



Teacher's Guide

Algebra 1

Semester A

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Please refer to the [Introduction to Edmentum Courseware](#) for general information about Edmentum’s online courses, course components, and instructional implementation models.

Course Overview

This course is designed to enable all students at the high school level to develop a deep understanding of the math objectives identified in the course pacing guide detailed below. The course is based on a modern understanding of student learning in mathematics and on the [Common Core State Standards for Mathematics](#). This course was designed with each portion of each standard in mind to ensure precise and complete standards alignment.

For more information about standards coverage, consult this [coverage spreadsheet](#), which correlates lessons with the Common Core State Standards for Mathematics.

Instructional Approach

This course is designed to place an emphasis on inquiry learning and regular practice of mathematical skills.



Inquiry

- All tutorials start with a warm-up exercise of one to three questions. These warm-up activities enable students to draw from their past experience and to review techniques and concepts that support the conceptual and procedural development of the tutorial.
- Notebook activities are woven throughout the tutorials. They ask students to open the Notebook and record observations or form hypotheses about how the math they are studying works. After learning about the subject matter, students then review their earlier entries and reflect on how their previous understanding compares to their current understanding.
- Lesson Activities in this course exercise learning objectives that require ongoing attention throughout the student's education. Most Lesson Activities use a scaffolded inquiry approach to enable students to develop their own initial understanding of the content and, in the process, help them exercise fundamental math practices.



Practice

- Practice questions are available to students for every lesson. By practicing their skills, students can identify areas of weakness and do a targeted review of the material before taking the mastery test.

- Practice is also available before unit and semester tests. These practice sessions draw practice questions uniformly from each lesson in the unit or semester. Students may practice with items drawn from all unit or semester lessons or select individual lessons for practice.
- Teachers may preview practice items for a unit or semester by previewing the lesson-level practice. Alternately, teachers can review practice items as a learner.
- Each lesson also includes a set of guided notes, which may be printed out or filled in electronically. The guided notes summarize the content of a given lesson, ensuring comprehensive student preparation for each lesson's mastery test.
- Many lessons also include printable worksheets. Like the guided notes, these worksheets may also be printed out or filled in electronically. The worksheets serve as extension activities through which students can explore topics closely related to that of a given lesson.

Interactive Tools

This course is technologically enriched, making frequent use of a wide variety of interaction types to help students clarify their understanding. Interactions include exploratory items, technology-enhanced items, and graphing tools.

- **Exploratory items.** Many interactions allow students to explore topics without worrying about “getting the right answer.” At key points in tutorials, students have a chance to explore how changing parameters in equations will affect the equation's graph. They can also use drawing tools to sketch their own version of a graph, as well as learn detailed information about a topic by clicking different parts of a related image. These interactions do not require students to submit any work and are not scored or graded in any way.
- **Technology-enhanced items.** Assessment questions in this course come in a wide variety of styles and formats. They're employed to check student understanding and provide full explanations in tutorials and to assess student understanding in lesson, unit, and course-level assessments. These technology-enhanced questions ask students to perform a wide variety of tasks, from drawing a graph of a function to matching equations to the real-life scenarios they model. Technology-enhanced items can even assess students on their ability to answer questions with a correctly formed mathematical expression, equation, or inequality, employing an easy-to-use interface that supports full mathematical formatting.
- **Graphing tools.** This course features a pair of powerful graphing tools that are used throughout the course. The Data Plot tool can graph a set of 1-D data as a histogram or as a box plot, so students can easily see and compare two different visualizations of their data sets. The Graph tool enables students to plot both data

and mathematical relationships (including inequalities) on an x - y coordinate system. Notably, the Graph tools enable students to plot both data and relationships at the same time for x - y data analysis and mathematical modeling.

- **Video.** Videos introduce and illustrate concepts and procedures. These videos often walk students through a problem, explaining each step until the problem is solved.

Summary

Taken together, the elements of this course are designed to help students learn in a multifaceted but straightforward way. The curriculum is relevant and highly engaging for students while being straightforward for teachers to manage.

Pacing

Edmentum offers automatic pacing for this course. When creating a new class assignment or updating an existing assignment, teachers can enable automatic pacing by defining start and end dates for course administration. The following pacing guide may also be used as a reference.

Curriculum Contents and Pacing Guide

This pacing guide lists the title and the primary content objective of each lesson. For more information about each lesson and activity, consult this [coverage spreadsheet](#), which correlates lessons with the Common Core State Standards for Mathematics.

Notice that column B lists the standards and column C gives the total number of lessons or other activities that address each standard. Across the top of the spreadsheet, you'll find the title of each lesson and the unit the lesson resides in. In the cells under the titles, a number 1 indicates that a Common Core State Standard is addressed by that title.

This semester is divided into seven units spread over 90 days. The pacing guide provides a general timeline for presenting each unit. It is designed to fit your class schedule and is adjustable. The guide is based on a typical 180-day school year with 90 days per semester.

Unit 1: The Real Number System

Summary

This unit is designed to provide students with the skills to use linear expressions and equations to describe and solve problems. Students will practice adding and subtracting polynomials of degree 1 in real-world contexts. Then they will solve linear equations in one variable, applying the distributive property where necessary. Next they will rewrite and simplify numerical radical expressions involving square roots. They will also examine the results of adding or multiplying rational and irrational numbers. At the end of the unit, students will apply what they have learned to explain mathematical ideas using precise language and symbols.

Day	Activity/Objective	Type
1 day: 1	Syllabus and Student Orientation <i>Review the Student Orientation and Course Syllabus at the beginning of this course.</i>	Course Orientation
2 days: 2–3	Expressions <i>Use expressions to model and solve problems.</i>	Lesson
2 days: 4–5	Linear Equations <i>Solve one-step and two-step linear equations in one variable.</i>	Lesson

Day	Activity/Objective	Type
2 days: 6–7	Radical Expressions <i>Rewrite numerical radical expressions involving square roots.</i>	Lesson
2 days: 8–9	Relationships Between Real Numbers <i>Explain the result of adding or multiplying rational and irrational numbers.</i>	Course Activity
3 days: 10–12	Unit Activity and Discussion—Unit 1	Unit Activity/ Discussion
1 day: 13	Posttest—Unit 1	Assessment

Unit 2: Linear Equations

Summary

In this unit, students will develop the skills necessary to solve linear equations in real-world and mathematical contexts. They will solve linear equations in one variable using multiple steps and the distributive property. They will solve linear equations and formulas that model real-world relationships. At the end of the unit, students will extend their understanding of linear relationships to linear inequalities and graph the solution sets of linear inequalities.

Day	Activity/Objective	Type
2 days: 14–15	Solving Linear Equations <i>Solve multistep linear equations in one variable.</i>	Lesson
2 days: 16–17	Solving Advanced Linear Equations <i>Solve multistep linear equations in one variable by applying the distributive property.</i>	Lesson
2 days: 18–19	Solving Literal Equations <i>Solve literal equations and formulas for a specified variable.</i>	Lesson
3 days: 20–22	Solving Linear Inequalities <i>Solve multistep linear inequalities in one variable and graph the solution set.</i>	Lesson
1 day: 23	Unit Discussion—Unit 2	Discussion

Day	Activity/Objective	Type
1 day: 24	Posttest—Unit 2	Assessment

Unit 3: Functions

Summary

In this unit, students will become familiar with how functions can describe relationships. They will identify variables in real-world situations and use graphs to model the relationships. They will decide whether relationships represented verbally, tabularly, graphically, or symbolically define a function. They will also use function notation to describe relationships between quantities and evaluate functions expressed in function notation when given one or more elements in their domains. They will write an expression for the inverse of an equation and solve an equation for a simple function that has an inverse. Finally, students will apply what they have learned to describe relationships between quantities with function notation and interpret function notation accurately to solve problems.

Day	Activity/Objective	Type
2 days: 25–26	Graphing Relations <i>Identify variables in real-world situations and model the relationships graphically.</i>	Lesson
2 days: 27–28	Functions <i>Identify functions in multiple representations and relate the domains and ranges.</i>	Lesson
2 days: 29–30	Function Notation <i>Use function notation to describe relationships between quantities and interpret function notation accurately to solve problems.</i>	Lesson
3 days: 31–33	Inverse Functions <i>Determine inverses of functions.</i>	Lesson
3 days: 34–36	Unit Activity and Discussion—Unit 3	Unit Activity/ Discussion
1 day: 37	Posttest—Unit 3	Assessment

Unit 4: Linear Relationships

Summary

In this unit, students will examine how linear functions, equations, and graphs describe the characteristics of linear relationships. They will determine the slope of a line and describe the slope of a linear equation graphically. They will write linear functions and equations from different representations and identify key features of linear functions and equations. They will also describe the effects on the graph of the function $f(x) = x$ when $f(x)$ undergoes a variety of transformations. In the activity that ends this unit, students will write linear equations in two variables to represent real-world problems and compare their key features.

Day	Activity/Objective	Type
2 days: 38–39	Slope and Graphing <i>Determine the slope of a line and graph a linear equation in two variables.</i>	Lesson
3 days: 40–42	Writing Linear Functions and Equations <i>Write linear functions and equations in two variables and graph them to display the relationship.</i>	Lesson
3 days: 43–45	Linear Function Transformations <i>Determine the effects of transforming the linear parent function and identify key features of linear functions.</i>	Lesson
3 days: 46–48	Unit Activity and Discussion—Unit 4	Unit Activity/ Discussion
1 day: 49	Posttest—Unit 4	Assessment

Unit 5: Special Linear Relationships

Summary

In this unit, students will extend their knowledge of linear relationships to special mathematical cases, real-world situations, data analyses, and linear inequalities. They will begin by writing linear equations given specific information about a line, such as a point along the line and the equation of a line that runs perpendicular to it. They will create different representations of direct variation situations. Then they will represent real-world data using scatter plots and the equation of the line of best fit. Students will compare and contrast correlation and causation in real-world problems. They will also evaluate the reasonableness of mathematical models and use them to make predictions in real-world

contexts. They will write and graph linear inequalities given different representations. At the end of the unit, students will draw a scatter plot and the line of best fit to analyze a situation.

Day	Activity/Objective	Type
2 days: 50–51	Special Lines <i>Write equations of parallel, perpendicular, vertical, and horizontal lines.</i>	Lesson
2 days: 52–53	Direct Variation <i>Represent direct variation situations with graphs and equations.</i>	Lesson
2 days: 54–55	Representing Data <i>Represent data using scatter plots and the equation of the line of best fit.</i>	Lesson
2 days: 56–57	Using Models from Data <i>Evaluate the reasonableness of mathematical models and use them to make predictions.</i>	Lesson
2 days: 58–59	Linear Inequalities <i>Write and graph linear inequalities in two variables.</i>	Lesson
3 days: 60–62	Unit Activity and Discussion—Unit 5	Unit Activity/ Discussion
1 day: 63	Posttest—Unit 5	Assessment

Unit 6: Systems of Linear Equations and Inequalities

Summary

In this unit, students will learn that many situations can be described through systems of linear equations and inequalities. They will write and graph systems of two linear equations given a verbal description. They will also solve systems of linear equations algebraically using substitution and elimination. Students will apply what they have learned to linear inequalities by graphing the solution set of systems of two linear inequalities in two variables on the coordinate plane. Finally, students will write and solve a system of linear equations that represents real-world data.

Day	Activity/Objective	Type
2 days: 64–65	Systems of Linear Equations <i>Write and graph systems of linear equations to determine the solutions.</i>	Lesson
2 days: 66–67	Writing and Solving Systems Using Substitution <i>Write and solve systems of linear equations algebraically using substitution.</i>	Lesson
2 days: 68–69	Writing and Solving Systems Using Elimination <i>Write and solve systems of linear equations algebraically using elimination.</i>	Lesson
2 days: 70–71	Systems of Inequalities <i>Represent the solution of a system of two linear inequalities graphically and determine solutions.</i>	Lesson
3 days: 72–74	Unit Activity and Discussion—Unit 6	Unit Activity/ Discussion
1 day: 75	Posttest—Unit 6	Assessment

Unit 7: Descriptive Statistics

Summary

This unit introduces students to different ways of representing, analyzing, and comparing data sets. Students will learn how to represent data with dot plots, box plots, and histograms. Students will examine how shape, center, and spread describe a data set and allow them to compare multiple data sets. They will also summarize categorical data for two categories in two-way frequency tables and interpret relative frequencies in the context of the data. Finally, students will analyze, interpret, and justify conclusions from a set of data.

Day	Activity/Objective	Type
4 days: 76–79	Visual Representations of Data <i>Represent data with dot plots, box plots, and histograms.</i>	Lesson
3 days: 80–82	Comparing Data Sets <i>Compare multiple data sets using statistics and interpret differences in shape, center, and spread.</i>	Lesson

Day	Activity/Objective	Type
2 days: 83–84	Two-Way Frequency Tables <i>Construct two-way frequency tables for categorical data and interpret measures and associations within the data, including relative frequencies.</i>	Lesson
3 days: 85–87	Unit Activity and Discussion—Unit 7	Unit Activity/ Discussion
1 day: 88	Posttest—Unit 7	Assessment
1 day: 89	End-of-Semester Review	
1 day: 90	End-of-Semester Test	Assessment