

**Mathematics Grade 8 Syllabus
2024-2025**

General Course Information:

Course Name: Mathematics Grade 8
Semester and Year: Fall 2024 and Winter 2025
Adopted Textbook: Big Ideas Learning;
Big Ideas Math Grade 8
ISBN: 978-1-64432-603-9

Credit offered: 1.0 credit
Instructor/Contact Information:
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Course Description: In Grade 8, content is organized into four Alabama Content Areas outlined below: Number Systems and Operations; Algebra and Functions; Data Analysis, Statistics, and Probability; and Geometry and Measurement. Related standards are grouped into clusters, which are listed below each content area.

Email is the best way to reach me at tpairrett@chiltonboe.com. If an email is sent after school hours, it may be answered the following school morning. Weekly assignments and all documents can be found in Google Classroom. Most assignments will be in Big Ideas online.

Prerequisite: N/A

Instructional and Technology Information

Required Textbooks: 978-1-64432-603-9 **Big Ideas Math Modeling Real Life Grade 8**

Specific Technologies/Software/Programs used in this course: Big Ideas Math Online (accessed through Clever) and Google Classroom (code sozl5me)

Grading: Major grades (tests, projects, research papers, etc.) are 75 points or higher. Minor grades (quizzes, daily classroom grades, homework, etc.) are 74 points and below. (Homework is 5 points each. It is due at the beginning of the next class.)

Course Policies and Procedures:

Attendance/Missed Work -An absence is defined as non-attendance in a regularly scheduled class or activity. To be counted present, a student must be present more than 50% of the scheduled class time. Every student, upon return to school should bring a verifiable written excuse from home or doctor for each absence and present it to the principal or designee no later than 2 days after his/her return or absences will be recorded as unexcused. Grades 9-12: One parent note can excuse no more than three consecutive days. If a student is absent for any reason as defined as excused in the student handbook, he/she shall be allowed to make up all major assignments and other work missed during said absence at the time agreeable to the teacher. At the secondary level, students are responsible for contacting the teacher to arrange to make up the work.

Academic Integrity Statement - Students caught cheating on an assignment, test, or exam will receive no credit for the assignment/test. A zero will be given for the grade. Other disciplinary action may occur when deemed appropriate by the principal.

Expectations of classroom behavior -

1. Classroom Rules
 - A. Come to class prepared each day.
 - B. Follow all procedures and directions the first time they are given.
 - C. Be respectful of others and their property.
 - D. Keep our classroom clean.
2. Violation of Rules
 - A. Break detention or writing sets of multiplication tables
 - B. Lines or paragraphs
 - C. A phone call or notification letter of behavior to parents
 - D. Paddling or office referral

Positive Attitude -

- Actively listen, make good eye contact, and participate.
- Cooperate with your teacher and classmates.
- Be kind and encourage others.

Respect for All -

- Accept and respect everyone. Seek first to understand, then to be understood.
- Use positive words and body language

Integrity -

- Take responsibility for your actions
- Be honest.

Do the Right Thing

- Stop, think, and make good choices.
- Keep hands, feet, and objects to yourself.

Effort Towards Learning

- Pay attention and follow all directions the first time.
- Be prepared and on time. Put first things first.
- Give your best effort.

Phone Policy:

- Cell phones/electronic devices may only be used during class changes or after school. Devices may not be used in the lunchroom, classroom settings, or in restrooms.
- If a student is caught using a cell phone/electronic device during class time, a staff member will confiscate the device.
- Refusal to surrender the phone when asked is considered defiance. Defiance will result in disciplinary consequences, including suspension. Parents will be contacted.
- Filming/videoing or taking photos of individuals without the consent of a school board employee is an intermediate offense.
- If offense occurs during testing, the Board of Education will follow State Digital Policy, which may include suspension.

Netiquette statement - Students are responsible for good behavior when using school computer networks since communications on the network are often public in nature. General school rules for behavior and communication apply to using devices issued by the school or student-owned devices. Student-issued devices will follow the Chilton County Schools Digital Device Acceptable Use Agreement.

Course Outline/Schedule:

Chilton County Schools

2024-2025

Mathematics - 8th Grade Pacing Guide/Standards

Textbook: **Big Ideas Math: Modeling Real Life, Grade 8**

Publisher: Big Ideas Learning

ISBN: 9781642086737

Critical Standards

ALSDE Standards

1st 9 Weeks

Unit 1 - Integer Exponents: Properties

Rational Numbers, Irrational Numbers

Standard 8.1 - Rational Numbers

[8.NS.1.] Define the real number system as composed of rational and irrational numbers. a. Explain that every number has a decimal expansion; for rational numbers, the decimal expansion repeats or terminates. b. Convert a decimal expansion that repeats into a rational number.

Standard 8.3 - Understand Properties of Integer Exponents and Laws of Exponents [8.EE.1.]

Develop and apply properties of integer exponents to generate equivalent numerical and algebraic expressions.

Standard 8.5 - Scientific Notation

[8.EE.3.] Estimate and compare very large or very small numbers in scientific notation.

Example: Estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9 , and determine that the world population is more than 20 times larger.

Standard 8.6 - Computing with Scientific Notation

[8.EE.4.] Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used.

- Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities.
- Interpret scientific notation that has been generated by technology. (e.g., use millimeters per year for seafloor spreading).

Standard 8.4 - Square and Cube Roots

[8.EE.2.] Use square root and cube root symbols to represent solutions to equations.

- Evaluate square roots of perfect squares (less than or equal to 225) and cube roots of perfect cubes (less than or equal to 1000).
- Explain that the square root of a non-perfect square is irrational.

2nd 9 Weeks

Standard 8.2 - Estimating Irrational Numbers

[8.NS.2.] Locate rational approximations of irrational numbers on a number line, compare their sizes, and estimate the values of the irrational numbers.

Standard 8.11 - Solving Equations in One Variable

Solve multi-step linear equations in one variable, including rational number coefficients, and equations that require using the distributive property and combining like terms [8-EE7]

Standard 8.11a - Solutions to Equations

Determine whether linear equations in one variable have one solution, no solution, or infinitely many solutions of the form $x = a$, $a = a$, or $a = b$ (where a and b are different numbers) [8-EE7a]

Standard 8.11b - Solving Real-World Problems with Equations

Represent and solve real-world and mathematical problems with equations and interpret each solution in the

context of the problem. [8-EE7b]

Unit 2- Pythagorean Theorem, Volume of Cones, Cylinders and Spheres (19 Days) Standard 8.26 - Understanding the Pythagorean Theorem

[8.G.6.] Informally justify the Pythagorean Theorem and its converse.

Standard 8.27 - Applying the Pythagorean Theorem

Apply the Pythagorean Theorem to find the distance between two points in a coordinate plane. [8-G7]

Standard 8.28 - Finding Distance

Apply the Pythagorean Theorem to determine unknown side lengths of right triangles, including real-world applications[8-G8]

Standard 8.29 - Volume of Cones, Cylinders, and Spheres

[8.G.9.] Informally derive the formulas for the volume of cones and spheres by experimentally comparing the volumes of cones and spheres with the same radius and height to a cylinder with the same dimensions.

Standard 8.30 Use formulas to calculate the volumes of three-dimensional figures (cylinders, cones, and spheres) to solve real world problems

Unit 3 Linear Relationships: Slope, Linear Equations, and Systems

Standard 8.7 - Proportional

[8.EE.5.] Determine whether a relationship between two variables is proportional or non-proportional.

Standard 8.8 - Constant Rate of Change

[8.EE.5.] Graph proportional relationships.

a. Interpret the unit rate of a proportional relationship, describing the constant of proportionality as the slope of the graph which goes through the origin and has the equation $y = mx$ where m is the slope. Example: Compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

Standard 8.9 - Slope-Intercept Form

[8.EE.6.] Interpret $y = mx + b$ as defining a linear equation whose graph is a line with m as the slope and b as the y -intercept.

- Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in a coordinate plane.
- Given two distinct points in a coordinate plane, find the slope of the line containing the two points and explain why it will be the same for any two distinct points on the line.
- Graph linear relationships, interpreting the slope as the rate of change of the graph and the y -intercept as the initial value.
- Given that the slopes for two different sets of points are equal, demonstrate that the linear equations that include those two sets of points may have different y -intercepts.

Standard 8.10 - Compare proportional and non-proportional linear relationships represented in different ways (algebraically, graphically, numerically in tables, or by verbal descriptions) to solve real-world problems.

3rd 9 Weeks

Standard 8.12 - Simultaneous Linear Equations (12 days)

Solve systems of two linear equations in two variables by graphing and substitution.

[8-EE8] Standard 8.12a - Points of Intersection (Graphing)

Explain that the solution(s) of systems of two linear equations in two variables corresponds to points of intersection on their graphs because points of intersection satisfy both equations simultaneously.

[8-EE8a] Standard 8.12b - Real-World Problems

Interpret and justify the results of systems of two linear equations in two variables (one solution, no solution, or infinitely many solutions) when applied to real-world and mathematical problems.[8-EE8b] Example:

Given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.

Unit 4 Functions: Linear and Nonlinear Relationships**Standard 8.13 - Definition of a Function**

Determine whether a relation is a function, defining a function as a rule that assigns to each input (independent value) exactly one output (dependent value), and given a graph, table, mapping, or set of ordered pairs. [8-F1]

Standard 8.14 - Analyzing Linear Relationships

Evaluate functions defined by a rule or an equation, given values for the independent variable. For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change. [8-F2]

Standard 8.15 - Linear vs. Nonlinear Functions

[8.F.3] Compare properties of functions represented algebraically, graphically, numerically in tables, or by verbal descriptions. a. Distinguish between linear and nonlinear functions.

Example: The function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4), and (3,9), which are not on a straight line.

Standard 8.16 - Constructing a Linear Equation

Construct a function to model a linear relationship between two variables. a. Interpret the rate of change (slope) and initial value of the linear function from a description of a relationship or from two points in a table or graph. [8-F4]

Standard 8.17 - Qualitative Graphs

Analyze the relationship (increasing or decreasing, linear or nonlinear) between two quantities represented in a graph.[8-F5]

4th 9 Weeks

Unit 5- Geometric Figures: Rigid Transformations and Congruence Transformations, Similarity, and Angle Relationships

Standard 8.22 - Visual Exploration of Transformations

Verify experimentally the properties of rigid motions (rotations, reflections, and translations): lines are taken to lines, and line segments are taken to line segments of the same length; angles are taken to angles of the same measure; and parallel lines are taken to parallel lines.

a. Given a pair of two-dimensional figures, determine if a series of rigid motions maps one figure onto the other, recognizing that if such a sequence exists the figures are congruent; describe the transformation sequence that verifies a congruence relationship. [8-G1]

Standard 8.23 - Coordinates Effects of Transformations

Use coordinates to describe the effect of transformations (dilations, translations, rotations, and reflections) on two dimensional figures. [8-G3]

Standard 8.24 - Determining Similarity of Figures

Given a pair of two-dimensional figures, determine if a series of dilations and rigid motions maps one figure onto the other, recognizing that if such a sequence exists the figures are similar; describe the transformation sequence that exhibits the similarity between them. [8-G4]

Standard 8.25 - Angles formed by Parallel Lines cut by a Transversal

Analyze and apply properties of parallel lines cut by a transversal to determine missing angle measures.

Standard 8.25a - Angles of Triangles

a. Use informal arguments to establish that the sum of the interior angles of a triangle is 180 degrees. [8-G5]

Unit 6 - Statistics: Two-Variable Data and Fitting a Linear Model

Standard 8.18 - Scatter Plots

Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities, describing patterns in terms of positive, negative, or no association, linear and nonlinear association, clustering, and outliers. [8-SP1]

Standard 8.19 - Lines of Best Fit

Given a scatter plot that suggests a linear association, informally draw a line to fit the data, and assess the model fit by judging the closeness of the data points to the line. [8-SP2]

Standard 8.20 - Applying Lines of Best Fit

[8.SP.3.] Use a linear model of a real-world situation to solve problems and make predictions. a. Describe the rate of change and y-intercept in the context of a problem using a linear model of a real-world

situation. Example: In a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.

Standard 8.21 - Two-Way Tables

[8.SP.4.] Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects, using relative frequencies calculated for rows or columns to describe possible associations between the two variables. Example: Collect data from students in your class on whether or not they have a curfew on school nights, and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?

Ongoing Process and Skill Standards (taught throughout the year)

Standards for Mathematical Practice

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Reporting Categories	Possible Points
Grade 8	
Numbers, Algebra, and Functions <i>Standards: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17</i>	29
Data Analysis, Statistics, and Probability <i>Standards: 18, 19, 20, 21</i>	6
Geometry and Measurement <i>Standards: 22, 23, 24, 25, 26, 27, 28, 29, 30</i>	11
Total Math Points Possible for Grade 8	46