will use reasoning and metacognitive skills through making conjectures, justifying, and effectively communicating mathematical solutions and arguments. • **M4.7-8.1**: The learner will strategically use tools and apply proportional reasoning and precision to solve measurement problems in pure/ theoretical and authentic applied contexts. • **M5.7-8.1**: The learner will make use of structure to describe and compare situations that involve proportionality, change, or patterns, and use the information to make conjectures and justify conclusions/ solutions. • **M6.7-8.1**: The learner will solve problems involving reasoning using properties of two- and three- dimensional shapes to analyze, represent, and model geometric relationships in pure/ theoretical and authentic applied contexts. • **M7.7-8.1**: The learner will design investigations and conduct probability experiments involving populations.

SOLVING LINEAR EQUATIONS & INEQUALITIES WITH ONE VARIABLE

Graduate-Level Competency:
M1 – Symbolic Expression: The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.
M2 – Numbers and Number Systems: The learner will develop an applied knowledge of numbers and number systems to solve problems.
M3 – Reasoning and Strategic Thinking: The learner will use evidence to support authentic application of concepts and support mathematical arguments.
M5 – Algebraic Functions, Patterns and Relations: The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
M1.7-8.1 **M2.7-8.1** **M3.7-8.1** **M3.7-8.2**	**Must be Covered:** The learner will: • Know the definitions of a constant and a coefficient. • Know the difference between an expression and an equation. • Be able to evaluate expressions using substitution. • Be able to simplify expressions by combining like terms and or applying the distributive property. • Know that for the expression x, the coefficient is 1 and the constant is 0.	**AKSS** **Mathematical Practices** All mathematical practices are present in each unit.
M1.7-8.1 **M2.7-8.1** **M3.7-8.2** **M5.7-8.1**	**Must be Covered:** The learner will: • Solve one- or two-step equations by isolating x, or changing the associated constant to 0 with addition or subtraction and the coefficient to 1 with multiplication or division. • Solve multistep equations and understand there are multiple ways to do this. • Solve equations with variables on both sides. • Solve equations involving simplifying one or both sides by distributing and or combining like terms. • Recognize when equations have infinite or no solutions. • Write and solve equations based on word problems, including those where one variable must be written in terms of another. **Can be Covered:** The learner will: • Solving equations where clearing of fractions or cross-multiplying is involved.	**AKSS** **Mathematical Practices** All mathematical practices are present in each unit.
	Must be Covered: The learner will: • Understand inequalities and their symbols. • Graph inequalities on the number line. • Write inequalities given a graph on the number line. • Solve simple multi-step inequalities, including those where the inequality must be flipped.	**AKSS** **Mathematical Practices** All mathematical practices are present in each unit.
Suggested Activities, Materials, and Resources:	• *iReady* unit 3, lessons 10 and 11	

RIGID TRANSFORMATIONS, CONGRUENCE, & SIMILARITY

Graduate-Level Competency:
M1 – Symbolic Expression: The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.
M3 – Reasoning and Strategic Thinking: The learner will use evidence to support authentic application of concepts and support mathematical arguments.
M4 - Measurement: The learner will explain reasoning when applying and modeling geometric principles.
M5 – Algebraic Functions, Patterns and Relations: The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.
M6 - Geometry: The learner will solve problems involving spatial reasoning and model geometric concepts in applied contexts.

Course/ Grade Competency	Content Objectives	Standards
M3.7-8.2 **M4.7-8.1** **M6.7-8.1**	**Must be Covered:** The learner will: • Know what congruent means and be able to recognize congruent figures. • Know that if two figures are congruent, then one can be mapped onto the other with a sequence of rigid transformations • Know the three rigid transformations are translations, reflections, and rotations. • Be able to perform each transformation given the specific rule and graph paper (reflections will be over simple vertical or horizontal lines, and rotations will be in increments of 90 degrees). • Be able to write the rule for transformations given an image on the coordinate plane (reflections will be over simple vertical or horizontal lines, and rotations will be in increments of 90 degrees). • Be able to perform or write rules for simple sequences of translations.	**AKSS** 8.G.1, 8.G.2 **Mathematical Practices** All mathematical practices are present in each unit.
M1.7-8.1 **M3.7-8.1** **M4.7-8.1** **M5.7-8.1** **M6.7-8.1**	**Must be Covered:** The learner will: • Define, describe, and perform dilations in the coordinate plane. • Determine if two figures are similar using transformations and dilations. • Understand angle measurement and parallel or perpendicular relationships are preserved under similarity. • Find and use scale factor. • Use properties of similar triangles to model and solve problems.	**AKSS** 8.G.3, 8.G.4 **Mathematical Practices** All mathematical practices are present in each unit.
Suggested Activities, Materials, and Resources:	• Tessellation art project • *iReady* units 1 and 2 (not lessons 6 and 7)	

ANGLE RELATIONSHIPS

Graduate-Level Competency:
M1 – Symbolic Expression: The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.
M2 – Numbers and Number Systems: The learner will develop an applied knowledge of numbers and number systems to solve problems.
M3 – Reasoning and Strategic Thinking: The learner will use evidence to support authentic application of concepts and support mathematical arguments.
M4 - Measurement: The learner will explain reasoning when applying and modeling geometric principles.
M6 - Geometry: The learner will solve problems involving spatial reasoning and model geometric concepts in applied contexts.

Course/ Grade Competency	Content Objectives	Standards
M1.7-8.1 **M2.7-8.1** **M3.7-8.2** **M4.7-8.1** **M6.7-8.1**	**Must be Covered:** The learner will: • Identify vertical, supplementary, and complementary angles. • Identify corresponding angles, alternate interior and alternate exterior angles in parallel lines and transversals. • Know the relationships between all of the above angles. • Define and use the interior angle sum for triangles. • Define and use the exterior angle sum for triangles. • Define and use the angle-angle criterion for similar triangles. • Solve for missing angles and or variables using equations. **Can be Covered:** The learner will: • Use the interior angle sum to derive the formula (n-2)180 for finding the sum of interior angles for any polygon with n sides.	**AKSS** 8.G.5 **Mathematical Practices** All mathematical practices are present in each unit.
Suggested Activities, Materials, and Resources:	• *iReady* unit 2, lessons 6 and 7	

LINEAR EQUATIONS & GRAPHS

Graduate-Level Competency:
M5 – Algebraic Functions, Patterns and Relations: The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
M5.7-8.1	**Must be Covered:** The learner will: • Know that linear equations can be represented in tables, graphs, and equations. • Know the four quadrants of the coordinate plane. • Know the x and y axes and the origin. • Be able to interpret scale for both axes. • Understand that x is the independent variable and y is the dependent variable. • Be able to graph linear equations from a table of values. • Understand slope as rise over run or a unit rate. • Determine slopes from graphs or word problems. • Understand the meaning of y intercept as the value of y when x is 0. • Be able to identify the y intercept from graphs or simple word problems • Recognize slope intercept form as y = mx + b, where m or slope is the coefficient of x. • Recognize the effect of slope on the steepness or direction of a graph. • Graph equations written in slope intercept form or written in word problems. • Know that proportional relationships are linear equations where the constant of proportionality is the slope and the y intercept is 0. • Know horizontal lines are linear equations where slope is 0 leading to the form y = b. • Know vertical lines have undefined slope because the change in x is 0 and division by 0 is undefined. • Know vertical lines are written as x = a constant. **Can be Covered:** The learner will: • Find the slope from a table or two coordinate pairs. • Write the slope intercept form of a linear equation when only given two points.	**AKSS** 8.EE.5, 8.F.2, 8.F.4 **Mathematical Practices** All mathematical practices are present in each unit.
Suggested Activities, Materials, and Resources:	• *iReady* unit 3 (not lessons 10 and 11)	

INTEGER EXPONENTS & SCIENTIFIC NOTATION

Graduate-Level Competency:
M1 – Symbolic Expression: The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.
M2 – Numbers and Number Systems: The learner will develop an applied knowledge of numbers and number systems to solve problems.
M3 – Reasoning and Strategic Thinking: The learner will use evidence to support authentic application of concepts and support mathematical arguments.
M5 – Algebraic Functions, Patterns and Relations: The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
M1.7-8.1 **M2.7-8.1** **M3.7-8.1** **M5.7-8.1**	**Must be Covered:** The learner will: • Identify equivalent exponential expressions. • Evaluate numerical or algebraic expressions with exponents using the order of operations. • Understand the effect of positive and negative bases with odd and even exponents. • Understand the properties of exponents including product property, quotient property, and power to a power property. • Recognize zero and negative (integer) exponents. • Simplify exponential expressions using all properties.	**AKSS** 8.EE.1, 8.EE.2 **Mathematical Practices** All mathematical practices are present in each unit.
	Must be Covered: The learner will: • Write small or large numbers as powers of 10. • Write numbers in scientific notation. • Convert numbers written in scientific notation into standard form. • Compare numbers written in either form. • Multiply, divide, add, and subtract numbers written in scientific notation, using exponential properties. • Interpret scientific notation values on calculators.	**AKSS** 8.EE.1, 8.EE.3, 8.EE.4 **Mathematical Practices** All mathematical practices are present in each unit.
Suggested Activities, Materials, and Resources:	• *iReady* unit 5	

NUMERACY		
Graduate-Level Competency: **M2 – Numbers and Number Systems**: The learner will develop an applied knowledge of numbers and number systems to solve problems. **M3 – Reasoning and Strategic Thinking**: The learner will use evidence to support authentic application of concepts and support mathematical arguments.		
Course/ Grade Competency	**Content Objectives**	**Standards**
M2.7-8.1 **M3.7-8.1**	**Must be Covered:** The learner will: • Define, evaluate, or estimate square and cube roots. • Understand that squares and square roots and cubes and cube roots are inverse operations. • Define and be able to identify rational numbers. • Define and be able to identify irrational numbers, including pi and square roots of nonperfect squares. • Approximate the value of irrational numbers and locate on a number line. • Compare values of rational and irrational numbers. **Can be Covered:** The learner will: • Know why there is no real square root to a negative number, and that square roots of negative numbers are classified as imaginary numbers.	**AKSS** 8.NS.1, 8.NS.2, 8.EE.2 **Mathematical Practices** All mathematical practices are present in each unit.
M2.7-8.1 **M3.7-8.2**	**Must be Covered:** The learner will: • Understand that division of zero is not possible; for example a vertical line has undefined slope because the "run" in "rise over run" is 0.	**AKSS** **Mathematical Practices** All mathematical practices are present in each unit.
Suggested Activities, Materials, and Resources:	• *iReady* unit 6, lessons 23-25	

PYTHAGOREAN THEOREM

Graduate-Level Competency:
M1 – Symbolic Expression: The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.
M2 – Numbers and Number Systems: The learner will develop an applied knowledge of numbers and number systems to solve problems.
M3 – Reasoning and Strategic Thinking: The learner will use evidence to support authentic application of concepts and support mathematical arguments.
M4 - Measurement: The learner will explain reasoning when applying and modeling geometric principles.
M6 - Geometry: The learner will solve problems involving spatial reasoning and model geometric concepts in applied contexts.

Course/ Grade Competency	Content Objectives	Standards
M1.7-8.1 **M2.7-8.1** **M3.7-8.1** **M3.7-8.2** **M4.7-8.1** **M6.7-8.1**	**Must be Covered:** The learner will: • Learn the Pythagorean Theorem. • Use the converse to determine if a triangle is a right triangle. • Use the Pythagorean Theorem to find missing side lengths of right triangles, slant height of cones, or distance between points in the coordinate plane. • Apply the Pythagorean Theorem in area and perimeter problems and other real-world problems.	**AKSS** 8.EE.2, 8.G.6, 8.G.7, 8.G.8 **Mathematical Practices** All mathematical practices are present in each unit.
Suggested Activities, Materials, and Resources:	• *iReady* unit 6, lessons 26-27	

VOLUME OF CYLINDERS, CONES, & SPHERES

Graduate-Level Competency:
M1 – Symbolic Expression: The learner will be able to reason abstractly and utilize symbolic expressions and mathematical models.
M2 – Numbers and Number Systems: The learner will develop an applied knowledge of numbers and number systems to solve problems.
M3 – Reasoning and Strategic Thinking: The learner will use evidence to support authentic application of concepts and support mathematical arguments.
M4 - Measurement: The learner will explain reasoning when applying and modeling geometric principles.
M6 - Geometry: The learner will solve problems involving spatial reasoning and model geometric concepts in applied contexts.

Course/ Grade Competency	Content Objectives	Standards
M1.7-8.1 **M2.7-8.1** **M3.7-8.1** **M4.7-8.1** **M6.7-8.1**	**Must be Covered:** The learner will: • Find the volume of cylinders, cones, and spheres. • Understand the proportional relationship between a cylinder and cone with equal radius and height. • Be able to find missing dimensions when given the volume of cones, cylinders, or spheres. • Find the volumes of composite shapes that include cylinders, cones, or spheres.	**AKSS** 8.EE.2, 8.G.9 **Mathematical Practices** All mathematical practices are present in each unit.
Suggested Activities, Materials, and Resources:	• Lab to derive volume of cones based on cylinders. • *iReady* unit 6, lessons 28-29	

TWO-WAY CATEGORICAL TABLES & ASSOCIATIONS

Graduate-Level Competency:
M7 – Data, Analysis, Probability, and Statistics: The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
M7.7-8.1	**Must be Covered:** The learner will: • Know the difference between numerical and categorical data. • Create and analyze two-way tables of bivariate categorical data for associations. • Calculate relative frequencies in two-way tables to investigate associations.	**AKSS** 8.SP.4 **Mathematical Practices** All mathematical practices are present in each unit.
Suggested Activities, Materials, and Resources:	• Gather data on "the dress" (is it black and blue or white and gold), and look for associations between gender and color seen or age and color seen. • *iReady* unit 7	

Middle School Math Lab

Grade(s): 6-8 **Length**: two semesters **Prerequisite**: Teacher recommendation **Placement recommendation**: Student scored below the 20th percentile on the most recent MAP test and more than one grade level below their current grade level on iReady. Complete the "Decision Point" form.	**Overview**: *Middle School Math Lab* is for any middle school student struggling to achieve math success. The goal of this course is to help students be successful with minimum intervention. *Math Lab* provides students with individualized instruction designed to support success in completing mathematics content. It will relate and reinforce mathematic skills students have learned previously, fill in gaps and misconceptions of previous content, and present the current content in concrete and hands-on methods. Completion of this course will place the student in current grade-level math or higher.

Mathematical Topics (Recommended Order)	
Semester 1	**Semester 2**
• Place Value • Basic Computation • Integers • Fractions • Decimals • Order of Operations • Conversions	• Solving • Formulas • Financial • Coordinate Plane • Statistics

Course/ Grade Competencies	
Semester 1	**Semester 2**
• **M2.3-4.1**: The learner will demonstrate an understanding of number systems, thinking flexibly and attending to precision and reasonableness when solving problems using whole numbers, fractions, and decimals. • **M2.7-8.1**: The learner will expand their understanding of number systems thinking flexibly and attending to precision and reasonableness when solving problems using rational and irrational numbers. • **M4.5-6.1**: The learner will use tools and apply precision and reasoning to solve measurement problems in authentic applied contexts.	• **MS.3-4.2**: The learner will use reasoning and self-monitoring to analyze and justify one or more solution pathways. • **M3.7-8.1**: The learner will expand the use of computational strategies, algorithms, and proportional reasoning to rational and irrational numbers. • **M3.7-8.2**: The learner will use reasoning and metacognitive skills through making conjectures, justifying, and effectively communicating mathematical solutions and arguments. • **M4.7-8.1**: The learner will strategically use tools and apply proportional reasoning and precision to solve measurement problems in pure/ theoretical and authentic applied contexts. • **M5.7-8.1**: The learner will make use of structure to describe and compare situations that involve proportionality, change, or patterns, and use the information to make conjectures and justify conclusions/ solutions. • **M6.7-8.1**: The learner will solve problems involving reasoning using properties of two- and three- dimensional shapes to analyze, represent, and model geometric relationships in pure/ theoretical and authentic applied contexts. • **M7.3-4.1**: The learner will gather, represent, and interpret data related to a particular/ single context, including authentic applications. • **M7.7-8.1**: The learner will design investigations and conduct probability experiments involving populations.

PLACE VALUE

Graduate-Level Competency:
M2 – Numbers and Number Systems: The learner will develop an applied knowledge of numbers and number systems to solve problems.

Course/ Grade Competency	Content Objectives	Standards
M2.7-8.1	**Must be Covered:** The learner will: • Estimate a number to check to see if their answer makes sense. • Determining the reasonableness of their answer. Suggested materials: • *iReady* grade 2, lesson 23	**AKSS** 4.NBT.3, 7.EE.3 **Mathematical Practices** 1, 3, 6
	Must be Covered: The learner will: • Round a number to a given place. Suggested materials: • *iReady* grade 3, lesson 1 • *iReady* grade 4, lesson 9	**AKSS** 4.NBT.3, 5.NBT.4, 6.NS.3 **Mathematical Practices** 1, 3, 6
	Must be Covered: The learner will: • Determine the difference between estimating & rounding. • Determine when to estimate and when to round.	**AKSS** 4.NBT.3 **Mathematical Practices** 1, 3, 5, 6
Suggested Activities, Materials, and Resources:	• *iReady* grade 2, lesson 23 • *iReady* grade 3, lesson 1 • *iReady* grade 4, lesson 9	

BASIC COMPUTATION		
Graduate-Level Competency: **M2 – Numbers and Number Systems**: The learner will develop an applied knowledge of numbers and number systems to solve problems.		
Course/ Grade Competency	**Content Objectives**	**Standards**
M2.3-4.1	**Must be Covered:** The learner will: • Add multi-digit numbers using multiple scenarios and determine the reasonableness of their answer. • Add multi-digit numbers with regrouping and determine the reasonableness of their answer. Suggested Materials: • *iReady* grade 3, lesson 2	**AKSS** 4.NBT.4 **Mathematical Practices** 1, 2, 3, 6
	Must be Covered: The learner will: • Subtract multi-digit numbers using multiple scenarios and determine the reasonableness of their answer. • Subtract multi-digit numbers with borrowing and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 3, lesson 3	**AKSS** 4.NBT.4 **Mathematical Practices** 1, 2, 3, 6
M2.3-4.1 **M2.7-8.1**	**Must be Covered:** The learner will: • Multiply multi-digit numbers using multiple scenarios and determine the reasonableness of their answer. **Can be Covered:** The learner will: • Simplify exponents (squares and cubes) and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 3, lesson 8 • *iReady* grade 3, lesson 9 • *iReady* grade 4, lesson 12 • *iReady* grade 5, lesson 4 • *iReady* grade 6, lesson 5	**AKSS** 5.NBT.5 **Mathematical Practices** 1, 2, 3, 6

BASIC COMPUTATION (continued)		
Course/ Grade Competency	**Content Objectives**	**Standards**
M2.3-4.1	**Must be Covered:** The learner will: • Divide multi-digit numbers using multiple scenarios and determine the reasonableness of their answer. **Can be Covered:** The learner will: • Simplify roots (squares and cubes) and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 4, lesson 15 • *iReady* grade 5, lesson 5 • *iReady* grade 8, lesson 23	**AKSS** 5.NBT.5 **Mathematical Practices** 1, 2, 3, 6
Suggested Activities, Materials, and Resources:	• *iReady* grade 3, lesson 2 • *iReady* grade 3, lesson 3 • *iReady* grade 3, lesson 8 • *iReady* grade 3, lesson 9 • *iReady* grade 4, lesson 12 • *iReady* grade 4, lesson 15 • *iReady* grade 5, lesson 4 • *iReady* grade 5, lesson 5 • *iReady* grade 6, lesson 5 • *iReady* grade 8, lesson 23	

INTEGERS

Graduate-Level Competency:
M2 – Numbers and Number Systems: The learner will develop an applied knowledge of numbers and number systems to solve problems.

Course/ Grade Competency	Content Objectives	Standards
M2.7-8.1	**Must be Covered:** The learner will: • Add integers using manipulatives and visuals. • Add integers using multiple scenarios and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 7, lesson 10 • *iReady* grade 7, lesson 14	**AKSS** 6.NS.5, 6.NS.6, 7.NS.2 **Mathematical Practices** 1, 3, 4, 6
	Must be Covered: The learner will: • Subtract integers using manipulatives and visuals. • Subtract integers using multiple scenarios and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 7, lesson 10 • *iReady* grade 7, lesson 14	**AKSS** **Mathematical Practices**
	Must be Covered: The learner will: • Multiply integers using manipulatives and visuals. • Multiply integers using multiple scenarios and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 7, lesson 12 • *iReady* grade 7, lesson 14	**AKSS** **Mathematical Practices**
	Must be Covered: The learner will: • Divide integers using manipulatives and visuals. • Divide integers using multiple scenarios and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 7, lesson 12 • *iReady* grade 7, lesson 14	**AKSS** **Mathematical Practices**
Suggested Activities, Materials, and Resources:	• Alaskan temperature – above/ below zero • Protons/ neutrons – positive and negative charge • Sea level • *iReady* grade 7, lesson 10 • *iReady* grade 7, lesson 12 • *iReady* grade 7, lesson 14	

FRACTIONS

Graduate-Level Competency:
M2 – Numbers and Number Systems: The learner will develop an applied knowledge of numbers and number systems to solve problems.

Course/ Grade Competency	Content Objectives	Standards
M2.3-4.1 **M2.7-8.1**	**Must be Covered:** The learner will: • Use least common multiple to find common denominators. • Add/subtract fractions using manipulatives and visuals. • Add/subtract fractions using multiple scenarios and determine the reasonableness of their answer. • Use greatest common factor to simplify fractions. • Understand improper fractions versus mixed numbers. Suggested materials: • *iReady* grade 4, lesson 8 • *iReady* grade 4, lesson 20 • *iReady* grade 4, lesson 21 • *iReady* grade 5, lesson 12 • *iReady* grade 5, lesson 13 • *iReady* grade 5, lesson 14	**AKSS** 4.OA.4, 5.NF.2, 7.NS.3 **Mathematical Practices** 1, 2, 3, 4, 6
	Must be Covered: The learner will: • Multiply fractions using manipulatives and visuals. • Multiply fractions using multiple scenarios and determine the reasonableness of their answer. • Use greatest common factor to simplify fractions. • Understand improper fractions versus mixed numbers. **Can be Covered:** The learner will: • Cancel before multiplying. Suggested materials: • *iReady* grade 4, lesson 24 • *iReady* grade 5, lesson 19 • *iReady* grade 5, lesson 21 • *iReady* grade 5, lesson 22	**AKSS** 5.NF.6, 7.NS.3 **Mathematical Practices** 1, 2, 3, 4, 6

<table>
<tr><th colspan="3">FRACTIONS (continued)</th></tr>
<tr><th>Course/ Grade Competency</th><th>Content Objectives</th><th>Standards</th></tr>
<tr><td rowspan="2">M2.3-4.1
M2.7-8.1</td><td><u>Must be Covered:</u>
The learner will:
Divide fractions using manipulatives and visuals.
Divide fractions using multiple scenarios and determine the reasonableness of their answer.
Use greatest common factor to simplify fractions.
Understand improper fractions versus mixed numbers.
<u>Can be Covered:</u>
The learner will:
Cancel before dividing.
Suggested materials:
iReady grade 5, lesson 23
iReady grade 5, lesson 24
iReady grade 6, lesson 9
iReady grade 6, lesson 10</td><td><u>AKSS</u>
5.NF.7, 6.NS.1, 7.NS.3

<u>Mathematical Practices</u>
1, 2, 3, 4, 6</td></tr>
<tr><td><u>Must be Covered:</u>
The learner will:
Solve equivalent fractions using greatest common factor (simplifying).
Solve equivalent fractions using least common multiple.
Suggested materials:
iReady grade 5, lesson 23
iReady grade 5, lesson 24
iReady grade 6, lesson 9
iReady grade 6, lesson 10</td><td><u>AKSS</u>
6.NS.4

<u>Mathematical Practices</u>
1, 2, 3, 6</td></tr>
<tr><td>Suggested Activities, Materials, and Resources:</td><td colspan="2">Cooking
Construction
iReady grade 3, lesson 23
iReady grade 4, lesson 8
iReady grade 4, lesson 17
iReady grade 4, lesson 20
iReady grade 4, lesson 21
iReady grade 4, lesson 24
iReady grade 5, lesson 12
iReady grade 5, lesson 13
iReady grade 5, lesson 14
iReady grade 5, lesson 19
iReady grade 5, lesson 21
iReady grade 5, lesson 22
iReady grade 5, lesson 23
iReady grade 5, lesson 24
iReady grade 6, lesson 9
iReady grade 6, lesson 10
iReady grade 6, lesson 13</td></tr>
</table>

DECIMALS

Graduate-Level Competency:
M2 – Numbers and Number Systems: The learner will develop an applied knowledge of numbers and number systems to solve problems.

Course/ Grade Competency	Content Objectives	Standards
M2.3-4.1 **M2.7-8.1**	**Must be Covered:** The learner will: • Add multi-digit decimals with regrouping and determine the reasonableness of their answer. • Add decimals using multiple scenarios and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 5, lesson 10 • *iReady* grade 5, lesson 14 • *iReady* grade 6, lesson 7	**AKSS** 6.NS.3, 7.NS.3 **Mathematical Practices** 1, 2, 3, 4, 6
	Must be Covered: The learner will: • Subtract multi-digit numbers with borrowing and determine the reasonableness of their answer. • Subtract decimals using multiple scenarios and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 5, lesson 11 • *iReady* grade 5, lesson 14 • *iReady* grade 6, lesson 7	**AKSS** 6.NS.3, 7.NS.3 **Mathematical Practices** 1, 2, 3, 4, 6
	Must be Covered: The learner will: • Multiply multi-digit decimals using multiple scenarios and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 5, lesson 16 • *iReady* grade 6, lesson 7	**AKSS** 6.NS.3, 7.NS.3 **Mathematical Practices** 1, 2, 3, 4, 6

DECIMALS (continued)		
Course/ Grade Competency	**Content Objectives**	**Standards**
M2.3-4.1 **M2.7-8.1**	**Must be Covered:** The learner will: • Divide multi-digit decimals using multiple scenarios and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 5, lesson 17 • *iReady* grade 5, lesson 18 • *iReady* grade 6, lesson 8	**AKSS** 6.NS.3, 7.NS.3 **Mathematical Practices** 1, 2, 3, 4, 6
Suggested Activities, Materials, and Resources:	• *iReady* grade 5, lesson 10 • *iReady* grade 5, lesson 11 • *iReady* grade 5, lesson 14 • *iReady* grade 5, lesson 16 • *iReady* grade 5, lesson 17 • *iReady* grade 5, lesson 18 • *iReady* grade 6, lesson 7 • *iReady* grade 6, lesson 8	

ORDER OF OPERATIONS

Graduate-Level Competency:
M2 – Numbers and Number Systems: The learner will develop an applied knowledge of numbers and number systems to solve problems.

Course/ Grade Competency	Content Objectives	Standards
M2.7-8.1	**Must be Covered:** The learner will: • Simplify two-step expressions (including integers, fractions, & decimals) and determine the reasonableness of their answer. • Simplify three-step expressions (including integers, fractions, & decimals) and determine the reasonableness of their answer.	**AKSS** 6.EE.2, 7.EE.1, 7.EE.2 **Mathematical Practices** 1, 3, 6, 8
	Must be Covered: The learner will: • Simplify expressions with Distributive Property (including integers, fractions, & decimals) and determine the reasonableness of their answer. • Simplify expressions with various grouping symbols (including integers, fractions, & decimals) and determine the reasonableness of their answer.	**AKSS** 6.EE.2, 7.EE.1, 7.EE.2 **Mathematical Practices** 1, 3, 6, 8
Suggested Activities, Materials, and Resources:		

CONVERSIONS

Graduate-Level Competency:
M2 – Numbers and Number Systems: The learner will develop an applied knowledge of numbers and number systems to solve problems.
M4 - Measurement: The learner will explain reasoning when applying and modeling geometric principles.

Course/ Grade Competency	Content Objectives	Standards
M2.7-8.1	**Must be Covered:** The learner will: • Convert fractions to decimals and determine the reasonableness of their answer. • Convert fractions to percent and determine the reasonableness of their answer. • Convert decimals to fractions and determine the reasonableness of their answer. • Convert decimals to percent and determine the reasonableness of their answer. • Convert percent to decimals and determine the reasonableness of their answer. • Convert percent to fractions and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 4, lesson 26	**AKSS** 7.NS.2 **Mathematical Practices** 1, 2, 3, 4, 6, 7
M2.7-8.1 **M4.5-6.1**	**Must be Covered:** The learner will: • Convert units of length and determine the reasonableness of their answer. • Convert units of liquid and determine the reasonableness of their answer. • Convert units of weight and determine the reasonableness of their answer. • Convert units of time and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 3, lesson 27 • *iReady* grade 3, lesson 28 • *iReady* grade 3, lesson 29 • *iReady* grade 4, lesson 28 • *iReady* grade 4, lesson 29 • *iReady* grade 5, lesson 25 • *iReady* grade 5, lesson 26	**AKSS** 5.MD.1, 5.MD.2 **Mathematical Practices** 1, 2, 3, 4, 6, 7
Suggested Activities, Materials, and Resources:	• *iReady* grade 3, lesson 27 • *iReady* grade 3, lesson 28 • *iReady* grade 3, lesson 29 • *iReady* grade 4, lesson 26 • *iReady* grade 4, lesson 28 • *iReady* grade 4, lesson 29 • *iReady* grade 5, lesson 25 • *iReady* grade 5, lesson 26	

SOLVING

Graduate-Level Competency:
M3 – Reasoning and Strategic Thinking: The learner will use evidence to support authentic application of concepts and support mathematical arguments.

Course/ Grade Competency	Content Objectives	Standards
M3.3-4.2 **M3.7-8.1** **M3.7-8.2**	**Must be Covered:** The learner will: • Solve one-step equations and determine the reasonableness of their answer. • Solve two-step equations and determine the reasonableness of their answer. **Can be Covered:** The learner will: • Solve multi-step equations and determine the reasonableness of their answer. • Solve one-step inequalities and determine the reasonableness of their answer. • Solve two-step inequalities and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 2, lesson 3 • *iReady* grade 3, lesson 17 • *iReady* grade 3, lesson 18 • *iReady* grade 6, lesson 21 • *iReady* grade 7, lesson 17 • *iReady* grade 7, lesson 18 • *iReady* grade 7, lesson 19	**AKSS** 6.EE.7, 6.EE.5, 7.EE.3, 7.EE.4 **Mathematical Practices** 1, 3, 6, 7, 8
	Must be Covered: The learner will: • Solve equations with Distributive Property and determine the reasonableness of their answer. **Can be Covered:** The learner will: • Solve with variables on both sides and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 8, lesson 10	**AKSS** **AKSS** 6.EE.7, 7.EE.3, 7.EE.4 **Mathematical Practices** 1, 3, 6, 7, 8
Suggested Activities, Materials, and Resources:	• *iReady* grade 2, lesson 3 • *iReady* grade 3, lesson 17 • *iReady* grade 3, lesson 18 • *iReady* grade 6, lesson 21 • *iReady* grade 7, lesson 17 • *iReady* grade 7, lesson 18 • *iReady* grade 7, lesson 19 • *iReady* grade 8, lesson 10	

FORMULAS

Graduate-Level Competency:
M3 – Reasoning and Strategic Thinking: The learner will use evidence to support authentic application of concepts and support mathematical arguments.
M4 - Measurement: The learner will explain reasoning when applying and modeling geometric principles.
M6 - Geometry: The learner will solve problems involving spatial reasoning and model geometric concepts in applied contexts.

Course/ Grade Competency	Content Objectives	Standards
M3.3-4.2 **M3.7-8.1** **M3.7-8.2** **M4.7-8.1**	**Must be Covered:** The learner will: • Find the perimeter or circumference of the given shape, and determine the reasonableness of their answer. **Can be Covered:** The learner will: • Find the perimeter and/or circumference of complex shapes, and determine the reasonableness of their answer. • Find the missing measurement using perimeter or circumference, and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 3, lesson 32 • *iReady* grade 4, lesson 16 • *iReady* grade 7, lesson 6	**AKSS** 3.MD.10, 6.G.5, 7.G.4 **Mathematical Practices** 1, 2, 3, 4, 5, 6, 7, 8
M3.3-4.2 **M3.7-8.1** **M3.7-8.2** **M4.7-8.1** **M6.7-8.1**	**Must be Covered:** The learner will: • Find the area of the given shape and determine the reasonableness of their answer. **Can be Covered:** The learner will: • Find the area of complex shapes and determine the reasonableness of their answer. • Find the area of the shaded region and determine the reasonableness of their answer. • Use the Pythagorean Theorem to find the missing information and determine the reasonableness of their answer. • Find the surface area of the given shape and determine the reasonableness of their answer. • Find the missing measurement using area formulas and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 3, lesson 15 • *iReady* grade 3, lesson 16 • *iReady* grade 3, lesson 32 • *iReady* grade 4, lesson 16 • *iReady* grade 5, lesson 20 • *iReady* grade 6, lesson 1 • *iReady* grade 6, lesson 2 • *iReady* grade 7, lesson 6 • *iReady* grade 7, lesson 25	**AKSS** 6.G.1, 7.G.4, 7.G.6, 8.G.6, 8.G.7, 8.G.8 **Mathematical Practices** 1, 2, 3, 4, 5, 6, 7, 8

<table>
<tr><th colspan="3">FORMULAS (continued)</th></tr>
<tr><th>Course/ Grade Competency</th><th>Content Objectives</th><th>Standards</th></tr>
<tr><td></td><td><u>Must be Covered:</u>
The learner will:
• Find the volume of the given shape and determine the reasonableness of their answer.
<u>Can be Covered:</u>
The learner will:
• Find the volume of complex shapes and determine the reasonableness of their answer.
• Find the missing measurement using volume formulas and determine the reasonableness of their answer.

Suggested materials:
• iReady grade 5, lesson 1
• iReady grade 5, lesson 2
• iReady grade 5, lesson 3
• iReady grade 7, lesson 26
• iReady grade 8, lesson 28</td><td><u>AKSS</u>
5.MD.7, 6.G.2, 7.G.6

<u>Mathematical Practices</u>
1, 2, 3, 4, 5, 6, 7, 8</td></tr>
<tr><td>M3.3-4.2
M3.7-8.2</td><td><u>Must be Covered:</u>
The learner will:
• Use D=rt to find the missing value and determine the reasonableness of their answer.
• Use I=prt to find the missing value and determine the reasonableness of their answer.

Suggested materials:
• iReady grade 7, lesson 20</td><td><u>AKSS</u>
7.RP.3
<u>Mathematical Practices</u>
1, 2, 3, 4, 5, 6, 7, 8</td></tr>
<tr><td>Suggested Activities, Materials, and Resources:</td><td colspan="2">• Perimeter/circumference - How much fencing do you need to buy? How much space to turn your boat around?
• Area - How much paint/flooring do you need to buy?
• Volume - How much water is in the pool? How big of a container do you need for storage?
• Surface Area - How much wrapping paper do you need?
• iReady grade 3, lesson 15
• iReady grade 3, lesson 16
• iReady grade 3, lesson 32
• iReady grade 4, lesson 16
• iReady grade 5, lesson 1
• iReady grade 5, lesson 2
• iReady grade 5, lesson 3
• iReady grade 5, lesson 20
• iReady grade 6, lesson 1
• iReady grade 6, lesson 2
• iReady grade 6, lesson 3
• iReady grade 7, lesson 6
• iReady grade 7, lesson 16
• iReady grade 7, lesson 20
• iReady grade 7, lesson 25
• iReady grade 7, lesson 26
• iReady grade 8, lesson 26
• iReady grade 8, lesson 27
• iReady grade 8, lesson 28</td></tr>
</table>

FINANCIAL

Graduate-Level Competency:
M3 – Reasoning and Strategic Thinking: The learner will use evidence to support authentic application of concepts and support mathematical arguments.
M5 – Algebraic Functions, Patterns and Relations: The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
M3.7-8.2 **M5.7-8.1**	**Must be Covered:** The learner will: • Find unit rates and rate of change, and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 6, lesson 16 • *iReady* grade 7, lesson 2 • *iReady* grade 7, lesson 5	**AKSS** 6.RP.2, 7.RP.1 **Mathematical Practices** 1, 2, 3, 4, 5, 6, 7
	Must be Covered: The learner will: • Find percent of increase/decrease and determine the reasonableness of their answer. • Find mark-ups and discounts and determine the reasonableness of their answer. • Calculate final costs (including sales tax and tips) and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 7, lesson 21	**AKSS** 6.NS.5, 7.RP.3 **Mathematical Practices** 1, 2, 3, 4, 5, 6, 7
Suggested Activities, Materials, and Resources:	• Best buys • Shopping • Restaurants • *iReady* grade 6, lesson 16 • *iReady* grade 7, lesson 2 • *iReady* grade 7, lesson 5 • *iReady* grade 7, lesson 21	

COORDINATE PLANE

Graduate-Level Competency:
M5 – Algebraic Functions, Patterns and Relations: The learner will utilize patterns, relations, and functions to compare, interpret, and analyze situations.

Course/ Grade Competency	Content Objectives	Standards
M5.7-8.1	**Must be Covered:** The learner will: • Correctly label the x-axis and y-axis on the coordinate plane. • Correctly graph ordered pairs on the coordinate plane. • Correctly label the quadrants. **Can be Covered:** The learner will: • Find the slope and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 5, lesson 31 • *iReady* grade 6, lesson 11	**AKSS** 6.NS.8 **Mathematical Practices** 1, 3, 5, 6
Suggested Activities, Materials, and Resources:	• Battleship - Graph on the coordinate plane. • Coordinate plan – picture graphing • Slope – roof, steps, ramps • *iReady* grade 5, lesson 31 • *iReady* grade 6, lesson 11	

STATISTICS

Graduate-Level Competency:
M3 – Reasoning and Strategic Thinking: The learner will use evidence to support authentic application of concepts and support mathematical arguments.
M7 – Data, Analysis, Probability, and Statistics: The learner will apply statistical methods to summarize, represent, analyze, and interpret data.

Course/ Grade Competency	Content Objectives	Standards
M7.3-4.1	**Must be Covered:** The learner will: • Use circle graphs (pie charts). • Use histograms. Suggested materials: • *iReady* grade 6, lesson 30	**AKSS** 6.SP.4 **Mathematical Practices** 1, 2, 3, 5, 6
M3.7-8.1 **M3.7-8.2**	**Must be Covered:** The learner will: • Calculate mean, median, and mode, and determine the reasonableness of their answer.	**AKSS** 6.SP.3 **Mathematical Practices** 1, 2, 3, 5, 6
M7.7-8.1	**Must be Covered:** The learner will: • Find probability and odds, and determine the reasonableness of their answer. Suggested materials: • *iReady* grade 7, lesson 30	**AKSS** 6.SP.6, 6.SP.7, 7.SP.1, 7.SP.5, 7.SP.6, 7.SP.7, 7.SP.8 **Mathematical Practices** 1, 2, 3, 5, 6
Suggested Activities, Materials, and Resources:	• *iReady* grade 6, lesson 30 • *iReady* grade 7, lesson 30	