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Alabama Alternate Achievement Standards

Mathematics

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This document was developed by the 2017 Alabama Alternate Achievement Standards Mathematics Committee. The committee was composed of both general education teachers, special education teachers, English Language Acquisition Teachers, Teachers of the Visually Impaired and Teachers of the Deaf.

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OVERVIEW

Introduction

The Mathematics Alternate Achievement Standards are directly aligned to the Alabama Mathematics Standards. The Mathematics Alternate Achievement Standards in this document were developed by general and special education teachers in Alabama to guide and direct instruction for students with the most significant intellectual disabilities.

Students with Significant Intellectual Disabilities

In the United States, approximately 1% of school-aged children have an intellectual disability that is "characterized by significant limitations both in intellectual functioning and adaptive behavior as expressed in conceptual, social, and practical adaptive skills." (U.S. Department of Education, 2002 and American Association of Intellectual and Developmental Disabilities, 2009) These students show evidence of cognitive functioning in the range of severe to profound and need extensive or pervasive support. In addition to significant intellectual disabilities, students may also have accompanying communication, motor, sensory, or other impairments.

Students with the most significant intellectual disabilities first gained mandated access to the general curriculum through the *Individuals with Disabilities Education Act Amendments of 1997* (PL 105-17), with further access guaranteed following the passage of the *No Child Left Behind Act* (NCLB) of 2001 (PL 107-110). Today, the *Every Student Succeeds Act* (ESSA) says a state may, through a documented and validated standards-setting process, adopt alternate academic achievement standards for students with the most significant cognitive disabilities, provided those standards—

- are aligned with the challenging State academic content standards;
- promote access to the general education curriculum, consistent with the *Individuals with Disabilities Education Act* (IDEA);
- reflect professional judgment as to the highest possible standards achievable by such students; are designated in the IEP developed under section 614(d)(3) of IDEA for each such student as the academic achievement standards that will be used for the student;
- and are aligned to ensure that a student who meets the alternate academic achievement standards is on track to pursue postsecondary education or employment, consistent with the purposes of the *Workforce Innovation and Opportunity Act* to maximize opportunities for individuals with significant disabilities for competitive integrated employment. (ESSA, Section 1111 (b)(1)(E))

Format of the Alternate Achievement Standards

The format of the Alabama Alternate Achievement Standards includes the grade, general education standard, alternate achievement standard, and the topic area.

ALABAMA ALTERNATE ACHIEVEMENT STANDARDS KINDERGARTEN Mathematics	
General Education Standards	**Alabama Alternate Achievement Standards**
COUNTING AND CARDINALITY	
Know number names and the count sequence.	
M.K.1- Count to 100 by ones and by tens.	M.AAS.K.1- Count to tens by ones.

Augmentative/Alternative Devices

The Alabama Alternate Achievement Standards are to be taught using the student's communication modality (e.g., voice, sign language, augmentative/alternative communication device). This does not mean an augmentative/alternative device should be programmed to do the cognition for the student.

Accommodations

Please be familiar with accommodations. Accommodations are available for students with disabilities to level the playing field and lessen the impact of their disability in the teaching/learning and testing environments. It is important that the accommodations in the student's IEP are being appropriately determined, documented, and implemented. An example of an appropriate accommodation for a student with a visual impairment who is working toward the Alabama Alternate Achievement Standards would be using a tactile representation in place of an illustration or picture. The augmentative/alternative communication devices discussed above are an appropriate accommodation for students with communication difficulties when a verbal response is desired or needed.

ALABAMA ALTERNATE ACHIEVEMENT STANDARDS KINDERGARTEN Mathematics	
General Education Standards	**Alabama Alternate Achievement Standards**
COUNTING AND CARDINALITY	
Know number names and the count sequence.	
M.K.1- Count to 100 by ones and by tens.	M.AAS.K.1 - Count to twenty by ones.
M.K.3- Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).	M.AAS.K.3- Distinguish numerals from other print (letters, symbols); recognize numerals 0 through 5 as written.
Count to tell the number of objects.	
M.K.4- Understand the relationship between numbers and quantities; connect counting to cardinality. a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object. b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted. c. Understand that each successive number name refers to a quantity that is one larger.	M.AAS.K.4- When counting objects, demonstrate one-to-one correspondence by saying the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object (limit numbers and objects to five).
M.K.5- Count to answer "how many" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.	M.AAS.K.5- Answer "how many" questions by counting objects arranged in a line and a rectangular array (limit objects to five).
Compare numbers.	
M.K.6- Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies. (Include groups with up to ten objects.) M.K.7- Compare two numbers between 1 and 10 presented as written numerals.	M.AAS.K.6- Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group (limit objects per group to five). M.AAS.K.7- Compare two numbers between 1 and 5 presented as written numerals.
OPERATIONS AND ALGEBRAIC THINKING	

Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.	
M.K.8- Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. (Drawings need not show details, but should show the mathematics in the problem. This applies wherever drawings are mentioned in the Standards.)	M.AAS. K.8- Represent addition as "add to/put together" and subtraction as "take from/take apart" with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, or verbal explanations (limited to five).
M.K.9- Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.	M.AAS.K.9 -Solve addition and subtraction word problems, and add and subtract within 5, e.g., by using objects or drawings to represent the problem.
M.K.10- Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).	M.AAS.K.10- Demonstrate, using a model with objects, composing and decomposing numbers (limited to ten and less).
M.K.12- Fluently add and subtract within 5.	M.AAS.K.12- Represent addition and subtraction of 1 more or 1 less from a number 1 to 5.
MEASUREMENT AND DATA	
Describe and compare measurable attributes.	
M.K.14- Describe measurable attributes of objects such as length or weight. Describe several measurable attributes of a single object.	M.AAS.K.14- Describe common objects by attribute such as size (*big/small*), weight (*heavy/light*) and length (*long/short*).
M.K.15- Directly compare two objects, with a measurable attribute in common, to see which object has "more of" or "less of" the attribute, and describe the difference.	M.AAS.K.15- Compare two objects with regard to size (*bigger/smaller*) and weight (*heavier/lighter*) and height (*taller/shorter*).
Classify objects and count the number of objects in each category.	
M.K.16- Classify objects into given categories; count the number of objects in each category, and sort the categories by count. (Limit category counts to be less than or equal to 10.)	M.AAS.K.16- Explore a simple pictograph (limited to two categories and limit a combined quantity of 5 for both categories).
GEOMETRY	
Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).	
M.K.17- Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above, below, beside, in front of, behind,* and *next to*.	M.AAS.K.17- Match shapes of the same size and orientation and describe the relative positions using *in front of* and *behind* (limited to circle, square, rectangle, and triangle).
M.K.18- Correctly name shapes regardless of their orientations or overall size.	M.AAS.K.18- Recognize a circle, square, rectangle, and triangle.
M.K.19- Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").	M.AAS.K.19- Match a real-life two-dimensional or three-dimensional object with a drawing of the object.
Analyze, compare, create, and compose shapes.	

M.K.21- Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.	M.AAS.K.21- Match a shape to common objects (real or picture; limited to circle, square, rectangle, and triangle).

ALABAMA ALTERNATE ACHIEVEMENT STANDARDS GRADE 1 Mathematics	
General Education Standards	**Alabama Alternate Achievement Standards**
OPERATIONS AND ALGEBRAIC THINKING	
Represent and solve problems involving addition and subtraction.	
M.1.1- Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	M.AAS.1.1- Represent addition as "add to/put together" and subtraction as "take from/take apart" with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, or verbal explanations (limited to 15).
M.1.2- Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	M.AAS.1.2- Solve problems with two given sets using "putting together" with objects and drawings (each set limited to ten).
Add and subtract within 20.	
M.1.5- Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).	M.AAS.1.5- Represent addition and subtraction of 1 more or 1 less from a number 1 to 15.
M.1.6- Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 - 4 = 13 - 3 - 1 = 10 - 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 - 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13.	M.AAS.1.6- Add and subtract numbers 1 to 15 using objects, pictures, and fingers.
NUMBERS AND OPERATIONS IN BASE TEN	
Extend the counting sequence.	
M.1.9- Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.	M.AAS.1.9- Count to 30 by ones. Distinguish numerals from other print (letters, symbols); recognize numerals 0 through 15 as written. When given a numeral 0 to 15, represent the numeral with objects.

Understand place value.	
M.1.10- Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: a. 10 can be thought of as a bundle of ten ones, called a "ten." b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).	M.AAS.1.10- Recognize and create sets of ten (limit to three sets).
M.1.11- Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.	M.AAS.1.11- Compare two sets of items using greater than, less than or same (sets limited to 1 to 19 items; each set differs by less than 4). M.AAS.1.11a - Identify whether the number of objects in one group is greater than, less than, or same/equal to the number of objects in another group, e.g., by using matching and counting strategies. (Include groups with up to 15 objects.) M.AAS.1.11b -Compare two numbers between 1 and 15 presented as written numerals.
Use place value understanding and properties of operations to add and subtract.	
M.1.12- Add within 100, including adding a two-digit number and a one-digit number and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method, and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.	M.AAS.1.12- Compose and decompose numbers from 1 to 15 into one ten and ones using objects, drawings, or pictures.
MEASUREMENT AND DATA	
Measure lengths indirectly and by iterating length units.	
M.1.15- Order three objects by length; compare the lengths of two objects indirectly by using a third object.	M.AAS.1.15- Compare lengths of objects (real or pictures) in terms of *longer/shorter* and *taller/shorter*.
Tell and write time.	
M.1.17- Tell and write time in hours and half-hours using analog and digital clocks.	M.AAS.1.17- Demonstrate an understanding of the concept of time using words such as yesterday, today, tomorrow, morning, afternoon, day, and night; identify activities that come before, next, and after on a daily schedule using a clock limited to time in hours.
Represent and interpret data.	

M.1.18- Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.	M.AAS.1.18- Sort objects or pictures into common categories (e.g., shapes, pets, fruits; limited to two categories and a combined total of 15 objects/pictures for the categories).
GEOMETRY	
Reason with shapes and their attributes.	
M.1.19- Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.	M.AAS.1.19- Determine similarities and differences among shapes (limited to circle, square, rectangle, and triangle).
M.1.20- Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. (Students do not need to learn formal names such as “right rectangular prism.”)	M.AAS.1.20- Sort shapes of the same size and orientation (limited to circle, square, rectangle, and triangle).
M.1.21- Partition circles and rectangles into two and four equal shares; describe the shares using the words *halves, fourths,* and *quarters*; and use the phrases *half of, fourth of,* and *quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.	M.AAS.1.21- Put together two equal size pieces to make a shape that relates to a whole (limited to circle, square, rectangle, and triangle).

ALABAMA ALTERNATE ACHIEVEMENT STANDARDS GRADE 2 Mathematics	
General Education Standards	**Alabama Alternate Achievement Standards**
OPERATIONS AND ALGEBRAIC THINKING	
Represent and solve problems involving addition and subtraction.	
M.2.1- Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	M.AAS.2.1- Represent addition and subtraction by using objects, pictures, fingers, or sounds (within 30).
Work with equal groups of objects to gain foundations for multiplication.	
M.2.3- Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.	M.AAS.2.3- Separate even numbers of objects into two groups (limited to twenty total objects).
M.2.4- Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.	M.AAS.2.4- Find the total number of objects in two equal groups (limit of twenty total objects).
NUMBERS AND OPERATIONS IN BASE TEN	
Understand place value.	
M.2.5- Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases: a. 100 can be thought of as a bundle of ten tens, called a “hundred.” b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).	M.AAS.2.5- Recognize and represent numbers up to 30 with sets of tens and ones (objects, columns, arrays).
M.2.6- Count within 1000; skip-count by 5s, 10s, and 100s.	M.AAS.2.6- Count to 50 by ones. When given a numeral 0 to 25, name the next number in a three-item sequence.
M.2.7- Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.	M.AAS.2.7- Recognize numerals 0 through 30 as written. When given a numeral 0 to 30, represent the numeral with objects. Match a numeral 1 to 30 to a quantity.
M.2.8- Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits using >, =, and < symbols to record the results of comparisons.	M.AAS.2.8- Compare sets of objects and numbers using appropriate vocabulary (greater than, less than, equal to; limited to thirty objects in a group).

Use place value understanding and properties of operations to add and subtract.	
M.2.9- Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	M.AAS.2.9- Identify the meaning of the + sign (add, plus, put together) and the – sign (subtract, take away, take from) and the = sign (equal, the same as); compose and decompose numbers up to 30 using objects, pictures, drawings, or numbers.
M.2.10- Add up to four two-digit numbers using strategies based on place value and properties of operations.	M.AAS.2.10- Add and subtract numbers 0 to 30 using objects, pictures, and numbers.
MEASUREMENT AND DATA	
Measure and estimate lengths in standard units.	
M.2.14- Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.	M.AAS.2.14- Identify standard tools associated with measurement (clock, ruler, scale, measuring cup); measure the lengths of objects using nonstandard units (e.g., hands, paper clips).
M.2.16- Estimate lengths using units of inches, feet, centimeters, and meters.	M.AAS.2.16- Order three objects by length (long/longer/longest; short/shorter/shortest).
Relate addition and subtraction to length.	
M.2.18- Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.	M.AAS.2.18- Increase or decrease length by adding or subtracting nonstandard unit(s).
M.2.19- Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2 . . ., and represent whole-number sums and differences within 100 on a number line diagram.	M.AAS.2.19- Represent whole-number sums within 20 using a number line.
Work with time and money.	
M.2.20- Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.	M.AAS.2.20- Identify the time that matches a routine activity using a clock (limited to hour).
M.2.21- Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately.	M.AAS.2.21- Demonstrate knowledge that money has value; identify coins (penny, nickel, dime).
Represent and Interpret data	
M.2.23- Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.	M.AAS.2.23- Use a pictograph, limited to 2 categories, to answer more/less, most/least, or equal to questions (limited to two categories and a combined total of no more than 30 objects/pictures shown for the 2 categories).

GEOMETRY	
Reason with shapes and their attributes.	
M.2.24- Recognize and draw shapes having specified attributes such as a given number of angles or a given number of equal faces. (Sizes are compared directly or visually, not compared by measuring.) Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.	M.AAS.2.24- Identify two-dimensional shapes (limited to square, circle, triangle, and rectangle).
M.2.26- Partition circles and rectangles into two, three, or four equal shares; describe the shares using the words *halves, thirds, half of, a third of*, etc.; and describe the whole as two halves, three thirds, or four fourths. Recognize that equal shares of identical wholes need not have the same shape.	M.AAS.2.26- Identify half as being two equal parts of a shape (limited to circle, square, rectangle, and triangle).

ALABAMA ALTERNATE ACHIEVEMENT STANDARDS GRADE 3 Mathematics	
General Education Standards	**Alabama Alternate Achievement Standards**
OPERATIONS AND ALGEBRAIC THINKING	
Represent and solve problems involving multiplication and division.	
M.3.1- Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each.	M.AAS.3.1- Find the sum of equal groups of objects using repeated addition (sums up to 30).
M.3.2- Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.	M.AAS.3.2- Divide a group of items into smaller equal groups (limit given group to fifteen items or less; limit equal groups to two, three, four, five, ten).
Multiply and divide within 100.	
M.3.7- Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	M.AAS.3.7- Multiply and divide one-digit numbers using repeated addition or repeated subtraction where the products are within twenty and the factors are one, two, three, four, five, or ten using multiplication and division tools.
Solve problems involving the four operations, and identify and explain patterns in arithmetic.	
M.3.8- Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify an order (Order of Operations).)	M.AAS.3.8- Solve one-step real-world problems using addition or subtraction without regrouping.
M.3.9- Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.	M.AAS.3.9- Extend numeric and non-numeric patterns of two terms.
NUMBER AND OPERATIONS IN BASE TEN	
Use place value understanding and properties of operations to perform multi-digit arithmetic. (A range of algorithms may be used.)	
M.3.10- Use place value understanding to round whole numbers to the nearest 10 or 100.	M.AAS.3.10- Use decade numbers (0, 10, 20, 30) as benchmarks to demonstrate understanding of place value for rounding numbers 0 to 34 using rounding tools (charts, number lines).
M.3.11- Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition	M.AAS.3.11- Add and subtract one- and two-digit numbers up to 30 (no regrouping).

and subtraction.	
M.3.12- Multiply one-digit whole numbers by multiples of 10 in the range 10 - 90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.	M.AAS.3.12- Relate groups of ten to multiplying by ten up to 100, using objects, skip counting by tens.
NUMBERS AND OPERATIONS – FRACTIONS	
Develop understanding of fractions as numbers.	
M.3.13- Understand a fraction 1/*b* as the quantity formed by 1 part when a whole is partitioned into *b* equal parts; understand a fraction *a/b* as the quantity formed by *a* parts and size 1/*b*.	M.AAS.3.13- Use models to represent unit fractions as parts of a whole (halves and fourths).
M.3.14- Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. Represent a fraction 1/*b* on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size 1/*b* and that the endpoint of the part based at 0 locates the number 1/*b* on the number line. b. Represent a fraction *a/b* on a number line diagram by marking off *a* lengths 1/*b* from 0. Recognize that the resulting interval has size *a/b* and that its endpoint locates the number *a/b* on the number line.	M.AAS.3.14- Use a number line to represent halves and fourths.
M.3.15- Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. a. Understand two fractions as equivalent (equal) if they are the same size or the same point on a number line. b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model. c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	M.AAS.3.15- Compare fractions. M.AAS.3.15a- Use models to identify two equivalent fractions (limit to fourths and halves). M.AAS.3.15b- Recognize two equivalent fractions (limit to fourths and halves). M.AAS.3.15c- Use models of fourths and halves to make a whole.
MEASUREMENT AND DATA	
Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of	

objects.	
M.3.16- Tell and write time to the nearest minute, and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.	M.AAS.3.16- Tell time to the nearest half hour on a clock.
M.3.17- Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). (Excludes compound units such as cm^3 and finding the geometric volume of a container.) Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (Excludes multiplicative comparison problems (problems involving notions of "times as much").)	M.AAS.3.17- Identify the appropriate measurement tool to measure liquid; identify the appropriate standard unit of measurement (grams, kilograms, and liters).
Represent and interpret data.	
M.3.18- Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.	M.AAS.3.18- Use a pictograph or bar graph to answer questions about data (limit to three categories).
M.3.19- Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot where the horizontal scale is marked off in appropriate units – whole numbers, halves, or quarters.	M.AAS.3.19- Measure lengths of objects using standard tools (rulers, yardsticks, meter sticks). Limit to whole numbers.
Geometric measurement: understand concepts of area and relate area to multiplication and to addition.	
M.3.20- Recognize area as an attribute of plane figures, and understand concepts of area measurement. a. A square with side length 1 unit called "a unit square," is said to have "one square unit" of area and can be used to measure area. b. A plane figure which can be covered without gaps or overlaps by *n* unit squares is said to have an area of *n* square units.	M.AAS.3.20- Identify a model that demonstrates area and/or recognize one square unit of area as a "unit square" to use when measuring area.
M.3.22- Relate area to the operations of multiplication and addition. a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area	M.AAS.3.22- Find the area of a rectangle with side lengths of no more than one, two, three, four, or five.

models to represent the distributive property in mathematical reasoning. d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into nonoverlapping rectangles and adding the areas of the nonoverlapping parts, applying this technique to solve real-world problems.	
Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.	
M.3.23- Solve real-world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.	M.AAS.3.23- Find the perimeter of a rectangle with lengths limited to one to ten units.
GEOMETRY	
Reason with shapes and their attributes.	
M.3.24- Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.	M.AAS.3.24- Identify two-dimensional shapes by their attributes (triangle, rectangle, square, circle).

ALABAMA ALTERNATE ACHIEVEMENT STANDARDS GRADE 4 Mathematics	
General Education Standards	**Alabama Alternate Achievement Standards**
OPERATIONS AND ALGEBRAIC THINKING	
Use the four operations with whole numbers to solve problems.	
M.4.3- Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	M.AAS.4.3- Solve one-step real-world problems using addition, multiplication, or subtraction (within forty; no regrouping); select the appropriate method of computation (limited to addition or subtraction) when problem solving.
Gain familiarity with factors and multiples.	
M.4.4- Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a whole number in the range 1-100 is prime or composite.	M.AAS.4.4- Arrange, match, and/or recognize factor pairs limited to ones, twos, threes, fours, fives, and tens to their products using models or tools.
NUMBER AND OPERATIONS IN BASE TEN	
Generalize place value understanding for multi-digit whole numbers.	
M.4.6- Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.	M.AAS.4.6- Compose and decompose numbers from 11 to 50 into a number of tens and a number of ones.
M.4.7- Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	M.AAS.4.7- Compare the value of two numbers up to 100 and read a whole number up to 100.
M.4.8- Use place value understanding to round multi-digit whole numbers to any place.	M.AAS.4.8- Round a whole number from 1 to 99 to the nearest ten.
Use place value understanding and properties of operations to perform multi-digit arithmetic.	
M.4.9- Fluently add and subtract multi-digit whole numbers using the standard algorithm.	M.AAS.4.9- Add and subtract one- and two-digit numbers with regrouping.
M.4.10- Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	M.AAS.4.10- Multiply a two-digit number by a one-digit number with no regrouping.
M.4.11- Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using	M.AAS.4.11- Divide a two-digit number by a one-digit number with no remainder.

strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	
NUMBERS AND OPERATIONS – FRACTIONS	
Extend understanding of fraction equivalence and ordering.	
M.4.13- Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols for >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	M.AAS.4.13- Using models, identify a fraction that is greater than, less than, or equal to a given fraction (limited to halves, thirds, and fourths).
Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	
M.4.15- Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. a. Understand a fraction *a/b* as a multiple of 1/*b*. b. Understand a multiple of *a/b* as a multiple of 1/*b*, and use this understanding to multiply a fraction by a whole number. c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.	M.AAS.4.15- Multiply a one-digit whole number by a unit fraction (limited to whole numbers to 1 to 5 and fractions of halves, fourths, and thirds).
Understand decimal notation for fractions, and compare decimal fractions.	
M.4.17- Use decimal notation for fractions with denominators 10 or 100.	M.AAS.4.17- Use decimal notation for a fraction with a denominator of 10.
MEASUREMENT AND DATA	
Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	
M.4.19- Know relative sizes of measurement units within one system of units, including km, m, cm; kg, g; lb, oz; l, ml; and hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.	M.AAS.4.19- Identify the smaller measurement unit that comprises a larger unit within a measurement system (inches/feet, minutes/hours, feet/yards).
M.4.20- Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	M.AAS.4.20- Tell time to the half-hour; identify the hour before or after a given time; measure weight using standard units; recognize the value of coins in cents.

M.4.21- Apply the area and perimeter formulas for rectangles in real-world and mathematical problems.	M.AAS.4.21- Given a drawing of a square or rectangle on a grid, determine the area or perimeter (sum or product limited to 40).
Represent and interpret data.	
M.4.22- Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots.	M.AAS.4.22- Interpret data on a pictograph or bar graph to solve a problem.
Geometric measurement: understand concepts of angle and measure angles.	
M.4.23- Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement. a. An angle is measured with reference to a circle with its center at the common endpoint of the rays by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle" and can be used to measure angles. b. An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.	M.AAS.4.23- Identify an angle in a given shape (square, rectangle, triangle).
GEOMETRY	
Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	
M.4.26- Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	M.AAS.4.26- Recognize angles, parallel and perpendicular lines, and intersecting lines.
M.4.28- Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.	M.AAS.4.28- Given a drawing of a shape with a line drawn across the shape, identify if it is divided symmetrically.

ALABAMA ALTERNATE ACHIEVEMENT STANDARDS GRADE 5 Mathematics	
General Education Standards	**Alabama Alternate Achievement Standards**
OPERATIONS AND ALGEBRAIC THINKING	
Write and Interpret numerical expressions.	
M.5.2- Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.	M.AAS.5.2- Select the expression that represents a given calculation (include parentheses).
Analyze patterns and relationships.	
M.5.3- Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.	M.AAS.5.3- Extend an addition or subtraction number pattern given one rule and the starting point of less than 10.
NUMBER AND OPERATIONS IN BASE TEN	
Understand the place value system.	
M.5.6- Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 x 100 + 4 x 10 + 7 x 1 + 3 x ($^1/_{10}$) + 9 x ($^1/_{100}$) + 2 x ($^1/_{1000}$). b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	M.AAS.5.6- Compare numbers, including decimals up to hundredths.
M.5.7- Use place value understanding to round decimals to any place.	M.AAS.5.7- Round three-digit whole numbers from 100 to 949 to the nearest 10 or 100 and round decimals to the nearest hundredths using dollars and cents.
Perform operations with multi-digit whole numbers and with decimals to hundredths.	
M.5.8- Fluently multiply multi-digit whole numbers using the standard algorithm.	M.AAS.5.8- Multiply a two-digit number by a one-digit number with regrouping.
M.5.9- Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	M.AAS.5.9- Divide a three-digit number by a one-digit number with no remainder.
M.5.10- Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method, and explain the reasoning used.	M.AAS.5.10- Add and subtract two-digit numbers with regrouping (include numbers with decimals of tenths).
NUMBER AND OPERATIONS – FRACTIONS	

Use equivalent fractions as a strategy to add and subtract fractions.	
M.5.11- Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.	M.AAS.5.11- Use a model to add and subtract fractional parts with like denominators.
M.5.12- Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally, and assess the reasonableness of answers.	M.AAS.5.12- Solve word problems involving addition and subtraction of fractions with like denominators.
Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	
M.5.14- Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product $(^{a}/_{b})$ x q as a part of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a x $q \div b$. b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.	M.AAS.5.14- Find the product of unit fractions (with denominators of 2, 3, 4, 5, 10).
M.5.16- Solve real-world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem. M.5.17- Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. (Students able to multiply fractions in general can develop strategies to divide fractions in general by reasoning about the relationship between multiplication and division. However, division of a fraction by a fraction is not a requirement at this grade.) a. Interpret division of a unit fraction by a nonzero whole number, and compute such quotients. b. Interpret division of a whole number by a unit fraction, and compute such quotients. c. Solve real-world problems involving division of unit fractions by nonzero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem.	M.AAS.5.16- Use a model to solve one-step real-world problems involving multiplying a whole number by a unit fraction. M.AAS.5.17- Divide a whole number by a unit fraction.
MEASUREMENT AND DATA	
Convert like measurement units within a given measurement system.	

M.5.18- Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multistep, real-world problems.	M.AAS.5.18a- Given a smaller unit of measurement, determine how many smaller units it would take to make the larger unit.
Represent and interpret data.	
M.5.19- Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots.	M.AAS.5.19- Interpret data on a bar graph, pictograph, or line plot to display a data set of measurements in fractions of a unit (limited to halves).
Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	
M.5.21- Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft., and improvised units.	M.AAS.5.21- Determine the volume of a three-dimensional figure by counting unit cubes (where at least the width or height or depth is 1).
GEOMETRY	
Graph points on the coordinate plane to solve real world and mathematical problems.	
M.5.23- Use a pair of perpendicular number lines, called axes, to define a coordinate system with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).	M.AAS.5.23- Identify quadrant 1 and the origin on a coordinate system grid.
M.5.24- Represent real-world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.	M.AAS.5.24- Identify the coordinate values of a point with whole number coordinates in quadrant 1 (*x* and *y* values limited to 5 or less).
Classify two-dimensional figures into categories based on their properties.	
M.5.25- Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.	M.AAS.5.25- Classify two-dimensional figures and identify the attributes (angles, number of sides, corners) they have in common.

ALABAMA ALTERNATE ACHIEVEMENT STANDARDS GRADE 6 Mathematics	
General Education Standards	**Alabama Alternate Achievement Standards**
RATIOS AND PROPORTIONAL RELATIONSHIPS	
Understand ratio concepts and use ratio reasoning to solve problems.	
M.6.1- Understand the concept of a ratio, and use ratio language to describe a ratio relationship between two quantities.	M.AAS.6.1- Select a ratio to match a given statement and representation
M.6.2- Understand the concept of a unit rate $^{a}/_{b}$ associated with a ratio *a:b* with $b \neq 0$, and use rate language in the context of a ratio relationship.	M.AAS.6.2- Recognize rate vocabulary in a real-world situation (e.g., miles per hour, dollars per pound).
M.6.3- Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. b. Solve unit rate problems including those involving unit pricing and constant speed. c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means $^{30}/_{100}$ times the quantity); solve problems involving finding the whole, given a part and the percent. d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	M.AAS.6.3- Solve simple real-world problems using ratio/rate reasoning. M.AAS.6.3a- Answer simple questions about a table of equivalent ratios with whole-number measurements. M.AAS.6.3b- Calculate unit-rate problems, including those involving unit pricing. M.AAS.6.3c- Identify a percentage equivalent to a fraction (e.g., 1/2, 1/4, 1). M.AAS.6.3d- Identify the decimal equivalent of a percentage (limited to 10%, 20%, 25%, 40%, and 50%).
THE NUMBER SYSTEM	
Apply and extend previous understandings of multiplication and division to divide by fractions.	
M.6.4- Interpret and compute quotients of fractions, and solve word problems involving division of fractions, e.g., by using visual fraction models and equations to represent the problem.	M.AAS.6.4- Divide fractions using visual fraction models.
Compute fluently with multi-digit numbers and find common factors and multiples.	
M.6.5- Fluently divide multi-digit numbers using the standard algorithm.	M.AAS.6.5- Divide a multi-digit whole number by a single-digit with a remainder. Divide a multi-digit whole number by a two-digit number with no remainders.
M.6.6- Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each	M.AAS.6.6- Calculate addition, subtraction, and multiplication problems solving two-digit addition,

operation.	subtraction, and multiplication problems with decimals up to hundredths (e.g., money problems).
Apply and extend previous understandings of numbers to the system of rational numbers.	
M.6.8- Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts explaining the meaning of 0 in each situation.	M.AAS.6.8- Identify positive and negative numbers in real-world situations (e.g., using visual representations related to credits/debits, temperatures above/below zero).
M.6.9- Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.	
a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., -(-3) = 3, and that 0 is its own opposite.	M.AAS.6.9a- Identify positive and negative numbers on a number line.
b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.	M.AAS.6.9b- Locate or plot positive and negative numbers on a number line.
c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.	M.AAS.6.9c - Find given points between -10 and 10 on both axes of a coordinate plane.
M.6.11- Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	M.AAS.6.11 - Graph or identify points in all four quadrants of the coordinate plane, given a coordinate plane on graph paper between -10 and 10.
EXPRESSIONS AND EQUATIONS	
Apply and extend previous understandings of arithmetic to algebraic expressions.	
M.6.13- Write, read, and evaluate expressions in which letters stand for numbers.	M.AAS.6.13- Describe a given mathematical or real-world problem with an expression including one unknown.
a. Write expressions that record operations with numbers and with letters standing for numbers.	M.AAS.6.13a- Evaluate expressions at specific values of their variables (e.g., $m + x = ?$, where $x = 3$ and $m = 2$).
b. Identify parts of an expression using mathematical terms (*sum, term, product, factor, quotient, coefficient*); view one or more parts of an expression as a single entity.	M.AAS.6.13b- Identify parts of an expression using mathematical terms (e.g., *sum*, *product*, *difference*, *quotient*).
c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform	

arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).	
Reason about and solve one-variable equations and inequalities.	
M.6.17- Use variables to represent numbers, and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number or, depending on the purpose at hand, any number in a specified set.	M.AAS.6.17- Match a phrase to the corresponding one-step one-variable expression (e.g., "a number plus 3" matches "x + 3").
M.6.18- Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q, and x are all nonnegative rational numbers.	M.AAS.6.18 - Solve real-world, single-step linear equations involving positive rational numbers.
GEOMETRY	
Solve real-world and mathematical problems involving area, surface area, and volume.	
M.6.21- Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.	M.AAS.6.21- Calculate problems about perimeter of squares, triangles, rectangles, and other polygons with sides up to ten units; calculate problems involving finding the area of rectangles and squares with sides up to 10 units.
M.6.22- Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = Bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	M.AAS.6.22- Solve simple problems about volume using unit cubes.
M.6.24- Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.	M.AAS.6.24- Identify a three-dimensional shape (cube, cone, cylinder) and match it to its nets.
STATISTICS AND PROBABILITY	
Develop understanding of statistical variability.	
M.6.25- Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.	M.AAS.6.25- Interpret a simple graph representing statistical data.

Summarize and describe distributions.	
M.6.28- Display numerical data in plots on a number line, including dot plots, histograms, and box plots.	M.AAS.6.28- Interpret numerical data on a dot plot or histogram.
M.6.29- Summarize numerical data sets in relation to their context, such as by: a. Reporting the number of observations. b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation) as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	M.AAS.6.29- Using a data display, describe the data trend (increasing/going up, decreasing/going down).

ALABAMA ALTERNATE ACHIEVEMENT STANDARDS GRADE 7 Mathematics	
General Education Standards	**Alabama Alternate Achievement Standards**
RATIOS AND PROPORTIONAL RELATIONSHIPS	
Analyze proportional relationships and use them to solve real-world and mathematical problems.	
M.7.1- Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units.	M.AAS.7.1- Calculate a unit rate (numbers limited to whole numbers under 100).
M.7.2- Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. c. Represent proportional relationships by equations. d. Explain what a point (*x, y*) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, *r*) where r is the unit rate.	M.AAS.7.2- Use a ratio to model or describe a real-world relationship (ratio or rate).
M.7.3- Use proportional relationships to solve multistep ratio and percent problems.	M.AAS.7.3- Calculate 10%, 20%, 25%, 50% of a number up to 100, to identify a proportional relationship.
THE NUMBER SYSTEM	
Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	
M.7.4- Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. a. Describe situations in which opposite quantities combine to make 0. b. Understand $p + q$ as the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. c. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their	M.AAS.7.4- Given a number line divided by increments of 1/4, visual representations, or manipulatives, add and subtract fractions with like and unlike denominators of 2 and 4.

difference, and apply this principle in real-world contexts. d. Apply properties of operations as strategies to add and subtract rational numbers.	
M.7.5- Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (-1)(-1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with nonzero divisor) is a rational number. If *p* and *q* are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts. c. Apply properties of operations as strategies to multiply and divide rational numbers. d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	M.AAS.7.5a- Multiply proper fractions to include 1/2, 1/4, 1/8, and 1/10. M.AAS.7.5b- Simplify proper fractions. M.AAS.7.5c- Solve division problems with divisors up to five and also with a divisor of 10 without remainders.
M.7.6- Solve real-world and mathematical problems involving the four operations with rational numbers. (Computations with rational numbers extend the rules for manipulating fractions to complex fractions.)	M.AAS.7.6- Solve real-world and mathematical problems involving addition, subtraction, and multiplication with rational numbers (fractions to include 1/2, 1/4, 1/8, and 1/10).
EXPRESSIONS AND EQUATIONS	
Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	
M.7.9- Solve multistep real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form, convert between forms as appropriate, and assess the reasonableness of answers using mental computation and estimation strategies.	M.AAS.7.9- Solve addition and subtraction of positive and negative numbers in real-world situations (e.g., credits and debits, temperatures, elevations).

M.7.10- Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality, and interpret it in the context of the problem.	M.AAS.7.10- Solve one-step addition, subtraction, or multiplication problems with one variable.
GEOMETRY	
Draw, construct, and describe geometrical figures and describe the relationships between them.	
M.7.11- Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	M.AAS.7.11- Given a geometric figure, recognize a similar scaled figure with the same orientation.
M.7.13- Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	M.AAS.7.13- Match a two-dimensional shape with a three-dimensional shape that shares an attribute (rectangle with a rectangular prism, square with a cube, circle with a sphere).
Solve real-world and mathematical problems involving angle measure, area, surface area, and volume.	
M.7.14- Know the formulas for the area and circumference of a circle, and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	M.AAS.7.14- Identify the radius, diameter, and circumference of a circle.
M.7.15- Use facts about supplementary, complementary, vertical, and adjacent angles in a multistep problem to write and solve simple equations for an unknown angle in a figure.	M.AAS.7.15- Categorize angles as acute, obtuse, or right (freestanding or within a triangle).
M.7.16- Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	M.AAS.7.16- Solve real-world and mathematical problems involving volumes of cubes or rectangular prisms.
STATISTICS AND PROBABILITY	
Use random sampling to draw inferences about a population.	
M.7.17- Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	M.AAS.7.17- Given a statistical display (line graph, dot plot, histogram), in everyday language, identify what the display measures.
Draw informal comparative inferences about two populations.	

M.7.19- Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.	M.AAS.7.19- Compare two sets of data within a single data display such as a pictograph or bar graph.
Investigate chance processes and develop, use, and evaluate probability models.	
M.7.21- Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around $^1/_2$ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	M.AAS.7.21- Describe the probability of events occurring as possible or impossible.
M.7.22- Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.	M.AAS.7.22- Given a data set that represents a series of events, identify most likely event.
M.7.23- Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.	M.AAS.7.23- Model an event with two outcomes by flipping a coin.

ALABAMA ALTERNATE ACHIEVEMENT STANDARDS GRADE 8 Mathematics	
General Education Standards	**Alabama Alternate Achievement Standards**
THE NUMBER SYSTEM	
Know that there are numbers that are not rational, and approximate them by rational numbers.	
M.8.1- Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	M.AAS.8.1- Identify the decimal equivalents of common fractions as repeating or non-repeating (i.e., halves, thirds, fourths, fifths).
M.8.2- Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2).	M.AAS.8.2- Given the decimal approximation of irrational numbers located on a number line; compare the sizes of the irrational numbers.
EXPRESSIONS AND EQUATIONS	
Work with radicals and integer exponents.	
M.8.3- Know and apply the properties of integer exponents to generate equivalent numerical expressions.	M.AAS.8.3- Calculate the square of numbers 1 to 10.
M.8.4- Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.	M.AAS.8.4- Find the square root of the perfect squares up to 100.
Understand the connections among proportional relationships, lines, and linear equations.	
M.8.7- Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.	M.AAS.8.7- Determine slopes of 1/2, 1, and 2 from the graphs of proportional relationships.
M.8.8- Use similar triangles to explain why the slope *m* is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.	M.AAS.8.8- Identify the slope of a line using the rise and run from the associated triangle on the coordinate plane to determine the slopes of the line.
Analyze and solve linear equations and pairs of simultaneous linear equations.	
M.8.10- Analyze and solve pairs of simultaneous linear equations. a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersections of their graphs because points of intersection satisfy both equations simultaneously. b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by	M.AAS.8.10 - Identify the labeled point of intersection on graphs of two linear equations as a solution for both equations.

graphing the equations. Solve simple cases by inspection. c. Solve real-world and mathematical problems leading to two linear equations in two variables.	
FUNCTIONS	
Define, evaluate, and compare functions	
M.8.11- Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. (Function notation is not required in Grade 8.)	M.AAS.8.11- Identify a missing number in a function table that contains at least two complete ordered pairs by determining and applying the rule for the function (limited to linear functions; values limited to 10 or less).
M.8.13- Interpret the equation $y = mx + b$ as defining a linear function whose graph is a straight line; give examples of functions that are not linear.	M.AAS.8.13- Given a set of graphs, identify which graph is linear.
Use functions to model relationships between quantities.	
M.8.14- Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x,y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of linear function in terms of the situation it models and in terms of its graph or a table of values.	M.AAS.8.14- Given a graph of a function, determine if it is linear and identify the y-intercept. M.AAS.8.14a - Count out the rise over the run of a line on a graph to show the change from point to point on a line.
M.8.15- Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	M.AAS.8.15- Given the graph of a linear function, determine whether it is increasing or decreasing.
GEOMETRY	
Understand congruence and similarity using physical models, transparencies, or geometry software.	
M.8.16- Verify experimentally the properties of rotations, reflections, and translations: a. Lines are taken to lines, and line segments are taken to line segments of the same length. b. Angles are taken to angles of the same measure. c. Parallel lines are taken to parallel lines.	M.AAS.8.16- Recognize translations and reflections of a non-equilateral rectangle or triangle.
M.8.17- Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.	M.AAS.8.17- Given a geometric figure and a vertical or horizontal translation and reflection across a vertical or horizontal line, identify the components (lines/sides, angles) of the two figures that are congruent (limited to non-equilateral rectangles and triangles).
M.8.18- Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	M.AAS.8.18- Recognize the reflection (across the x- or y-axis) and translation (across quadrants) of a two-dimensional figure on a coordinate plane (limited to non-equilateral rectangles and triangles).

M.8.20- Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.	M.AAS.8.20- Compare any angle to a right angle using greater than, less than, or congruent to the right angle.
Understand and apply the Pythagorean Theorem.	
M.8.22- Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real world and mathematical problems in two and three dimensions.	M.AAS.8.22- Use a diagram of two similar right triangles with a simple multiple to find the measure of a missing side length.
STATISTICS AND PROBABILITY	
Investigate patterns of association in bivariate data.	
M.8.25- Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	M.AAS.8.25- Given a simple scatter plot of points in a straight line, identify a pattern.
M.8.28- Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.	M.AAS.8.28a- Recognize a display or table constructed from given categorized data; given a two-column table of data, recognize a display or table constructed from that data.

ALABAMA ALTERNATE ACHIEVEMENT STANDARDS Grade 9 Algebra IA	
General Education Standards	**Alabama Alternate Achievement Standards**
NUMBER AND QUANTITY	
The Real Number System	
Extend the properties of exponents to rational exponents.	
M.NS.HS.1- Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.	M.AAS.NS.HS.1- Recognize that a number raised to the ½ power is the square root of that number; similarly, a number raised to the 1/3 power is the cube root of that number. Identify the root of a number when given the fractional notation. Limit base values for square roots to 9, 16, 25. Limit base values for cube roots to 8, 27.
M.NS.HS.2- Rewrite expressions involving radicals and rational exponents using the properties of exponents.	M.AAS.NS.HS.2- Determine the value of an expression squared (base values 1-15) or cubed (base values 1-10).
Use properties of rational and irrational numbers.	
M.NS.HS.3- Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	M.AAS.NS.HS.3- Identify rational and irrational numbers within 1 to 20 (irrational numbers limited to pi, √2, √3, √5).
QUANTITIES	
Reason quantitatively and use units to solve problems.	
M.Q.HS.4- Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	M.AAS.Q.HS.4- Using real world models, express quantities of measurement to the given precision. (limited to measurements of length (inch, 1/2 inch, 1/4 inch), weight (pounds, kilograms (tenth of a unit), volume (cup, 1/2 cup, 1/4 cup, 1/3 cup, liter), temperature (degree), velocity (mph, kmph).
M.Q.HS.5- Define appropriate quantities for the purpose of descriptive modeling.	M.AAS.Q.HS.5- Recognize units of weight (ounces, pounds, grams, kilograms), length (inch, foot, mile, centimeter, meter, kilometer), area (square inches in^2, square feet ft^2, square centimeters cm^2, square meters m^2) and capacity (cubic inches in^3, cubic feet ft^3, cubic centimeters cm^3, cubic meters m^3).
M.Q.HS.6- Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	M.AAS.Q.HS.6- Estimate to the nearest 1, 10, and 100 when adding, subtracting, multiplying, or dividing; include units with estimates.
ALGEBRA	

Seeing structure in expressions	
Interpret the structure of expressions.	
M.A.HS.7- Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	M.AAS.A.HS.7- Identify an algebraic expression involving one arithmetic operation to represent a real-world problem.
Write expressions in equivalent forms to solve problems.	
M.A.HS. 9 – Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal and explain properties of the quantity represented in the expression. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Determine a quadratic equation when given its graph or roots. d. Use the properties of exponents to transform expressions for exponential functions.	M.AAS.A.HS.9 – Identify the expression that is the same as the one shown. (limit to two operations e.g. x^2 + 3x is the same as x(x+3).
Arithmetic with Polynomials and Rational Expressions	
Rewrite rational expressions	
M.A.HS.11- Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	M.AAS.A.HS.11- Add or subtract two polynomial expressions (limit to 2 terms each) with one variable.
Reasoning with Equations and Inequalities	
Solve equations and inequalities in one variable	
M.A.HS.17- Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	M.AAS.A.HS.17- Solve an equation of the form $ax + b = c$ where a, b, and c are positive whole numbers and the solution, x, is a positive whole number to represent a real-world problem.
M.A.HS.18- Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square and the quadratic formula, and factoring as appropriate to the initial form of the equation.	M.AAS.A.HS.18- Solve an equation of the form $x^2 = p$, where p is a perfect square less than or equal to 225.

Solve systems of equations.	
M.A.HS.19- Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	M.AAS.A.HS.19- Given a pair of equations, identify a coordinate pair that is the solution of both equations. (Limit to 1-step equations - e.g. x+y=8, y=x+1, or x+y=15, y=3.)
M.A.HS.20- Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	M.AAS.A.HS.20- Name the coordinate pair of the intersection of two lines in a coordinate plane.
M.A.HS.21- Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.	M.AAS.A.HS.21- Identify the coordinate pairs of the solutions of the graph of an intersecting quadratic function and linear function in Quadrant 1.
Represent and solve equations and inequalities graphically.	
M.A.HS.22- Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	M.AAS.A.HS.22- Given the graph of a linear equation in quadrant 1, identify a point on the graph and its corresponding ordered pair that is a solution to the equation.
M.A.HS.23- Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.	M.AAS.A.HS.23- Identify the point of intersection and its corresponding ordered pair for two lines graphed on a coordinate grid.
M.A.HS.24- Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	M.AAS.A.HS.24- Given the graph of a linear system of inequalities (limited to two inequalities), identify a point that represents a solution in the shaded region of the graph.

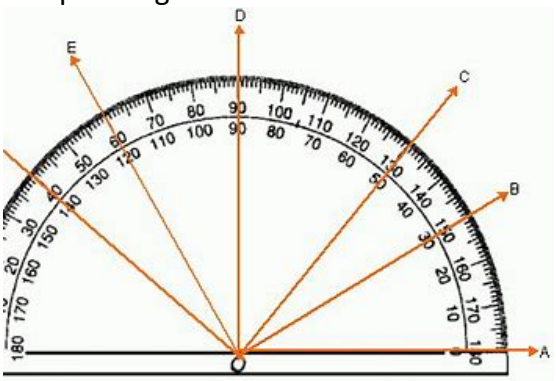
ALABAMA ALTERNATE ACHIEVEMENT STANDARDS Grade 10 Algebra IB	
General Education Standards	**Alabama Alternate Achievement Standards**
FUNCTIONS	
Interpreting Functions	
Understand the concept of a function and use function notation.	
M.F.HS.25- Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and x is an element of its domain, then *f(x)* denotes the output of *f* corresponding to the input x. The graph of *f* is the graph of the equation *y = f(x).*	M.AAS.F.HS.25- Identify graphs of functions.
M.F.HS.26- Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	M.AAS.F.HS.26- Substitute *x*-values into one-step linear equations in two variables (*y = x + p or y = px*) and solve for the *y*-values. (this could include the original information listed above and have students represent in data table)
M.F.HS.27- Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.	M.AAS.F.HS.27- Given a sequence of numbers, identify the rule that will give you the next number in the sequence. (Limit to expressions with simple arithmetic (adding or subtracting) or geometric (multiplying or dividing) operations.
Interpret functions that arise in applications in terms of the context.	
M.F.HS.28- For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity*.	M.AAS.F.HS.28- Given a linear graph, identify characteristics of the line in the graph (limit to y-intercept, x-intercept, increasing, decreasing).
M.F.HS.29- Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.	M.AAS.F.HS.29- Given the graph of a linear function with a finite domain evident in the graph, identify the domain (limit to first quadrant values between 0 and 10).
M.F.HS.30- Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.	M.AAS.F.HS.30- Given two points on the graph of the line, describe how the *y*-values change compared to the *x*-values for a given interval.
Analyze functions using different representations.	

M.F.HS.31- Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions, and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.	M.AAS.F.HS.31- Given the graph of a quadratic function, identify characteristics of the parabola in the graph (limit to first quadrant, maximum, minimum, x-intercepts).
M.F.HS.32- Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. b. Use the properties of exponents to interpret expressions for exponential functions.	M.AAS.F.HS.32- Identify the y-intercept of a linear equation in the form of y=mx+b as (0,b).
M.F.HS.33- Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	M.AAS.F.HS.33- Compare the y-intercept, slope (increasing/decreasing), or domain of two linear functions represented by a table or a graph.
Building functions	
Build a function that models a relationship between two quantities.	
M.F.HS.34- Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations.	M.AAS.F.HS.34- Select the appropriate graphical representation (first quadrant) given a situation involving a constant rate of change (slope).
M.F.HS.35- Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.	M.AAS.F.HS.35- Determine an arithmetic sequence with whole numbers when provided a recursive rule. (limit rule to whole numbers involving addition/subtraction or multiplication or division - e.g., start with the number 4. Each term in the sequence is found by taking the previous term and adding 8. Find the next 3 terms.)
Build new functions from existing functions.	
M.F.HS.36- Identify the effect on the graph of replacing *f(x)* by *f(x) + k, k f(x), f(kx),* and *f(x + k)* for specific values of *k* (both positive and negative); find the value of *k* given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.	M.AAS.F.HS.36- Given the graph of a linear function f(*x*), identify f(*x*) + *k*.
Linear, quadratic, and exponential models	
Construct and compare linear, quadratic, and exponential models and solve problems.	

M.F.HS.37- Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. b. Recognize situations in which one-quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	M.AAS.F.HS.37- Recognize real-world situations that are modeled with linear functions.
M.F.HS.38- Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	M.AAS.F.HS.38- Identify three points defined by a linear function from a table of values from 0 to 10.
M.F.HS.39- Observe, using graphs and tables, that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	M.AASF.HS.39- Given the graph of two functions, identify which function has a greater y-value for a specific x-value.
Interpret expressions for functions in terms of the situation they model.	
M.F.HS.40- Interpret the parameters in a linear or exponential function in terms of a context.	M.AAS.F.HS.40- Identify rate of change (slope) and starting value (*y*-intercept) in context.
STATISTICS AND PROBABILITY	
Interpreting Categorical and Quantitative Data	
Summarize, represent, and interpret data on a single count or measurement variable.	
M.SP.HS.41- Represent data with plots on the real number line (dot plots, histograms, and box plots).	M.AAS.SP.HS.41- Given data, construct a simple graph (line, pie, bar, picture) or table, and interpret the data in terms of range, mode, and median, mean.
M.SP.HS.42- Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	M.AAS.SP.HS.42- Given two dot plots representing two different data sets, identify which data set has the greater maximum, median, or range.
M.SP.HS.43- Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	M.AAS.SP.HS.43- Interpret general trends on a graph or chart (increase/decrease).
Summarize, represent, and interpret data on two categorical and quantitative variables.	
M.SP.HS.44- Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.	M.AAS.SP.HS.44- Calculate the mean of a given data set (number of data points limited to fewer than five, values of less than 10).
M.SP.HS.45- Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data.	M.AAS.SP.HS.45- Given a scatter plot with data with a line of best fit that can be represented by a linear function, describe what is happening to the *y*-values in reference to the *x*-values (*x* and *y* values limited positive numbers).

Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. b. Informally assess the fit of a function by plotting and analyzing residuals. c. Fit a linear function for a scatter plot that suggests a linear association.	
Interpret linear models.	
M.SP.HS.46- Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	M.AAS.SP.HS.46- Given a graph that describes a set of linear data, identify the rate of change (slope) and constant term (y-intercept). (Use context of data—the total price of the stamps is calculated by increasing 50 cents for every stamp purchased or the cost if no stamps are purchased is $0.)

ALABAMA ALTERNATE ACHIEVEMENT STANDARDS Grade 11 Geometry A	
General Education Standards	**Alabama Alternate Achievement Standards**
GEOMETRY	
Congruence	
Experiment with transformations in the plane.	
M.G.HS.1- Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	M.G.AAS.HS.1- Compare properties of perpendicular lines, parallel lines, line segments, angles, and circles.
M.G.HS.2- Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).	M.G.AAS.HS.2- Given a triangle on a coordinate grid, recognize the image of the triangle after a vertical or horizontal translation.
M.G.HS.3- Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	M.G.AAS.HS.3- Identify the reflection of a polygon.
M.G.HS.4- Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	M.G.AAS.HS.4- Given a geometric figure of a reflection or a translation of that figure, identify if the geometric figure is a reflection or translation.
M.G.HS.5- Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	M.G.AAS.HS.5- Given a figure and that figure after a vertical or horizontal translation, identify the vertical or horizontal translation.
Understand congruence in terms of rigid motions.	
M.G.HS.6- Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	M.G.AAS.HS.6- Identify corresponding congruent parts of transformed shapes (squares, rectangles, triangles, pentagons).
M.G.HS.7- Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	M.G.AAS.HS.7- Given two congruent triangles and side lengths of one of the triangles, identify the side lengths of the other triangle.
M.G.HS.8- Explain how the criteria for triangle congruence, angle-side-angle (ASA), side-angle-side (SAS), and side-side-side (SSS), follow from the definition of congruence in terms of rigid motions.	M.G.AAS.HS.8- Given two congruent triangles and angle measures of one of the triangles, identify the angle measures of the other triangle.

Prove geometric theorems.	
M.G.HS.9- Prove theorems about lines and angles. *Theorems include vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; and points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.*	M.G.AAS.HS.9- Given the intersection of two non-perpendicular lines and the measure of one angle, identify the measure of its vertical angle.
M.G.HS.10- Prove theorems about triangles. *Theorems include measures of interior angles of a triangle sum to 180º, base angles of isosceles triangles are congruent, the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length, and the medians of a triangle meet at a point.*	M.G.AAS.HS.10- Given a measure of a leg or base angle of an isosceles triangle, identify the measure of the other leg or other base angle.
M.G.HS.11- Prove theorems about parallelograms. *Theorems include opposite sides are congruent, opposite angles are congruent; the diagonals of a parallelogram bisect each other; and conversely, rectangles are parallelograms with congruent diagonals.*	M.G.AAS.HS.11- Given the measure of one side or one angle of a parallelogram, identify the measure of the opposite side or opposite angle.
Make geometric constructions.	
M.G.HS.12- Make formal geometric constructions with a variety of tools and methods such as compass and straightedge, string, reflective devices, paper folding, and dynamic geometric software. *Constructions include copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.*	M.G.AAS.HS.12- Given a drawing with angles and a protractor overlay, determine which angles are congruent. Sample image below. 
M.G.HS.13- Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.	M.G.AAS.HS.13- Identify an equilateral triangle from a set of triangles or identify a regular hexagon from a set of hexagons. Make sure sides/angles are marked so that students can identify congruence.

ALABAMA ALTERNATE ACHIEVEMENT STANDARDS Grade 12 Geometry B	
General Education Standards	**Alabama Alternate Achievement Standards**
Expressing Geometric Properties with Equations	
Translate between the geometric description and the equation for a conic section.	
M.G.HS.29- Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	M.G.AAS.HS.29- Given a circle graphed on the coordinate plane and a point on the edge of the circle, determine the length of the radius of the circle.
Use coordinates to prove simple geometric theorems algebraically.	
M.G.HS.30- Use coordinates to prove simple geometric theorems algebraically.	M.G.AAS.HS.30- Given a rectangle plotted on a coordinate grid with sides parallel to the *x*- and *y*-axis, determine the lengths of the sides to verify that opposite sides have the same length.
M.G.HS.31- Prove the slope criteria for parallel and perpendicular lines, and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).	M.G.AAS.HS.31- Given a set of parallel lines in a coordinate plane and the slope of one of the lines, identify the slope of the other line.
M.G.HS.32- Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	M.G.AAS.HS.32- Identify the midpoint between two points on a vertical or horizontal line.
M.G.HS.33- Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.	M.G.AAS.HS.33- Given a graph of a square, a rectangle, or a right triangle in the first quadrant, find the area and perimeter of the figure. (limit to squares/rectangles with sides parallel to axes and right triangles with legs parallel to axes)
Use coordinates to prove simple geometric theorems algebraically	
M.G.HS.34- Determine areas and perimeters of regular polygons, including inscribed or circumscribed polygons, given the coordinates of vertices or other characteristics	M.G.AAS.HS.34- Find the perimeter of an equilateral triangle, square, or regular pentagon given the length of one side.
Geometric Measurement and Dimensions	
Explain volume formulas and use them to solve problems.	
M.G.HS.35- Give an informal argument for the formulas for the circumference of a circle; area of a circle; and volume of a cylinder, pyramid, and cone. *Use dissection arguments, Cavalieri's principle, and informal limit arguments.*	M.G.AAS.HS.35- Make a prediction about the volume of a container, the area of a figure, or the perimeter of a figure. Ex: how many cubes will go in one figure vs. another. Limit to cylinder, circle.
M.G.HS.36- Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.	M.G.AAS.HS.36- Given a cylinder and a cone with the same height and radius, identify that the volume of the cone will be one-third the volume of the cylinder.
M.G.HS.37- Determine the relationship between surface areas of similar figures and volumes of similar figures	M.G.AAS.HS.37- Identify that a rectangle with sides that are two times as large as another rectangle will have an area that is four times as large by using models.

Visualize relationships between two-dimensional and three-dimensional objects.	
M.G.HS.38- Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	M.G.AAS.HS.38- Identify the shapes of two-dimensional cross-sections of three-dimensional objects (limited to sphere, rectangular prism, triangular prism).
Modeling With Geometry	
Apply geometric concepts in modeling situations.	
M.G.HS.39- Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).	M.G.AAS.HS.39- Identify objects that have a similar shape to a cylinder, rectangular prism, and cone.
M.G.HS.40- Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, British Thermal Units (BTUs) per cubic foot).	M.G.AAS.HS.40- Perform computation operations (addition, subtraction, multiplication, division) in context-based problems about weight, length, or capacity using units.
M.G.HS.41- Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost, working with typographic grid systems based on ratios).	M.G.AAS.HS.41- Solve a context-based problem involving area of rectangles.

MATHEMATICS
Alabama Alternate Achievement Standards