Mathematics I, Semester A

Course Overview

Mathematics I builds students' command of geometric knowledge and linear and exponential relationships. Students learn through discovery and application, developing the skills they need to break down complex challenges and demonstrate their knowledge in new situations.

Course topics include relationships between quantities; linear and exponential relationships; reasoning with equations; descriptive statistics; congruence, proofs, and constructions; and connecting algebra and geometry through coordinates.

This course supports all students as they develop computational fluency and deepen conceptual understanding. Students begin each lesson by discovering new concepts through guided instruction, and then confirm their understanding in an interactive, feedback-rich environment. Modeling activities equip students with tools for analyzing a variety of real-world scenarios and mathematical ideas. Journaling activities allow students to reason abstractly and quantitatively, construct arguments, critique reasoning, and communicate precisely. Performance tasks prepare students to synthesize their knowledge in novel, real-world scenarios and require that they make sense of multifaceted problems and persevere in solving them.

This course is built to state standards.

Course Components and Grading Rubric

The table gives a breakdown of the weight for each component in the course. Weight represents the percentage of the total score coming from each activity.

Course Components	Count	Weight
Pretest. *A pretest is an optional assessment, typically designed for credit recovery. If a student shows mastery of a lesson objective, the student may be automatically exempted from the upcoming activities associated with the mastered objective. Each passing pretest grade is entered into the gradebook.*	6	0%
Practice. *A practice activity provides instruction similar to that found in a study so that students can practice or review skills necessary to complete their assignment with mastery.*	6	10%
Discussion. *A discussion activity is an opportunity for students to collaborate with their peers. This activity gives students the opportunity to practice speaking and listening in a clear and logical manner and to receive feedback from peers.*	6	5%

Course Components	Count	Weight
Journal. *A journal is a short reflective writing exercise that encourages students to connect historical events and ideas to their own lives and circumstances.*	6	5%
Project. *A project is a hands-on investigation that extends over several weeks.*	1	5%
Mastery Test. *A mastery test is a computer-scored lesson-level summative assessment.*	27	35%
Posttest. *A posttest appears at the end of each unit.*	6	15%
End-of-Semester Test. *An end-of-semester test (EOS) appears at the end of each course.*	1	10%
Teacher-Graded Posttest. *A posttest that prompts students for written responses appears at the end of each unit.*	6	15%
Total	**65**	**100%**

**Teachers may manually adjust these weights if desired, per district grading requirements.*

UNIT 1: SOLVING EQUATIONS AND INEQUALITIES

Lesson and Duration	Description
Pretest: Solving Equations and Inequalities *40 minutes*	Complete the pretest (optional).
Solving Equations and Inequalities: Unit Overview *1 minute*	Read the unit overview.
LESSON 1 **Algebraic Properties and Expressions: Lesson Overview** *5 minutes*	Read the lesson objectives.
Algebraic Properties and Expressions: Study *45 minutes*	Translate verbal descriptions to mathematical expressions, write expressions to model real-world situations, and evaluate expressions using algebraic properties.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Algebraic Properties and Expressions: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.

Lesson and Duration	Description
LESSON 2 **Solving Linear Equations: Lesson Overview** *5 minutes*	Read the lesson objectives.
Solving Linear Equations: Study *45 minutes*	Review how to isolate the variable and solve simple equations with addition, subtraction, multiplication and division.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Solving Linear Equations: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
Practice: Modeling: Solving Linear Equations *45 minutes*	Model and solve a real-world problem.
LESSON 3 **Solving Multistep Linear Equations: Lesson Overview** *5 minutes*	Read the lesson objectives.
Solving Multistep Linear Equations: Study *45 minutes*	Solve multistep equations, including equations that have no solutions, one solution, or an infinite number of solutions. Write and solve equations that model real-world situations.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Solving Multistep Linear Equations: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
LESSON 4 **Solving Linear Inequalities: Lesson Overview** *5 minutes*	Read the lesson objectives.
Solving Linear Inequalities: Study *45 minutes*	Solve multistep inequalities, including those that involve collecting like terms.

Lesson and Duration	Description
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Solving Linear Inequalities: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
LESSON 5 **Literal Equations: Lesson Overview** *5 minutes*	Read the lesson objectives.
Literal Equations: Study *45 minutes*	Learn how to solve literal equations, including formulas, for a particular variable.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Literal Equations: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
LESSON 6 **Measurement and Units: Lesson Overview** *5 minutes*	Read the lesson objectives.
Measurement and Units: Study *45 minutes*	Explore the ideas of precision and accuracy in measurement. Solve problems involving a single unit conversion and those requiring multiple conversions.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Measurement and Units: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
Journal: Measurement and Units *45 minutes*	Construct arguments and critique the reasoning of others as you write about topics in algebra.
LESSON 7 **Performance Task: Lesson Overview** *5 minutes*	Read the lesson objectives.

Lesson and Duration	Description
Problem Solving with Inequalities: Study *45 minutes*	Learn strategies for solving a variety of application problems related to topics in this unit.
Project: Performance Task: A Trade Show Booth *2 hours*	Use your knowledge, skills, and resources to make sense of and persevere in solving a real-world problem.
UNIT 1 WRAP-UP **Solving Equations and Inequalities: Review** *30 minutes*	Check your understanding of the topics in this unit.
Prepare to Discuss: In Your Own Words *5 minutes*	Prepare for a discussion.
Discuss: In Your Own Words *40 minutes*	Join a three- to five-question discussion to practice methods learned in this unit.
Posttest: Solving Equations and Inequalities *50 minutes*	Take a computer-scored test to check what you have learned in this unit.
Teacher-Graded Posttest: Solving Equations and Inequalities *50 minutes*	Take a teacher-scored test to check what you have learned in this unit.

UNIT 2: FUNCTIONS

Lesson and Duration	Description
Pretest: Functions *40 minutes*	Complete the pretest (optional).
Functions: Unit Overview *1 minute*	Read the unit overview.
LESSON 1 **Domain and Range: Lesson Overview** *5 minutes*	Read the lesson objectives.

Lesson and Duration	Description
Domain and Range: Study *45 minutes*	Understand the meanings of the domain and range of a function. Use function notation and evaluate a function for a given value in its domain.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Domain and Range: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
Journal: Domain and Range *45 minutes*	Construct arguments and critique the reasoning of others as you write about topics in algebra.
LESSON 2 **Identifying Functions: Lesson Overview** *5 minutes*	Read the lesson objectives.
Identifying Functions: Study *45 minutes*	Determine whether relations represented by graphs or tables of values are functions. Identify the domain and range of a function from an input-output table.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Identifying Functions: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
LESSON 3 **Graphs of Functions: Lesson Overview** *5 minutes*	Read the lesson objectives.
Graphs of Functions: Study *45 minutes*	Determine the domain and range of a function from its graph. Identify sections where a graph is increasing, decreasing, or remaining constant.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Graphs of Functions: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.

Lesson and Duration	Description
Practice: Modeling: Graphs of Functions *45 minutes*	Model and solve a real-world problem.
LESSON 4 **Adding and Subtracting Functions: Lesson Overview** *5 minutes*	Read the lesson objectives.
Adding and Subtracting Functions: Study *45 minutes*	Learn how to add and subtract functions.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Adding and Subtracting Functions: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
UNIT 2 WRAP-UP **Functions: Review** *30 minutes*	Check your understanding of the topics in this unit.
Prepare to Discuss: Relating to Functions *5 minutes*	Prepare for a discussion.
Discuss: Relating to Functions *40 minutes*	Join a three- to five-question discussion to practice methods learned in this unit.
Posttest: Functions *50 minutes*	Take a computer-scored test to check what you have learned in this unit.
Teacher-Graded Posttest: Functions *50 minutes*	Take a teacher-scored test to check what you have learned in this unit.

UNIT 3: LINEAR EQUATIONS

Lesson and Duration	Description
Pretest: Linear Equations *40 minutes*	Complete the pretest (optional).

Lesson and Duration	Description
Linear Equations: Unit Overview *1 minute*	Read the unit overview.
LESSON 1 **Slope: Lesson Overview** *5 minutes*	Read the lesson objectives.
Slope: Study *45 minutes*	Learn how to find the slope of a line, define rise and run, and measure rates of change.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Slope: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
Journal: Slope *45 minutes*	Construct arguments and critique the reasoning of others as you write about topics in algebra.
LESSON 2 **Slope-Intercept Equation of a Line: Lesson Overview** *5 minutes*	Read the lesson objectives.
Slope-Intercept Equation of a Line: Study *45 minutes*	Learn to use the slope and *y*-intercept of a line to write its slope-intercept equation. Understand the meaning of the slope and *y*-intercept in slope-intercept equations that model real-world situations.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Slope-Intercept Equation of a Line: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
Practice: Modeling: Slope-Intercept Equation of a Line *45 minutes*	Model and solve a real-world problem.
LESSON 3 **Graphing and Manipulating y = mx + b: Lesson Overview** *5 minutes*	Read the lesson objectives.

Lesson and Duration	Description
Graphing and Manipulating y = mx + b: Study *45 minutes*	Practice graphing and manipulating linear equations in the form $y = mx + b$.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Graphing and Manipulating y = mx + b: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
LESSON 4 **Point-Slope Equation of a Line: Lesson Overview** *5 minutes*	Read the lesson objectives.
Point-Slope Equation of a Line: Study *45 minutes*	Write point-slope equations for lines given a point and the slope or two points. Rewrite point-slope equations in slope-intercept form.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Point-Slope Equation of a Line: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
LESSON 5 **Parallel and Perpendicular Lines: Lesson Overview** *5 minutes*	Read the lesson objectives.
Parallel and Perpendicular Lines: Study *45 minutes*	Learn about parallel and perpendicular lines and the relationships between their slopes. Write equations for lines perpendicular and parallel to given lines.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Parallel and Perpendicular Lines: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.

Lesson and Duration	Description
LESSON 6 **Linear Inequalities: Lesson Overview** *5 minutes*	Read the lesson objectives.
Linear Inequalities: Study *45 minutes*	Learn how to graph the half-planes that represent solutions for linear inequalities.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Linear Inequalities: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
UNIT 3 WRAP-UP **Linear Equations: Review** *30 minutes*	Check your understanding of the topics in this unit.
Prepare to Discuss: A Slippery Slope *5 minutes*	Prepare for a discussion.
Discuss: A Slippery Slope *40 minutes*	Join a three- to five-question discussion to practice methods learned in this unit.
Posttest: Linear Equations *50 minutes*	Take a computer-scored test to check what you have learned in this unit.
Teacher-Graded Posttest: Linear Equations *50 minutes*	Take a teacher-scored test to check what you have learned in this unit.

UNIT 4: SYSTEMS OF LINEAR EQUATIONS

Lesson and Duration	Description
Pretest: Systems of Linear Equations *40 minutes*	Complete the pretest (optional).
Systems of Linear Equations: Unit Overview *1 minute*	Read the unit overview.

Lesson and Duration	Description
LESSON 1 **Two-Variable Systems: Graphing: Lesson Overview** *5 minutes*	Read the lesson objectives.
Two-Variable Systems: Graphing: Study *45 minutes*	Use graphing to solve two-variable systems of linear equations. Explore what it means for a linear system to have no solution, one solution, or an infinite number of solutions.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Two-Variable Systems: Graphing: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
LESSON 2 **Two-Variable Systems: Substitution: Lesson Overview** *5 minutes*	Read the lesson objectives.
Two-Variable Systems: Substitution: Study *45 minutes*	Use substitution to solve two-variable systems of linear equations.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Two-Variable Systems: Substitution: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
LESSON 3 **Two-Variable Systems: Elimination: Lesson Overview** *5 minutes*	Read the lesson objectives.
Two-Variable Systems: Elimination: Study *45 minutes*	Use elimination to solve two-variable systems of linear equations.

Lesson and Duration	Description
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Two-Variable Systems: Elimination: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
Journal: Two-Variable Systems: Elimination *45 minutes*	Construct arguments and critique the reasoning of others as you write about topics in algebra.
LESSON 4 **Two-Variable Systems of Inequalities: Lesson Overview** *5 minutes*	Read the lesson objectives.
Two-Variable Systems of Inequalities: Study *45 minutes*	Use graphing to solve two-variable systems of linear inequalities. Use what you know about solving systems of inequalities to solve a real-world problem where there are constraints (limitations) that restrict your options.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Two-Variable Systems of Inequalities: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
Practice: Modeling: Two-Variable Systems of Inequalities *45 minutes*	Model and solve a real-world problem.
UNIT 4 WRAP-UP **Systems of Linear Equations: Review** *30 minutes*	Check your understanding of the topics in this unit.
Prepare to Discuss: What's the Solution? *5 minutes*	Prepare for a discussion.
Discuss: What's the Solution? *40 minutes*	Join a three- to five-question discussion to practice methods learned in this unit.

Lesson and Duration	Description
Posttest: Systems of Linear Equations *50 minutes*	Take a computer-scored test to check what you have learned in this unit.
Teacher-Graded Posttest: Systems of Linear Equations *50 minutes*	Take a teacher-scored test to check what you have learned in this unit.

UNIT 5: EXPONENTS AND EXPONENTIAL FUNCTIONS

Lesson and Duration	Description
Pretest: Exponents and Exponential Functions *40 minutes*	Complete the pretest (optional).
Exponents and Exponential Functions: Unit Overview *1 minute*	Read the unit overview.
LESSON 1 **Exponents: Lesson Overview** *5 minutes*	Read the lesson objectives.
Exponents: Study *45 minutes*	Evaluate exponential expressions. Use properties to rewrite exponential expressions, including those with rational exponents, and to rewrite radicals using fractional exponents.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Exponents: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
LESSON 2 **Exponential Functions: Lesson Overview** *5 minutes*	Read the lesson objectives.

Lesson and Duration	Description
Exponential Functions: Study *45 minutes*	Define an exponential function and explore applications of exponential functions, such as exponential growth and decay. Interpret the parts of an exponential expression that represents a real-world context.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Exponential Functions: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
Practice: Modeling: Exponential Functions *45 minutes*	Model and solve a real-world problem.
LESSON 3 **Graphs of Exponential Functions: Lesson Overview** *5 minutes*	Read the lesson objectives.
Graphs of Exponential Functions: Study *45 minutes*	Learn about graphs of exponential functions with different bases. Identify the domain, range and *y*-intercept of an exponential function from its equation and from its graph. Use graphs to evaluate exponential functions for given *x*-values.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Graphs of Exponential Functions: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
Journal: Graphs of Exponential Functions *45 minutes*	Construct arguments and critique the reasoning of others as you write about topics in algebra.
UNIT 5 WRAP-UP **Exponents and Exponential Functions: Review** *30 minutes*	Check your understanding of the topics in this unit.

Lesson and Duration	Description
Prepare to Discuss: Exponential Potential *5 minutes*	Prepare for a discussion.
Discuss: Exponential Potential *40 minutes*	Join a three- to five-question discussion to practice methods learned in this unit.
Posttest: Exponents and Exponential Functions *50 minutes*	Take a computer-scored test to check what you have learned in this unit.
Teacher-Graded Posttest: Exponents and Exponential Functions *50 minutes*	Take a teacher-scored test to check what you have learned in this unit.

UNIT 6: SEQUENCES AND FUNCTIONS

Lesson and Duration	Description
Pretest: Sequences and Functions *40 minutes*	Complete the pretest (optional).
Sequences and Functions: Unit Overview *1 minute*	Read the unit overview.
LESSON 1 **Arithmetic Sequences: Lesson Overview** *5 minutes*	Read the lesson objectives.
Arithmetic Sequences: Study *45 minutes*	Learn about arithmetic sequences, explicit and recursive formulas, and finding the next term in a sequence.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Arithmetic Sequences: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.

Lesson and Duration	Description
Journal: Arithmetic Sequences *45 minutes*	Construct arguments and critique the reasoning of others as you write about topics in algebra.
LESSON 2 **Geometric Sequences: Lesson Overview** *5 minutes*	Read the lesson objectives.
Geometric Sequences: Study *45 minutes*	Explore geometric sequences as sets of numbers in which the ratio between any two consecutive numbers is a constant. Compare how the recursive formula and the explicit formula allow you to find the value of any term in a geometric sequence.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Geometric Sequences: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
Practice: Modeling: Geometric Sequences *45 minutes*	Model and solve a real-world problem.
LESSON 3 **Understanding Number Sequences: Lesson Overview** *5 minutes*	Read the lesson objectives.
Understanding Number Sequences: Study *45 minutes*	Learn about applications and models of arithmetic, geometric, and special sequences.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Understanding Number Sequences: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.

Lesson and Duration	Description
LESSON 4 **Exponential and Linear Growth: Lesson Overview** *5 minutes*	Read the lesson objectives.
Exponential and Linear Growth: Study *45 minutes*	Learn about the connections between linear and exponential functions and arithmetic and geometric sequences.
Practice Problems: Checkup *25 minutes*	Check your understanding of the lesson.
Exponential and Linear Growth: Mastery Test *25 minutes*	Take a quiz to check your understanding of what you have learned.
UNIT 6 WRAP-UP **Sequences and Functions: Review** *30 minutes*	Check your understanding of the topics in this unit.
Prepare to Discuss: What's the Difference? *5 minutes*	Prepare for a discussion.
Discuss: What's the Difference? *40 minutes*	Join a three- to five-question discussion to practice methods learned in this unit.
Posttest: Sequences and Functions *50 minutes*	Take a computer-scored test to check what you have learned in this unit.
Teacher-Graded Posttest: Sequences and Functions *50 minutes*	Take a teacher-scored test to check what you have learned in this unit.

SEMESTER WRAP-UP

Lesson and Duration	Description
Semester Review: Review *30 minutes*	Prepare for the final exam by reviewing key concepts and skills.

Lesson and Duration	Description
End-of-Semester Test: Semester Exam *50 minutes*	Take a computer-scored exam to demonstrate your mastery of concepts and skills covered in this semester.