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Overview

Sunshine State Standards: Mathematics

History

The Sunshine State Standards were first approved by the State Board of Education in 1996 as a means of identifying academic expectations for student achievement in Florida. These original standards were written in several subject areas and were divided into four separate grade clusters (PreK-2, 3-5, 6-8, 9-12). This format was chosen to provide flexibility to school districts in designing curriculum based on local needs.

As Florida moved toward greater accountability for student achievement at each grade level, the Sunshine State Standards were further defined with specific “Grade Level Expectations” added over time. As time went on, two realities appeared that magnified the need to increase the level of rigor, coherence, and clarity in Florida’s academic standards. First, it was recognized that the level of rigor in the 1996 standards was inadequate to address the increased levels of achievement registered by our students. Second, ample evidence from both national and international measures of student achievement indicated the urgent need for higher levels of challenge for all our students. This could not occur without a serious effort to increase the level of rigor and expectations across the board for all Florida students.

The Department of Education recognized the need for a systematic approach to review and revise all of the academic standards, and on January 17, 2006, the State Board of Education adopted a six-year cycle that set forth a schedule of the regular review and revision of all K-12 content standards. (<http://www.flstandards.org>) This move went far beyond increasing the rigor of the standards; however, it included this alignment of the new standards with assessments, instructional materials, professional development, and teacher licensure exams. This way, the new standards and their higher levels of rigor will be fully integrated into the entire culture of K-12 instruction. This move sets the stage for higher levels of rigor and higher academic achievement for years to come.

A Commitment to Excellence

In 2006, the Florida legislature boldly stated its commitment to higher and more challenging standards for Florida’s children by passing HB 7087. Florida law now reads:

§1001.03(1) ...The state board shall establish a schedule to facilitate the periodic review of the standards to ensure adequate rigor, relevance, logical student progression, and integration of reading, writing, and mathematics across all subject areas.

This is a commitment that is shared by educators across Florida, as evidenced by the overwhelming level of public feedback to this revision process. Our goal now is to move forward with confidence and a sense of purpose as we begin implementing these higher and more rigorous standards.

Many people were involved in the review and revision of the mathematics standards. We extend our thanks to all of the teachers and members of the public for their active interest in this important area of work, and we look forward to continuing to work with them as partners in implementing these higher expectations for all of Florida's students.

Jeanine Blomberg
Commissioner of Education

Mathematics Standards Revision Process

In September 2006, the Office of Math and Science convened a committee to consider the framework for the revision of the Sunshine State Standards for mathematics. Taking into account research in mathematics education, a major goal of the revision of the Sunshine State Standards would be to strive for consensus amongst content experts, educational experts, researchers, parents, teachers, and members of the business and workforce community.

Experts in national and international mathematics curriculum articulated their analyses of the 1996 Sunshine State Standards for mathematics benchmarks and grade level expectations to the framers. These experts also presented research on the standards used by other states and the countries that lead the world in student achievement. There was agreement by all reviewers that Florida's standards fit the description of "a mile wide and an inch deep" and lacked coherence. The content of these presentations may be found online at www.flstandards.org. Combined with their own expertise in mathematics curriculum, the framers used this information to define the structure and provide recommendations that would become the guiding principles for the writers of the standards to follow.

From October 2006 to January 2007, the writers committee met to write the new standards and benchmarks according to the structure that the framers set. This was an iterative process, with the framers reviewing the work and providing comments to the writers. Responding to calls for clarity, coherence, and minimal redundancy, the numbers of K-8 grade level expectations were reduced from an average of more than 80 per grade to an average of less than 20 benchmarks per grade. High school benchmarks went from 9-12 grade bands in the 1996 standards to specific benchmarks for content including, for the first time, Calculus, Discrete Math, Trigonometry, and Financial Literacy standards.

From February 2007 to March 2007, the drafts of the standards were provided to the public via online sources and through public forums in various counties in the state of Florida. Online reviewers were able to rate the benchmarks and provide comment. Online reviewers provided 43,025 ratings of 504 draft standards and benchmarks. Of these reviewers, 1,391 interested persons completed the visitor profile. These reviewers identified themselves, in descending order of numbers of reviewers, as teachers, administrators, district staff, other interested persons, parents, and no response. Additionally, experts in mathematics and mathematics curriculum were gathered to provide an in-depth review of the drafts for comment and revision.

From April 2007 to June 2007, the benchmarks were revised based on the considerable input from the committees and other reviewers. The names of the framers, speakers, writers, and expert review panelists are included in the Acknowledgments section of this document.

Access Points for Students with Significant Cognitive Disabilities

As part of the revision to the Sunshine State Standards, access points for students with significant cognitive disabilities have been developed. These access points are expectations

written for students with significant cognitive disabilities to access the general education curriculum. Embedded in the Sunshine State Standards, access points reflect the core intent of the standards with reduced levels of complexity. The three levels of complexity include participatory, supported, and independent with the participatory level being the least complex. The new Florida Alternate Assessment will measure achievement on the Access Points.

The Access Points for the Mathematics Sunshine State Standards were developed through the cooperative efforts of writing teams composed of Florida educators and parents under the direction of staff from the Accommodations and Modifications for Students with Disabilities Project, the Accountability and Assessment for Students with Disabilities Project, and the Florida Department of Education

Structure of the Standards Documents

The new world-class Sunshine State Standards for mathematics are organized by grade level for grades K-8 and by Bodies of Knowledge for grades 9-12. This structure was determined by the Framers Committee based on review of the issues presented by experts and research in curriculum standards. The Bodies of Knowledge do not comprise courses. Standards and benchmarks will be pulled from the various Bodies of Knowledge to write specific courses in mathematics at the secondary level.

The model for writing the standards for the K-8 standards was provided by a 2006 document from the National Council of Teachers of Mathematics (NCTM) entitled Curriculum Focal Points: A Quest for Coherence.

Standards at each of the K-8 grade levels are termed Big Ideas and Supporting Ideas. The set of standards for each grade level consists of three Big Ideas and varying numbers of Supporting Ideas. Supporting Ideas are not meant to be subordinate to Big Ideas, but rather they serve to provide connections between topics at different grade levels.

At the high school level, the mathematics standards are organized into familiar Bodies of Knowledge such as Algebra, Geometry, Trigonometry, Calculus, Probability, and Statistics. There are two Bodies of Knowledge that may not be recognized as the traditional mathematics curriculum. They are Discrete Mathematics and Financial Literacy.

Discrete Mathematics consists of many of the topics in mathematics that are becoming more and more important in the modern era. For example, all computer and electronic applications of mathematics are necessarily discrete. Some of the topics in Discrete Math include set theory, graph theory, matrix algebra, recursive functions, and more.

Florida is introducing a Body of Knowledge in mathematics entitled Financial Literacy. This Body of Knowledge has been created in response to the combination of a long history of financial matters in mathematics education, the near-universal relevance of financial matters and mathematics in people's lives, and the development of financial mathematics programs at university levels. The standards and benchmarks in the Financial Literacy Body of Knowledge involve high-level, complex mathematics applications. The Financial Literacy

Body of Knowledge is intended to provide students with an opportunity to learn and use mathematics in an applied manner, thereby supporting their understanding of mathematics, their own financial well-being, and the health of the economic system in which we all operate.

With people from many aspects of the education community involved with writing, reviewing, and revising the standards, the 2007 revision of the Sunshine State Standards for mathematics are truly the stakeholder's standards. The Office of Math and Science is incredibly grateful for the intensity of the work that was performed in writing these standards.

Mary Jane Tappen
Executive Director of Florida's Office of Math and Science

Acknowledgments

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FLORIDA MATHEMATICS STANDARDS

K-8 GRADE-LEVEL STANDARDS

Big Ideas

Big Ideas are standards that are aligned with the *Curriculum Focal Points* released by the National Council of Teachers of Mathematics (NCTM). They include standards which should be the primary focus of mathematics instruction for each grade level, K-8. Establishing proficiency with these standards at each successive grade level will prepare a strong foundation for learning mathematics in subsequent grades.

There are three Big Ideas for each grade. The Big Ideas do not address the same topics for each grade, recognizing that at each level there are certain skills which must be honed to prepare students for more rigorous instruction as they move to the next grade. The order of the Big Idea standards does not determine the order of instruction nor does it indicate that one idea requires greater instructional emphasis. The Big Ideas are assigned numbers 1, 2, or 3 without regard to the content in each of them.

Supporting Ideas

Supporting ideas are standards which are fundamental to sound mathematics instruction. Also aligned with the *Curriculum Focal Points*, Supporting Ideas are not less important than the Big Ideas but are key components to a structurally sound mathematics education.

Supporting Ideas are standards that serve one or more of the following purposes:

- 1) Establishing connections to and between the strands of mathematics as defined by NCTM (Probability has been extracted from Data Analysis and stands alone.);
- 2) Preparing students for future mathematics teaching and learning by focusing on conceptual understanding of concepts; and
- 3) Addressing gaps in instruction that may appear insignificant but are important to the understanding, fluency, and application of mathematics ideas to problem solving. The

Benchmark Coding Scheme

MA.	5.	A.	1.	1
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Benchmark

Body of Knowledge Key:

- A ~ Algebra
- C ~ Calculus
- D ~ Discrete Mathematics
- F ~ Financial Literacy
- G ~ Geometry
- P ~ Probability
- S ~ Statistics
- T ~ Trigonometry

Access Points Coding Scheme

MA.	5.	A.	1.	In.a
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Access Point

Access Points Key:

- In ~ Independent
- Su ~ Supported
- Pa ~ Participatory

Kindergarten

Benchmark Coding Scheme

MA.	K.	A.	1.	1
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Benchmark

Body of Knowledge Key:

A ~ Algebra

C ~ Calculus

D ~ Discrete Mathematics

F ~ Financial Literacy

G ~ Geometry

P ~ Probability

S ~ Statistics

T ~ Trigonometry

Access Points Coding Scheme

MA.	K.	A.	1.	In.a
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Access Point

Access Points Key:

In ~ Independent

Su ~ Supported

Pa ~ Participatory

K-8 MATHEMATICS STANDARDS

GRADE K

BIG IDEA 1: *Represent, compare, and order whole numbers and join and separate sets.*

BENCHMARK CODE	BENCHMARK
MA.K.A.1.1	Represent quantities with numbers up to 20, verbally, in writing, and with manipulatives.
MA.K.A.1.2	Solve problems including those involving sets by counting, by using cardinal and ordinal numbers, by comparing, by ordering, and by creating sets up to 20.
MA.K.A.1.3	Solve word problems involving simple joining and separating situations.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.K.A.1.In.a Represent quantities to 5 using sets of objects and number names.</p> <p>MA.K.A.1.In.b Use one-to-one correspondence to count and compare sets of objects to 5.</p> <p>MA.K.A.1.In.c Solve problems with up to 5 objects, involving simple joining (putting together) and separating (taking away) situations.</p>	<p>MA.K.A.1.Su.a Represent quantities to 3 using sets of objects and number names.</p> <p>MA.K.A.1.Su.b Use one-to-one correspondence to count sets of objects to 3.</p> <p>MA.K.A.1.Su.c Solve problems with up to 3 objects involving simple joining (putting together) situations.</p>	<p>MA.K.A.1.Pa.a Respond to a prompt to indicate desire for more of a preferred, familiar action or object.</p> <p>MA.K.A.1.Pa.b Respond to a prompt to indicate desire to stop an action or activity.</p> <p>MA.K.A.1.Pa.c Respond to a counting cue to begin a familiar routine.</p> <p>MA.K.A.1.Pa.d Demonstrate a favorable or positive response to a preferred stimulus.</p>

BIG IDEA 2: Describe shapes and space.

BENCHMARK CODE	BENCHMARK
MA.K.G.2.1	Describe, sort and re-sort objects using a variety of attributes such as shape, size, and position.
MA.K.G.2.2	Identify, name, describe and sort basic two-dimensional shapes such as squares, triangles, circles, rectangles, hexagons, and trapezoids.
MA.K.G.2.3	Identify, name, describe, and sort three-dimensional shapes such as spheres, cubes and cylinders.
MA.K.G.2.4	Interpret the physical world with geometric shapes and describe it with corresponding vocabulary.
MA.K.G.2.5	Use basic shapes, spatial reasoning, and manipulatives to model objects in the environment and to construct more complex shapes.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.K.G.2.In.a Sort objects by single attributes, including shape and size.</p> <p>MA.K.G.2.In.b Match and name two-dimensional shapes, including circle and square.</p> <p>MA.K.G.2.In.c Match examples of three-dimensional objects, such as balls (spheres) and blocks (cubes).</p> <p>MA.K.G.2.In.d Identify shapes, including circle and square, in the environment.</p> <p>MA.K.G.2.In.e Identify spatial relationships, including in, out, up, down, top, bottom, on, and off.</p>	<p>MA.K.G.2.Su.a Identify square objects or pictures when given the name.</p> <p>MA.K.G.2.Su.b Identify three-dimensional objects, such as a block (cube) or ball (sphere).</p> <p>MA.K.G.2.Su.c Identify square shapes in the environment when given the name.</p> <p>MA.K.G.2.Su.d Identify spatial relationships, including on, off, up, and down.</p>	<p>MA.K.G.2.Pa.a Respond to a prompt to identify a familiar three-dimensional object in a familiar routine.</p> <p>MA.K.G.2.Pa.b Respond to one directional prompt in a familiar routine.</p>

BIG IDEA 3: Order objects by measurable attributes.

BENCHMARK CODE	BENCHMARK
MA.K.G.3.1	Compare and order objects indirectly or directly using measurable attributes such as length, height, and weight.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
MA.K.G.3.In.a Compare overall size and length of objects and describe using terms such as big, small, long, and short.	MA.K.G.3.Su.a Identify size of objects using terms such as big and little.	MA.K.G.3.Pa.a Respond to differences in familiar persons, actions, or objects within a familiar routine.

SUPPORTING IDEAS

Algebra

BENCHMARK CODE	BENCHMARK
MA.K.A.4.1	Identify and duplicate simple number and non-numeric repeating and growing patterns.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
MA.K.A.4.In.a Match two-element repeating patterns of sounds, physical movements, and objects.	MA.K.A.4.Su.a Match identical sounds, physical movements, and objects.	MA.K.A.4.Pa.a Demonstrate distinctive responses to preferred vs. non-preferred stimuli in a familiar routine.

SUPPORTING IDEAS

Geometry and Measurement

BENCHMARK CODE	BENCHMARK	
MA.K.G.5.1	Demonstrate an understanding of the concept of time using identifiers such as morning, afternoon, day, week, month, year, before/after, and shorter/longer.	
Access Points for Students with Significant Cognitive Disabilities		
<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
MA.K.G.5.In.a Identify concepts of time, including day, night, morning, and afternoon, by relating activities to a time period.	MA.K.G.5.Su.a Identify concepts of time, including day and night, by relating daily events to a time period.	MA.K.G.5.Pa.a Respond to the environmental cue for a preferred activity within a regularly scheduled routine.

Grade 1

Benchmark Coding Scheme

MA.	1.	A.	1.	1
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Benchmark

Body of Knowledge Key:

- A ~ Algebra
- C ~ Calculus
- D ~ Discrete Mathematics
- F ~ Financial Literacy
- G ~ Geometry
- P ~ Probability
- S ~ Statistics
- T ~ Trigonometry

Access Points Coding Scheme

MA.	1.	A.	1.	In.a
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Access Point

Access Points Key:

- In ~ Independent
- Su ~ Supported
- Pa ~ Participatory

K-8 MATHEMATICS STANDARDS

GRADE 1

BIG IDEA 1: *Develop understandings of addition and subtraction strategies for basic addition facts and related subtraction facts.*

BENCHMARK CODE	BENCHMARK
MA.1.A.1.1	Model addition and subtraction situations using the concepts of “part-whole,” “adding to,” “taking away from,” “comparing,” and “missing addend.”
MA.1.A.1.2	Identify, describe, and apply addition and subtraction as inverse operations.
MA.1.A.1.3	Create and use increasingly sophisticated strategies, and use properties such as Commutative, Associative and Additive Identity, to add whole numbers.
MA.1.A.1.4	Use counting strategies, number patterns, and models as a means for solving basic addition and subtraction fact problems.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.1.A.1.In.a Identify the meaning of addition as adding to and subtraction as taking away from.</p> <p>MA.1.A.1.In.b Use counting and one-to-one correspondence as strategies to solve addition facts with sums to 10 and related subtraction facts represented by numerals with sets of objects and pictures.</p>	<p>MA.1.A.1.Su.a Demonstrate understanding of the meaning of joining (putting together) and separating (taking apart) sets of objects.</p> <p>MA.1.A.1.Su.b Use one-to-one correspondence as a strategy for solving simple number stories involving joining (putting together) and separating (taking apart) with sets of objects to 5.</p>	<p>MA.1.A.1.Pa.a Respond to the arrival of a familiar person or addition of a familiar object in a routine.</p> <p>MA.1.A.1.Pa.b Respond to the departure of a familiar person or removal of a familiar object in a routine.</p>

BIG IDEA 2: Develop an understanding of whole number relationships, including grouping by tens and ones.

BENCHMARK CODE	BENCHMARK
MA.1.A.2.1	Compare and order whole numbers at least to 100.
MA.1.A.2.2	Represent two digit numbers in terms of tens and ones.
MA.1.A.2.3	Order counting numbers, compare their relative magnitudes, and represent numbers on a number line.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.1.A.2.In.a Compare and order numbers 1 to 10.</p> <p>MA.1.A.2.In.b Use one-to-one correspondence to count sets of objects or pictures to 10.</p> <p>MA.1.A.2.In.c Represent numbers to 10 using sets of objects and pictures, number names, and numerals.</p>	<p>MA.1.A.2.Su.a Use one-to-one correspondence to compare sets of objects to 5.</p> <p>MA.1.A.2.Su.b Use one-to-one correspondence to count sets of objects to 5 arranged in a row.</p> <p>MA.1.A.2.Su.c Represent quantities to 5 using sets of objects and number names.</p>	<p>MA.1.A.2.Pa.a Respond to a prompt to indicate desire for more of two or more preferred actions or objects in a familiar routine.</p> <p>MA.1.A.2.Pa.b Respond to a prompt to indicate desire to stop two or more actions in a familiar routine.</p> <p>MA.1.A.2.Pa.c Respond to a counting cue to begin two or more familiar routines.</p>

BIG IDEA 3: Compose and decompose two-dimensional and three-dimensional geometric shapes.

BENCHMARK CODE	BENCHMARK
MA.1.G.3.1	Use appropriate vocabulary to compare shapes according to attributes and properties such as number and lengths of sides, and number of vertices.
MA.1.G.3.2	Compose and decompose plane and solid figures, including making predictions about them, to build an understanding of part-whole relationships and properties of shapes.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.1.G.3.In.a Sort and describe two-dimensional shapes by single attributes such as number of sides and straight or round sides.</p> <p>MA.1.G.3.In.b Identify examples of three-dimensional objects, including sphere and cube.</p> <p>MA.1.G.3.In.c Combine two shapes to make another shape and identify the whole-part relationship.</p> <p>MA.1.G.3.In.d Describe spatial relationships, including over, under, front, back, and between.</p>	<p>MA.1.G.3.Su.a Match common two-dimensional objects by shape, including square and circle.</p> <p>MA.1.G.3.Su.b Name two-dimensional shapes, including circle and square.</p> <p>MA.1.G.3.Su.c Sort common two- and three-dimensional objects by size, including big and little.</p> <p>MA.1.G.3.Su.d Identify spatial relationships, including in, out, top, and bottom.</p>	<p>MA.1.G.3.Pa.a Respond to a prompt to identify a familiar object with a two-dimensional shape, such as circle or square in familiar routines.</p> <p>MA.1.G.3.Pa.b Respond to a prompt to identify two or more familiar three-dimensional objects in familiar routines.</p> <p>MA.1.G.3.Pa.c Demonstrate awareness of one discrete location (area) in the learning environment.</p> <p>MA.1.G.3.Pa.d Respond to two directional prompts in familiar routines.</p>

SUPPORTING IDEAS

Algebra

BENCHMARK CODE	BENCHMARK	
MA.1.A.4.1	Extend repeating and growing patterns, fill in missing terms, and justify reasoning.	
Access Points for Students with Significant Cognitive Disabilities		
Independent:	Supported:	Participatory:
MA.1.A.4.In.a Match a two-element repeating visual pattern.	MA.1.A.4.Su.a Match objects by single attributes such as color, shape, or size.	MA.1.A.4.Pa.a Indicate anticipation of next step in a familiar routine or activity.

SUPPORTING IDEAS

Geometry and Measurement

BENCHMARK CODE	BENCHMARK	
MA.1.G.5.1	Measure by using iterations of a unit and count the unit measures by grouping units.	
MA.1.G.5.2	Compare and order objects according to descriptors of length, weight and capacity.	
Access Points for Students with Significant Cognitive Disabilities		
Independent:	Supported:	Participatory:
<p>MA.1.G.5.In.a Measure length of objects using nonstandard units of measure and count the units.</p> <p>MA.1.G.5.In.b Compare objects by concepts of length, using terms like longer, shorter, and same; and capacity, using terms like full and empty.</p> <p>MA.1.G.5.In.c Identify concepts of time, including before, after, and next, by relating daily events to a time period.</p>	<p>MA.1.G.5.Su.a Measure length of objects using nonstandard units of measure.</p> <p>MA.1.G.5.Su.b Compare objects by length using terms like long and short.</p> <p>MA.1.G.5.Su.c Identify the concepts of time, including morning and afternoon, by relating daily events to a time period.</p>	<p>MA.1.G.5.Pa.a Respond to differences in familiar persons, actions, or objects in two or more familiar routines.</p> <p>MA.1.G.5.Pa.b Respond to the environmental cue for preferred activities within regularly scheduled routines.</p>

SUPPORTING IDEAS

Number and Operations

BENCHMARK CODE	BENCHMARK	
MA.1.A.6.1	Use mathematical reasoning and beginning understanding of tens and ones, including the use of invented strategies, to solve two-digit addition and subtraction problems	
MA.1.A.6.2	Solve routine and non-routine problems by acting them out, using manipulatives, and drawing diagrams	
Access Points for Students with Significant Cognitive Disabilities		
<i>Independent:</i> MA.1.A.6.In.a Solve real-world problems involving addition facts with sums to 10 and related subtraction facts using numerals with sets of objects and pictures.	<i>Supported:</i> MA.1.A.6.Su.a Solve real-world problems involving simple joining (putting together) and separating (taking apart) situations with sets of objects to 5.	<i>Participatory:</i> MA.1.A.6.Pa.a Demonstrate distinctive responses to preferred vs. non-preferred stimuli in two familiar routines.

Grade 2

Benchmark Coding Scheme

MA.	2.	A.	1.	1
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Benchmark

Body of Knowledge Key:

A ~ Algebra

C ~ Calculus

D ~ Discrete Mathematics

F ~ Financial Literacy

G ~ Geometry

P ~ Probability

S ~ Statistics

T ~ Trigonometry

Access Points Coding Scheme

MA.	2.	A.	1.	In.a
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Access Point

Access Points Key:

In ~ Independent

Su ~ Supported

Pa ~ Participatory

K-8 MATHEMATICS STANDARDS

GRADE 2

BIG IDEA 1: *Develop an understanding of base-ten numerations system and place-value concepts.*

BENCHMARK CODE	BENCHMARK
MA.2.A.1.1	Identify relationships between the digits and their place values through the thousands, including counting by tens and hundreds.
MA.2.A.1.2	Identify and name numbers through thousands in terms of place value and apply this knowledge to expanded notation.
MA.2.A.1.3	Compare and order multi-digit numbers through the thousands.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.2.A.1.In.a Apply the concept of grouping to create sets of tens and ones to 20 as a strategy to aid in counting.</p> <p>MA.2.A.1.In.b Represent numbers to 20 using sets of objects and pictures, number names, and numerals.</p> <p>MA.2.A.1.In.c Identify and use ordinal numbers to fifth.</p> <p>MA.2.A.1.In.d Use one-to-one correspondence to count, compare, and order whole numbers 0 to 20.</p>	<p>MA.2.A.1.Su.a Represent quantities to 5 or more using sets of objects, number names, and numerals.</p> <p>MA.2.A.1.Su.b Use one-to-one correspondence to count, compare, and order sets of objects to 5 or more.</p>	<p>MA.2.A.1.Pa.a Indicate desire to continue an action or activity by using an object in familiar routines.</p> <p>MA.2.A.1.Pa.b Respond to familiar actions that represent the concept of none or stop in routines.</p> <p>MA.2.A.1.Pa.c Respond to a counting cue to begin familiar routines in multiple settings.</p> <p>MA.2.A.1.Pa.d Match one object to a designated space to show one-to-one correspondence.</p>

BIG IDEA 2: Develop quick recall of addition facts and related subtraction facts and fluency with multi-digit addition and subtraction.

BENCHMARK CODE	BENCHMARK
MA.2.A.2.1	Recall basic addition and related subtraction facts.
MA.2.A.2.2	Add and subtract multi-digit whole numbers through three digits with fluency by using a variety of strategies, including invented and standard algorithms and explanations of those procedures.
MA.2.A.2.3	Estimate solutions to multi-digit addition and subtraction problems, through three digits.
MA.2.A.2.4	Solve addition and subtraction problems that involve measurement and geometry.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.2.A.2.In.a Identify the meaning of the +, -, and = signs in addition and subtraction problems.</p> <p>MA.2.A.2.In.b Use counting and one-to-one correspondence as strategies to solve problems involving addition facts with sums to 10 and related subtraction facts using numerals with sets of pictures.</p> <p>MA.2.A.2.In.c Solve real-world problems involving addition facts with sums to 10 and related subtraction facts, including money, measurement, geometry, and other problem situations.</p>	<p>MA.2.A.2.Su.a Identify the meaning of addition as adding to and subtraction as taking away from, using sets of objects.</p> <p>MA.2.A.2.Su.b Use counting and one-to-one correspondence as strategies to solve number stories involving addition facts with sums to 5 and related subtraction facts using sets of objects.</p> <p>MA.2.A.2.Su.c Solve real-world problems involving addition facts with sums to 5 and related subtraction facts using sets of objects.</p>	<p>MA.2.A.2.Pa.a Respond to the arrival of a familiar person or addition of a familiar object in the same activity in multiple settings.</p> <p>MA.2.A.2.Pa.b Respond to the departure of a familiar person or removal of a familiar object in the same activity in multiple settings.</p> <p>MA.2.A.2.Pa.c Continue in a routine with the addition of a familiar person, action, or object.</p> <p>MA.2.A.2.Pa.d Continue in a familiar routine with the removal of a familiar person, action, or object.</p> <p>MA.2.A.2.Pa.e Initiate a preferred action or activity by using an object.</p>

BIG IDEA 3: Develop an understanding of linear measurement and facility in measuring lengths.

BENCHMARK CODE	BENCHMARK
MA.2.G.3.1	Estimate and use standard units, including inches and centimeters, to partition and measure lengths of objects.
MA.2.G.3.2	Describe the inverse relationship between the size of a unit and number of units needed to measure a given object.
MA.2.G.3.3	Apply the Transitive Property when comparing lengths of objects.
MA.2.G.3.4	Estimate, select an appropriate tool, measure, and/or compute lengths to solve problems.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.2.G.3.In.a Use standard units of whole inches to measure the length of objects.</p> <p>MA.2.G.3.In.b Compare and order objects of different lengths.</p> <p>MA.2.G.3.In.c Select and use a ruler to measure and compare lengths to solve problems.</p>	<p>MA.2.G.3.Su.a Measure the length of objects using nonstandard units of measure and count to 5 or more units.</p> <p>MA.2.G.3.Su.b Compare lengths of objects to solve real-world problems.</p>	<p>MA.2.G.3.Pa.a Respond to a prompt indicating size or length, such as big, little, long, or short in activities.</p>

SUPPORTING IDEAS

Algebra

BENCHMARK CODE	BENCHMARK
MA.2.A.4.1	Extend number patterns to build a foundation for understanding multiples and factors – for example, skip counting by 2’s, 5’s, 10’s.
MA.2.A.4.2	Classify numbers as odd or even and explain why.
MA.2.A.4.3	Generalize numeric and non-numeric patterns using words and tables.
MA.2.A.4.4	Describe and apply equality to solve problems, such as in balancing situations.
MA.2.A.4.5	Recognize and state rules for functions that use addition and subtraction.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.2.A.4. In.a Identify two-element repeating visual patterns and extend with one repetition.</p> <p>MA.2.A.4.In.b Fill in missing items in two-element repeating visual patterns.</p> <p>MA.2.A.4.In.c Identify equal and unequal sets of objects and pictures to 20.</p>	<p>MA.2.A.4.Su.a Match two-element repeating patterns of sounds, physical movements, and objects.</p> <p>MA.2.A.4.Su.b Use one-to-one correspondence to identify sets of objects with the same number to 5.</p>	<p>MA.2.A.4.Pa.a Follow a two-element repeating pattern in a familiar routine or activity.</p> <p>MA.2.A.4.Pa.b Indicate anticipation of next step(s) in the same routine or activity in multiple settings.</p> <p>MA.2.A.4.Pa.c Recognize similarities and differences in features of familiar objects and actions in routines.</p>

SUPPORTING IDEAS

Geometry and Measurement

BENCHMARK CODE	BENCHMARK
MA.2.G.5.1	Use geometric models to demonstrate the relationships between wholes and their parts as a foundation to fractions.
MA.2.G.5.2	Identify time to the nearest hour and half hour.
MA.2.G.5.3	Identify, combine, and compare values of money in cents up to \$1 and in dollars up to \$100, working with a single unit of currency.
MA.2.G.5.4	Measure weight/mass and capacity/volume of objects. Include the use of the appropriate unit of measure and their abbreviations including cups, pints, quarts, gallons, ounces (oz), pounds (lbs), grams (g), kilograms (kg), milliliters (mL) and liters (L).

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.2.G.5.In.a Match parts with the whole using geometric shapes.</p> <p>MA.2.G.5.In.b Identify concepts of time, including yesterday, today, tomorrow, first, and next, by relating activities with the time period.</p> <p>MA.2.G.5.In.c Identify the days of the week in relation to the calendar.</p> <p>MA.2.G.5.In.d Identify analog and digital clocks as tools for telling time.</p> <p>MA.2.G.5.In.e Identify the purpose of coins and bills.</p> <p>MA.2.G.5.In.f Compare objects by weight, using terms including heavy and light; and capacity, using terms including holds more and holds less.</p>	<p>MA.2.G.5.Su.a Identify part and whole of geometric shapes.</p> <p>MA.2.G.5.Su.b Match common three-dimensional objects by shape, including sphere and cube.</p> <p>MA.2.G.5.Su.c Identify the concepts of time, including before, after, and next, by relating activities with the time period.</p> <p>MA.2.G.5.Su.d Identify coins as money.</p> <p>MA.2.G.5.Su.e Compare weight of objects using the concepts of heavy and light.</p> <p>MA.2.G.5.Su.f Identify and describe spatial relationships, including over, under, front, back, and between.</p>	<p>MA.2.G.5.Pa.a Respond to differences in features such as size and shape of familiar objects in routines.</p> <p>MA.2.G.5.Pa.b Respond to the environmental cue for a non-preferred activity within a regularly scheduled routine.</p> <p>MA.2.G.5.Pa.c Respond to icons or symbols representing activities in an adaptive schedule.</p> <p>MA.2.G.5.Pa.d Given a model, imitate one or more directional responses in a daily activity.</p>

SUPPORTING IDEAS

Number and Operations

BENCHMARK CODE	BENCHMARK
MA.2.A.6.1	Solve problems that involve repeated addition.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
MA.2.A.6.In.a Solve problems involving addition of the same number such as 1+1 or 2+2 with sums to 10.	MA.2.A.6.Su.a Solve problems involving combining sets with the same number of objects with sums to 4 using one-to-one correspondence and counting.	MA.2.A.6.Pa.a Communicate the desire for one preferred item or activity in familiar routines.

Grade 3

Benchmark Coding Scheme

MA.	3.	A.	1.	1
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Benchmark

Body of Knowledge Key:

- A ~ Algebra
- C ~ Calculus
- D ~ Discrete Mathematics
- F ~ Financial Literacy
- G ~ Geometry
- P ~ Probability
- S ~ Statistics
- T ~ Trigonometry

Access Points Coding Scheme

MA.	3.	A.	1.	In.a
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Access Point

Access Points Key:

- In ~ Independent
- Su ~ Supported
- Pa ~ Participatory

K-8 MATHEMATICS STANDARDS

GRADE 3

BIG IDEA 1: *Develop understandings of multiplication and division and strategies for basic multiplication facts and related division facts.*

BENCHMARK CODE	BENCHMARK
MA.3.A.1.1	Model multiplication and division including problems presented in context: repeated addition, multiplicative comparison, array, how many combinations, measurement, and partitioning.
MA.3.A.1.2	Solve multiplication and division fact problems by using strategies that result from applying number properties.
MA.3.A.1.3	Identify, describe, and apply division and multiplication as inverse operations.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.3.A.1.In.a Solve problems that involve combining (multiplying) equal sets with quantities to 18 using objects and pictures with numerals.</p> <p>MA.3.A.1.In.b Solve addition facts with sums to 18 and related subtraction one-digit fact families using the formal algorithm with numerals and signs (+, -, =).</p> <p>MA.3.A.1.In.c Use one-to-one correspondence, grouping, and counting as strategies to solve real-world problems involving addition facts with sums to 18 and related subtraction facts.</p> <p>MA.3.A.1.In.d Use objects and pictures to represent the inverse relationship between addition and subtraction facts.</p>	<p>MA.3.A.1.Su.a Solve addition facts with sums to 9 and related subtraction facts using numerals with objects and pictures.</p> <p>MA.3.A.1.Su.b Use one-to-one correspondence and counting as strategies to solve real-world problems with addition facts with sums to 9 and related subtraction facts.</p>	<p>MA.3.A.1.Pa.a Recognize when items have been added to or removed from groups of objects in daily activities.</p> <p>MA.3.A.1.Pa.b Continue in a routine with the addition or removal of a familiar person, action, or object in two or more settings.</p>

BIG IDEA 2: Develop an understanding of fractions and fraction equivalence.

BENCHMARK CODE	BENCHMARK
MA.3.A.2.1	Represent fractions, including fractions greater than one, using area, set and linear models.
MA.3.A.2.2	Describe how the size of the fractional part is related to the number of equal sized pieces in the whole.
MA.3.A.2.3	Compare and order fractions, including fractions greater than one, using models and strategies.
MA.3.A.2.4	Use models to represent equivalent fractions, including fractions greater than one, and identify representations of equivalence.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
MA.3.A.2.In.a Identify the relationship between half and whole.	MA.3.A.2.Su.a Identify part and whole of objects.	MA.3.A.2.Pa.a Respond to prompt to indicate desire for less in a familiar routine. MA.3.A.2.Pa.b Indicate desire for more in two or more routines or activities. MA.3.A.2.Pa.c Indicate none or stop in two or more routines or activities.

BIG IDEA 3: Describe and analyze properties of two-dimensional shapes.

BENCHMARK CODE	BENCHMARK
MA.3.G.3.1	Describe, analyze, compare and classify two-dimensional shapes using sides and angles – including acute, obtuse, and right angles – and connect these ideas to the definition of shapes.
MA.3.G.3.2	Compose, decompose, and transform polygons to make other polygons, including concave and convex polygons with three, four, five, six, eight, or ten sides.
MA.3.G.3.3	Build, draw and analyze two-dimensional shapes from several orientations in order to examine and apply congruence and symmetry.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.3.G.3.In.a Identify attributes, including number of sides, curved or straight sides, and number of corners (angles), in two-dimensional shapes.</p> <p>MA.3.G.3.In.b Combine (compose) and separate (decompose) two-dimensional shapes to make other shapes.</p> <p>MA.3.G.3.In.c Identify two-dimensional shapes that are the same shape and size (congruent).</p>	<p>MA.3.G.3.Su.a Sort two-dimensional shapes by single attributes, including numbers of sides and curved or straight sides.</p> <p>MA.3.G.3.Su.b Combine (compose) two shapes to make other shapes.</p> <p>MA.3.G.3.Su.c Match two-dimensional shapes that are the same shape and size (congruent).</p>	<p>MA.3.G.3.Pa.a Respond to a prompt to identify two or more familiar objects with two-dimensional shapes, such as circle and square in daily activities.</p> <p>MA.3.G.3.Pa.b Respond to similarities and differences in features of two or more familiar objects in routines.</p> <p>MA.3.G.3.Pa.c Given a model, imitate two or more directional responses in a daily activity.</p>

SUPPORTING IDEAS

Algebra

BENCHMARK CODE

BENCHMARK

MA.3.A.4.1

Create, analyze, and represent patterns and relationships using words, variables, tables and graphs.

Access Points for Students with Significant Cognitive Disabilities

Independent:

MA.3.A.4.In.a Complete growing visual and number patterns.

MA.3.A.4.In.b Identify the rule, including 1 more, 2 more and 3 more, represented in number pairs.

Supported:

MA.3.A.4.Su.a Match a two-element repeating visual pattern using objects and pictures.

MA.3.A.4.Su.b Use the rule 1 more to identify the next number with numbers 1 to 10.

Participatory:

MA.3.A.4.Pa.a Follow a two-element repeating pattern with two elements in two or more familiar routines or activities.

MA.3.A.4.Pa.b Identify items that belong together to complete a set in one routine or activity.

MA.3.A.4.Pa.c Communicate anticipation of next step(s) in a sequence of familiar activities.

SUPPORTING IDEAS

Geometry and Measurement

BENCHMARK CODE	BENCHMARK
MA.3.G.5.1	Select appropriate units, strategies and tools to solve problems involving perimeter.
MA.3.G.5.2	Measure objects using fractional parts of linear units such as $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{10}$.
MA.3.G.5.3	Tell time to the nearest minute and to the nearest quarter hour, and determine the amount of time elapsed.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.3.G.5.In.a Use a ruler to solve problems involving the length of sides of squares and rectangles.</p> <p>MA.3.G.5.In.b Measure length to the whole inch or foot, weight to the pound, and capacity to the cup to solve problems.</p> <p>MA.3.G.5.In.c Identify time to hour and half hour.</p> <p>MA.3.G.5.In.d Identify the months of the year in relation to calendars.</p>	<p>MA.3.G.5.Su.a Use nonstandard measurement units to solve problems for length of sides of squares.</p> <p>MA.3.G.5.Su.b Use nonstandard measurement units to solve problems with weight, including concepts of heavy and light.</p> <p>MA.3.G.5.Su.c Identify concepts of time, including yesterday, today, and tomorrow, by relating activities to the time period.</p> <p>MA.3.G.5.Su.d Identify the days of the week using a calendar.</p>	<p>MA.3.G.5.Pa.a Indicate area (location) of preferred object or activity within a learning environment.</p> <p>MA.3.G.5.Pa.b Associate the environmental cue related to time of an activity with an object, picture, or symbol used in a daily schedule.</p> <p>MA.3.G.5.Pa.c Identify an object, picture, or symbol associated with an activity in the daily schedule.</p>

SUPPORTING IDEAS

Number and Operations

BENCHMARK CODE	BENCHMARK
MA.3.A.6.1	Represent, compute, estimate and solve problems using numbers through hundred thousands.
MA.3.A.6.2	Solve non-routine problems by making a table, chart, or list and searching for patterns.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.3.A.6.In.a Express, represent, and use cardinal numbers 0 to 30 and ordinal numbers to tenth using sets of objects or pictures, number names, and numerals.</p> <p>MA.3.A.6.In.b Compare and order whole numbers 0 to 30 using objects, pictures, or tallies, and a number line..</p> <p>MA.3.A.6.In.c Apply the concepts of counting and grouping to create sets of tens and ones to identify the value of whole numbers to 30.</p> <p>MA.3.A.6.In.d Use skip counting by 5s to determine amounts to 30.</p>	<p>MA.3.A.6.Su.a Express and represent numbers to 10 using sets of objects and pictures, number names, and numerals.</p> <p>MA.3.A.6.Su.b Use one-to-one correspondence to count sets of objects to 10.</p> <p>MA.3.A.6.Su.c Compare and order numbers to 10 using sets of objects and pictures.</p>	<p>MA.3.A.6.Pa.a Communicate the desire for two or more preferred items or activities in familiar routines.</p> <p>MA.3.A.6.Pa.b Match two or more objects to designated spaces to show one-to-one correspondence.</p> <p>MA.3.A.6.Pa.c Respond to a prompt to indicate one object in familiar routines.</p> <p>MA.3.A.6.Pa.d Given a model, imitate counting two or more objects or actions.</p>

SUPPORTING IDEAS

Data Analysis

BENCHMARK CODE	BENCHMARK	
MA.3.S.7.1	Construct and analyze frequency tables, bar graphs, pictographs, and line plots from data, including data collected through observations, surveys, and experiments.	
Access Points for Students with Significant Cognitive Disabilities		
<p><i>Independent:</i></p> <p>MA.3.S.7.In.a Sort and count objects and pictures into three designated (labeled) categories and display data in an object graph or pictograph.</p>	<p><i>Supported:</i></p> <p>MA.3.S.7.Su.a Sort objects representing data into two designated (labeled) categories and count the number in each category.</p>	<p><i>Participatory:</i></p> <p>MA.3.S.7.Pa.a Identify items that belong together to complete a data set.</p> <p>MA.3.S.7.Pa.b Indicate preferred choice using objects, pictures, or symbols to create an object graph or pictograph.</p>

Grade 4

Benchmark Coding Scheme

MA.	4.	A.	1.	1
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Benchmark

Body of Knowledge Key:

A ~ Algebra

C ~ Calculus

D ~ Discrete Mathematics

F ~ Financial Literacy

G ~ Geometry

P ~ Probability

S ~ Statistics

T ~ Trigonometry

Access Points Coding Scheme

MA.	4.	A.	1.	In.a
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Access Point

Access Points Key:

In ~ Independent

Su ~ Supported

Pa ~ Participatory

K-8 MATHEMATICS STANDARDS

GRADE 4

BIG IDEA 1: *Develop quick recall of multiplication facts and related division facts and fluency with whole number multiplication.*

BENCHMARK CODE	BENCHMARK
MA.4.A.1.1	Use and describe various models for multiplication in problem-solving situations, and demonstrate recall of basic multiplication and related division facts with ease.
MA.4.A.1.2	Multiply multi-digit whole numbers through four digits fluently, demonstrating understanding of the standard algorithm, and checking for reasonableness of results, including solving real-world problems.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.4.A.1.In.a Solve problems involving combining (multiplying) or separating into (dividing) equal sets with quantities to 30 using objects and pictures with numerals.</p> <p>MA.4.A.1.In.b Recall addition facts with sums to 18 and related subtraction facts.</p> <p>MA.4.A.1.In.c Solve real-world addition and subtraction problems with two-digit numbers to 30 without regrouping, and check for accuracy.</p> <p>MA.4.A.1.In.d Use properties such as the commutative and additive identity as strategies to solve addition problems.</p>	<p>MA.4.A.1.Su.a Identify the meaning of the +, -, and = signs.</p> <p>MA.4.A.1.Su.b Solve addition facts with sums to 12 and related subtraction facts using numerals with sets of pictures and the +, -, and = signs.</p> <p>MA.4.A.1.Su.c Solve real-world problems involving addition facts with sums to 12 and related subtraction facts.</p>	<p>MA.4.A.1.Pa.a Recognize when items have been added to and removed from groups of objects in daily activities.</p> <p>MA.4.A.1.Pa.b Continue in a familiar routine with the addition or removal of a familiar person, action, or object in three or more settings.</p>

BIG IDEA 2: Develop an understanding of decimals, including the connection between fractions and decimals.

BENCHMARK CODE	BENCHMARK
MA.4.A.2.1	Use decimals through the thousandths place to name numbers between whole numbers.
MA.4.A.2.2	Describe decimals as an extension of the base-ten number system.
MA.4.A.2.3	Relate equivalent fractions and decimals with and without models, including locations on a number line.
MA.4.A.2.4	Compare and order decimals, and estimate fraction and decimal amounts in real-world problems.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.4.A.2.In.a Apply the concepts of counting, grouping, and place value with whole numbers to create sets of tens and ones to identify the value of whole numbers to 50.</p> <p>MA.4.A.2.In.b Identify differences between halves, fourths, and a whole.</p> <p>MA.4.A.2.In.c Express and represent fractions, including halves and fourths, as parts of a whole and parts of a set using objects, pictures, and number names.</p>	<p>MA.4.A.2.Su.a Apply the concept of grouping to create sets of tens and ones to 18 as a strategy for counting objects.</p> <p>MA.4.A.2.Su.b Identify half as a part of a whole.</p>	<p>MA.4.A.2.Pa.a Communicate desire for more in one routine or familiar activity.</p> <p>MA.4.A.2.Pa.b Communicate desire for none in a routine or familiar activity.</p> <p>MA.4.A.2.Pa.c Indicate desire for less in routines.</p> <p>MA.4.A.2.Pa.d Imitate counting two or more objects or actions in multiple activities.</p> <p>MA.4.A.2.Pa.e Match one object to a like object or picture using one-to-one correspondence.</p>

BIG IDEA 3: Develop an understanding of area and determine the area of two-dimensional shapes.

BENCHMARK CODE	BENCHMARK
MA.4.G.3.1	Describe and determine area as the number of same-sized units that cover a region in the plane, recognizing that a unit square is the standard unit for measuring area.
MA.4.G.3.2	Justify the formula for the area of the rectangle “area = base x height.”
MA.4.G.3.3	Select and use appropriate units, both customary and metric, strategies, and measuring tools to estimate and solve real-world area problems.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.4.G.3.In.a Identify examples of the distance around all sides (perimeter) and area of squares and rectangles in the environment.</p> <p>MA.4.G.3.In.b Find the area of rectangular and square objects using square units.</p> <p>MA.4.G.3.In.c Measure whole inches and feet using a ruler to solve real-world linear measurement problems.</p> <p>MA.4.G.3.In.d Identify time to the quarter hour using a clock.</p> <p>MA.4.G.3.In.e Identify the date and month using a calendar.</p> <p>MA.4.G.3.In.f Measure weight using whole pounds and capacity using whole cups to solve real-world problems.</p>	<p>MA.4.G.3.Su.a Identify examples of area in the environment.</p> <p>MA.4.G.3.Su.b Measure length of objects using whole inches.</p> <p>MA.4.G.3.Su.c Identify the capacity of containers as holds more or holds less.</p> <p>MA.4.G.3.Su.d Identify a clock as a tool to tell time.</p> <p>MA.4.G.3.Su.e Identify months using a calendar.</p>	<p>MA.4.G.3.Pa.a Identify similarities in the size of two or more familiar objects in daily activities.</p> <p>MA.4.G.3.Pa.b Identify similarities in shape of familiar objects in daily activities.</p> <p>MA.4.G.3.Pa.c Follow two or more directional instructions in routines or activities.</p> <p>MA.4.G.3.Pa.d Indicate two or more locations of preferred objects or activities within the learning environment.</p>

SUPPORTING IDEAS

Algebra

BENCHMARK CODE	BENCHMARK
MA.4.A.4.1	Generate algebraic rules and use all four operations to describe patterns, including nonnumeric growing or repeating patterns.
MA.4.A.4.2	Describe mathematics relationships using expressions, equations, and visual representations.
MA.4.A.4.3	Recognize and write algebraic expressions for functions with two operations.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.4.A.4.In.a Identify and extend growing visual and number patterns.</p> <p>MA.4.A.4.In.b Describe equal and unequal sets using terms including greater than, less than, and equal to.</p> <p>MA.4.A.4.In.c Identify the rule, including 1 less, 2 less, and 3 less, represented in number pairs.</p>	<p>MA.4.A.4.Su.a Identify and copy two-element repeating visual patterns using objects and pictures.</p> <p>MA.4.A.4.Su.b Determine if the number in two sets of objects to 10 are same or different (equal or unequal).</p> <p>MA.4.A.4.Su.c Use the rule 1 more to identify the next number with numbers 1 to 20.</p>	<p>MA.4.A.4.Pa.a Identify items that belong together to complete a set in routines or activities.</p> <p>MA.4.A.4.Pa.b Follow a two-element repeating pattern in two or more routines, activities, or settings.</p> <p>MA.4.A.4.Pa.c Indicate the next step in a familiar sequence of an activity.</p> <p>MA.4.A.4.Pa.d Indicate the end of a familiar sequence of an activity.</p>

SUPPORTING IDEAS

Geometry and Measurement

BENCHMARK CODE	BENCHMARK
MA.4.G.5.1	Classify angles of two-dimensional shapes using benchmark angles (i.e. 45°, 90°, 180°, and 360°).
MA.4.G.5.2	Identify and describe the results of translations, reflections, and rotations of 45, 90, 180, 270, and 360 degrees, including figures with line and rotational symmetry.
MA.4.G.5.3	Identify and build a three-dimensional object from a two-dimensional representation of that object and vice versa.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.4.G.5.In.a Locate angles in two-dimensional shapes including triangles and rectangles.</p> <p>MA.4.G.5.In.b Identify examples of two-dimensional figures that are the same shape and size (congruency) and figures that are visually the same on both sides of a central dividing line (symmetry) in the environment.</p> <p>MA.4.G.5.In.c Sort three-dimensional objects, such as cubes, cylinders, cones, rectangular prisms, and spheres.</p>	<p>MA.4.G.5.Su.a Locate angles within a triangle.</p> <p>MA.4.G.5.Su.b Identify two-dimensional figures that are visually the same on both sides of a central dividing line (symmetry).</p> <p>MA.4.G.5.Su.c Match three-dimensional objects with models, such as a cube, cylinder, cone, and sphere.</p>	<p>MA.4.G.5.Pa.a Identify differences in familiar objects with two-dimensional shapes, such as circle, square, or triangle.</p> <p>MA.4.G.5.Pa.b Identify two or more familiar three-dimensional objects in daily activities.</p> <p>MA.4.G.5.Pa.c Identify objects, pictures, or symbols associated with two or more activities in the daily schedule.</p>

SUPPORTING IDEAS

Number and Operations

BENCHMARK CODE	BENCHMARK
MA.4.A.6.1	Use and represent numbers through millions in various contexts, including estimation of relative sizes of amounts or distances.
MA.4.A.6.2	Use models to represent division as: <ul style="list-style-type: none"> • the inverse of multiplication • as partitioning • as successive subtraction
MA.4.A.6.3	Generate equivalent fractions and simplify fractions.
MA.4.A.6.4	Determine factors and multiples for specified whole numbers.
MA.4.A.6.5	Relate halves, fourths, tenths, and hundredths to decimals and percents.
MA.4.A.6.6	Estimate and describe reasonableness of estimates; determine the appropriateness of an estimate versus an exact answer.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.4.A.6.In.a Express, represent, and use whole numbers 0 to 50 in various contexts, including money.</p> <p>MA.4.A.6.In.b Compare and order whole numbers to 50 using pictures or tallies and a number line.</p> <p>MA.4.A.6.In.c Use the inverse relationship of addition and subtraction as a strategy to solve problems.</p> <p>MA.4.A.6.In.d Use skip counting by 5s and 10s to determine amounts to 50.</p> <p>MA.4.A.6.In.e Use strategies such as comparing and grouping to estimate quantities to 10.</p>	<p>MA.4.A.6.Su.a Express, represent, and use whole numbers to 18 using sets of objects and pictures, number names, and numerals in various contexts, including money.</p> <p>MA.4.A.6.Su.b Count, compare, and order numbers 0 to 18 using sets of objects and pictures with numerals.</p> <p>MA.4.A.6.Su.c Use objects and pictures to represent the relationship between addition and subtraction facts.</p> <p>MA.4.A.6.Su.d Use ordinal numbers, including first and second, in real-world situations.</p>	<p>MA.4.A.6.Pa.a Respond to a prompt to identify a specified part of an object.</p> <p>MA.4.A.6.Pa.b Solve problems by selecting a preferred or necessary item from two or more options in a routine.</p>

Grade 5

Benchmark Coding Scheme

MA.	5.	A.	1.	1
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Benchmark

Body of Knowledge Key:

- A ~ Algebra
- C ~ Calculus
- D ~ Discrete Mathematics
- F ~ Financial Literacy
- G ~ Geometry
- P ~ Probability
- S ~ Statistics
- T ~ Trigonometry

Access Points Coding Scheme

MA.	5.	A.	1.	In.a
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Access Point

Access Points Key:

- In ~ Independent
- Su ~ Supported
- Pa ~ Participatory

K-8 MATHEMATICS STANDARDS

GRADE 5

BIG IDEA 1: *Develop an understanding of and fluency with division of whole numbers.*

BENCHMARK CODE	BENCHMARK
MA.5.A.1.1	Describe the process of finding quotients involving multi-digit dividends using models, place value, properties and the relationship of division to multiplication.
MA.5.A.1.2	Estimate quotients or calculate them mentally depending on the context and numbers involved.
MA.5.A.1.3	Interpret solutions to division situations including those with remainders depending on the context of the problem.
MA.5.A.1.4	Divide multi-digit whole numbers fluently, including solving real-world problems, demonstrating understanding of the standard algorithm and checking the reasonableness of results.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.5.A.1.In.a Use a grouping strategy to separate (divide) quantities to 50 into equal sets using objects, coins, and pictures with numerals.</p> <p>MA.5.A.1.In.b Solve problems that involve multiplying equal sets with quantities to 50 using objects and pictures with numerals.</p>	<p>MA.5.A.1.Su.a Use counting and grouping to separate (divide) quantities to 18 into equal sets using objects and pictures with numerals.</p> <p>MA.5.A.1.Su.b Solve problems that involve combining (multiplying) equal sets with quantities to 18 using objects and pictures with numerals.</p>	<p>MA.5.A.1.Pa.a Recognize when items have been added to or removed from groups of objects in activities in two or more settings.</p> <p>MA.5.A.1.Pa.b Continue in a familiar routine with the addition or removal of an unfamiliar person, action, or object in two or more settings.</p>

BIG IDEA 2: Develop an understanding of and fluency with addition and subtraction of fractions and decimals.

BENCHMARK CODE	BENCHMARK
MA.5.A.2.1	Represent addition and subtraction of decimals and fractions with like and unlike denominators using models, place value or properties.
MA.5.A.2.2	Add and subtract fractions and decimals fluently and verify the reasonableness of results, including in problem situations.
MA.5.A.2.3	Make reasonable estimates of fraction and decimal sums and differences, and use techniques for rounding.
MA.5.A.2.4	Determine the prime factorization of numbers.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.5.A.2.In.a Express, represent, and use fractions including halves, fourths, and thirds, as parts of a whole and as parts of a set, using number names.</p> <p>MA.5.A.2.In.b Compare fractional parts of objects of equal size, including halves, fourths, and thirds.</p> <p>MA.5.A.2.In.c Use the associative property as a strategy to solve addition problems with three or more numbers.</p>	<p>MA.5.A.2.Su.a Identify the relationship between half and whole.</p> <p>MA.5.A.2.Su.b Use the commutative property as a strategy to check the accuracy of solutions to addition problems.</p>	<p>MA.5.A.2.Pa.a Communicate desire for more in two or more routines or familiar activities.</p> <p>MA.5.A.2.Pa.b Communicate desire for none in two or more routines or familiar activities.</p> <p>MA.5.A.2.Pa.c Communicate desire for less in a routine or familiar activity.</p> <p>MA.5.A.2.Pa.d Respond to a prompt to identify a specified part of a whole.</p>

BIG IDEA 3: Describe three-dimensional shapes and analyze their properties, including volume and surface area.

BENCHMARK CODE	BENCHMARK
MA.5.G.3.1	Analyze and compare the properties of two-dimensional figures and three-dimensional solids (polyhedra), including the number of edges, faces, vertices, and types of faces.
MA.5.G.3.2	Describe, define and determine surface area and volume of prisms by using appropriate units and selecting strategies and tools.

Access Points for Students with Significant Cognitive Disabilities

Independent:	Supported:	Participatory:
<p>MA.5.G.3.In.a Identify attributes, including curves, edges, angles, and faces, of three-dimensional objects in the environment.</p> <p>MA.5.G.3.In.b Match two-dimensional shapes with three-dimensional solids, including circle with sphere, square with cube, and triangle with cone.</p> <p>MA.5.G.3.In.c Use US customary units of measurement to measure length of sides of squares, rectangles, and triangles; and add them together to find the perimeter.</p> <p>MA.5.G.3.In.d Find the area of rectangular and square shapes using a visual model, such as a grid.</p>	<p>MA.5.G.3.Su.a Identify attributes, including number of sides, curved or straight sides, and number of corners (angles), in two-dimensional shapes.</p> <p>MA.5.G.3.Su.b Sort three-dimensional objects, including cube, cone, and sphere.</p> <p>MA.5.G.3.Su.c Identify examples of the distance around all sides (perimeter) of squares and rectangles.</p> <p>MA.5.G.3.Su.d Compare the size of two square areas in the environment using physical models.</p>	<p>MA.5.G.3.Pa.a Identify differences in features, such as shape and size of objects, in two or more familiar activities.</p> <p>MA.5.G.3.Pa.b Follow two or more directional instructions in activities.</p> <p>MA.5.G.3.Pa.c Locate familiar three-dimensional objects in daily activities.</p> <p>MA.5.G.3.Pa.d Match an object, picture, or symbol with an identical object, picture, or symbol.</p>

SUPPORTING IDEAS

Algebra

BENCHMARK CODE	BENCHMARK
MA.5.A.4.1	Use the properties of equality to solve numerical and real world situations.
MA.5.A.4.2	Construct and describe a graph showing continuous data, such as a graph of a quantity that changes over time.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.5.A.4.In.a Use the concept of equality as a strategy to solve problems.</p> <p>MA.5.A.4.In.b Describe the meaning of information in a pictograph or bar graph that shows change over time.</p>	<p>MA.5.A.4.Su.a Identify and compare the relationship between two same or different (equal or unequal) sets to 18 using physical and visual models.</p> <p>MA.5.A.4.Su.b Identify information displayed on an object graph or pictograph.</p>	<p>MA.5.A.4.Pa.a Identify items that belong together to complete two or more sets in routines or activities.</p> <p>MA.5.A.4.Pa.b Identify differences in features of objects and actions in familiar activities.</p> <p>MA.5.A.4.Pa.c Match a repeating pattern with two elements in a familiar routine or activity.</p> <p>MA.5.A.4.Pa.d Indicate the next step in a sequence for an activity.</p> <p>MA.5.A.4.Pa.e Indicate the end of two regularly occurring activities.</p>

SUPPORTING IDEAS

Geometry and Measurement

BENCHMARK CODE	BENCHMARK
MA.5.G.5.1	Identify and plot ordered pairs on the first quadrant of the coordinate plane.
MA.5.G.5.2	Compare, contrast, and convert units of measure within the same dimension (length, mass, or time) to solve problems.
MA.5.G.5.3	Solve problems requiring attention to approximation, selection of appropriate measuring tools, and precision of measurement.
MA.5.G.5.4	Derive and apply formulas for areas of parallelograms, triangles, and trapezoids from the area of a rectangle.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.5.G.5.In.a Indicate the relative position, before or after, of whole numbers on a 0-50 number line.</p> <p>MA.5.G.5.In.b Solve real-world problems involving length, weight, and capacity of objects using tools with standard units.</p> <p>MA.5.G.5.In.c Identify time to the minute.</p>	<p>MA.5.G.5.Su.a Indicate the relative position, before or after, of whole numbers on a 1-10 number line.</p> <p>MA.5.G.5.Su.b Solve real-world problems by comparing the measurement including length, weight, and capacity of objects.</p> <p>MA.5.G.5.Su.c Identify time to the hour and half-hour.</p>	<p>MA.5.G.5.Pa.a Identify differences in large and small objects in daily activities.</p> <p>MA.5.G.5.Pa.b Indicate the next regularly occurring activity in the daily schedule sequence.</p>

SUPPORTING IDEAS

Number and Operations

BENCHMARK CODE	BENCHMARK
MA.5.A.6.1	Identify and relate prime and composite numbers, factors and multiples within the context of fractions.
MA.5.A.6.2	Use the order of operations to simplify expressions which include exponents and parentheses.
MA.5.A.6.3	Describe real-world situations using positive and negative numbers.
MA.5.A.6.4	Compare, order, and graph integers, including integers shown on a number line.
MA.5.A.6.5	Solve non-routine problems using various strategies including “solving a simpler problem” and “guess, check, and revise.”

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.5.A.6.In.a Use skip counting to identify multiples of 2, 5, and 10 for numbers to 100.</p> <p>MA.5.A.6.In.b Identify place value of two-digit numbers to 99 in terms of tens and ones.</p> <p>MA.5.A.6.In.c Express, represent, and use whole numbers to 100 in various contexts, including time, money, and measurement.</p> <p>MA.5.A.6.In.d Solve real-world addition and subtraction problems with one-digit numbers by estimating and checking for accuracy.</p> <p>MA.5.A.6.In.e Solve for an unknown number in addition and subtraction number sentences with numbers to 18.</p> <p>MA.5.A.6.In.f Demonstrate basic calculator skills for addition and subtraction of whole numbers.</p> <p>MA.5.A.6.In.g Select the operation and solve one-step problems involving addition or subtraction of two-digit numbers without regrouping and check for accuracy.</p>	<p>MA.5.A.6.Su.a Use skip counting by 5s to 30.</p> <p>MA.5.A.6.Su.b Apply the concepts of counting and grouping to identify the value of whole numbers to 30.</p> <p>MA.5.A.6.Su.c Express, represent, and use cardinal numbers to 30 and ordinal numbers to fifth in various contexts, including time and money.</p> <p>MA.5.A.6.Su.d Compare and order whole numbers to 30 using objects, pictures, number names, and numerals.</p> <p>MA.5.A.6.Su.e Solve real-world problems involving addition facts with sums to 18 and related subtraction facts using numerals with pictures.</p>	<p>MA.5.A.6.Pa.a Indicate 1 and 1 more by imitating a model.</p> <p>MA.5.A.6.Pa.b Match an object, picture, or symbol to an identical object, picture, or symbol in routines using one-to-one correspondence.</p> <p>MA.5.A.6.Pa.c Imitate counting objects or actions to 3 or more given a model.</p> <p>MA.5.A.6.Pa.d Respond to a prompt to exchange a predetermined amount of money for a preferred object.</p> <p>MA.5.A.6.Pa.e Solve problems by selecting preferred or necessary item from options in two or more routines.</p>

SUPPORTING IDEAS

Data Analysis

BENCHMARK CODE	BENCHMARK	
MA.5.S.7.1	Construct and analyze line graphs and double bar graphs.	
MA.5.S.7.2	Differentiate between continuous and discrete data and determine ways to represent those using graphs and diagrams.	
Access Points for Students with Significant Cognitive Disabilities		
<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.5.S.7.In.a Sort and count data into three designated (labeled) categories, and display data on a pictograph or bar graph.</p> <p>MA.5.S.7.In.b Interpret the meaning of data in a three-category pictograph or bar graph.</p>	<p>MA.5.S.7.Su.a Sort and count objects or pictures into two designated (labeled) categories and display data in an object graph or pictograph.</p> <p>MA.5.S.7.Su.b Identify the meaning of data in a two-category object graph or pictograph.</p>	<p>MA.5.S.7.Pa.a Imitate counting up to three familiar objects, pictures, or symbols in data sets.</p>

Grade 6

MA.	6.	A.	1.	1
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Benchmark

Body of Knowledge Key:

A ~ Algebra

C ~ Calculus

D ~ Discrete Mathematics

F ~ Financial Literacy

G ~ Geometry

P ~ Probability

S ~ Statistics

T ~ Trigonometry

Access Points Coding Scheme

MA.	6.	A.	1.	In.a
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Access Point

Access Points Key:

In ~ Independent

Su ~ Supported

Pa ~ Participatory

K-8 MATHEMATICS STANDARDS

GRADE 6

BIG IDEA 1: *Develop an understanding of and fluency with multiplication and division of fractions and decimals.*

BENCHMARK CODE	BENCHMARK
MA.6.A.1.1	Explain and justify procedures for multiplying and dividing fractions and decimals.
MA.6.A.1.2	Multiply and divide fractions and decimals efficiently.
MA.6.A.1.3	Solve real-world problems involving multiplication and division of fractions and decimals.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.6.A.1.In.a Express and represent fractions, including halves, fourths, thirds, and eighths, using number names and numerals.</p> <p>MA.6.A.1.In.b Solve real-world problems involving fractions, including halves, fourths, thirds, and eighths.</p> <p>MA.6.A.1.In.c Identify multiplication as repeated addition of equal groups and multiply one-digit numbers using physical and visual models with numerals.</p> <p>MA.6.A.1.In.d Identify division as repeated subtraction of equal groups and divide one-digit numbers using physical and visual models with numerals.</p>	<p>MA.6.A.1.Su.a Identify fractions as part of a whole or part of a set.</p> <p>MA.6.A.1.Su.b Use fractions, including halves, to solve real-world problems.</p> <p>MA.6.A.1.Su.c Use skip counting by 5s and 10s to 50.</p> <p>MA.6.A.1.Su.d Solve problems that involve combining (multiplying) equal sets with quantities to 30 using objects and pictures with numerals.</p> <p>MA.6.A.1.Su.e Use counting and grouping to separate (divide) quantities to 30 into sets with the same number using objects or pictures.</p>	<p>MA.6.A.1.Pa.a Identify a specified part of a whole.</p> <p>MA.6.A.1.Pa.b Communicate desire for familiar items to be added or removed in daily activities.</p> <p>MA.6.A.1.Pa.c Communicate desire for more and none in two or more daily activities in different parts of the learning environment.</p> <p>MA.6.A.1.Pa.d Communicate desire for less in two or more routines or familiar activities.</p>

BIG IDEA 2: *Connect ratio and rates to multiplication and division.*

BENCHMARK CODE	BENCHMARK	
MA.6.A.2.1	Use reasoning about multiplication and division to solve ratio and rate problems.	
MA.6.A.2.2	Interpret and compare ratios and rates.	
Access Points for Students with Significant Cognitive Disabilities		
<p><i>Independent:</i></p> <p>MA.6.A.2.In.a Describe the relationship (ratio) between two sets of data.</p> <p>MA.6.A.2.In.b Identify two meanings of rate: a measure of speed, including miles per hour and words per minute; and a measure of cost, including price per gallon and cost per pound.</p>	<p><i>Supported:</i></p> <p>MA.6.A.2.Su.a Identify the relationship between sets of paired numbers.</p> <p>MA.6.A.2.Su.b Identify the meaning of rate (how fast something moves or happens).</p>	<p><i>Participatory:</i></p> <p>MA.6.A.2.Pa.a Identify differences in number of objects in daily activities.</p> <p>MA.6.A.2.Pa.b Identify similarities in number of objects in daily activities.</p> <p>MA.6.A.2.Pa.c Indicate awareness of changes in rates of movement (fast and slow).</p>

BIG IDEA 3: Write, interpret, and use mathematical expressions and equations.

BENCHMARK CODE	BENCHMARK
MA.6.A.3.1	Write and evaluate mathematical expressions that correspond to given situations.
MA.6.A.3.2	Write, solve, and graph one- and two- step linear equations and inequalities.
MA.6.A.3.3	Works backward with two-step function rules to undo expressions.
MA.6.A.3.4	Solve problems given a formula.
MA.6.A.3.5	Apply the Commutative, Associative, and Distributive Properties to show that two expressions are equivalent.
MA.6.A.3.6	Construct and analyze tables, graphs and equations to describe linear functions and other simple relations using both common language and algebraic notation.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.6.A.3.In.a Write and solve number sentences (equations) that correspond to real-world problem situations involving addition and subtraction with two-digit numbers.</p> <p>MA.6.A.3.In.b Use models and diagrams to solve problems with inequalities, including the $>$ and $<$ signs.</p> <p>MA.6.A.3.In.c Identify rules that use addition and subtraction for functions represented in number pairs.</p> <p>MA.6.A.3.In.d Use the commutative and associative properties of addition to show that two number sentences (equations) are equal.</p> <p>MA.6.A.3.In.e Solve addition and subtraction number sentences (equations) using information from physical models, diagrams, and tables.</p> <p>MA.6.A.3.In.f Use visual models, such as tables, to show the relationship between addition and subtraction problems.</p>	<p>MA.6.A.3.Su.a Write and solve number sentences (equations) that correspond to real-world problem situations involving addition and subtraction with one-digit numbers.</p> <p>MA.6.A.3.Su.b Use physical models and diagrams to solve problems with inequalities, including the terms more than and less than.</p> <p>MA.6.A.3.Su.c Use the commutative property of addition to show that two number sentences represented by physical and visual models are equal.</p> <p>MA.6.A.3.Su.d Use visual models, such as two-column tables, to represent the relationship of addition and subtraction basic facts.</p> <p>MA.6.A.3.Su.e Use information from physical models, diagrams, tables, and pictographs to solve number sentences (equations) involving addition and subtraction with one-digit numbers.</p>	<p>MA.6.A.3.Pa.a Follow a prompt to identify a missing item from a familiar set.</p> <p>MA.6.A.3.Pa.b Indicate the next step in a sequence for two or more activities.</p> <p>MA.6.A.3.Pa.c Match a repeating pattern with two elements in two or more routines or activities.</p> <p>MA.6.A.3.Pa.d Indicate 1 and 1 more by imitating a model in more than one activity.</p>

SUPPORTING IDEAS

Geometry and Measurement

BENCHMARK CODE	BENCHMARK
MA.6.G.4.1	Understand the concept of π , know common estimates of π (3.14; 22/7) and use these values to estimate and calculate the circumference and the area of circles.
MA.6.G.4.2	Find the perimeters and areas of composite two-dimensional figures, including non-rectangular figures (such as semicircles) using various strategies.
MA.6.G.4.3	Determine a missing dimension of a plane figure or prism, given its area or volume and some of the dimensions, or determine the area or volume given the dimensions.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.6.G.4.In.a Compare the distance around the outside of circles (circumference) using physical or visual models.</p> <p>MA.6.G.4.In.b Measure the distance around all sides (perimeter) of polygons, such as squares, triangles, rectangles, and hexagons.</p> <p>MA.6.G.4.In.c Compare areas of circles using visual models.</p> <p>MA.6.G.4.In.d Measure capacity using cups, pints, quarts, and gallons.</p>	<p>MA.6.G.4.Su.a Identify the distance around the outside of circles (circumference).</p> <p>MA.6.G.4.Su.b Measure the lengths of sides of rectangles and triangles.</p> <p>MA.6.G.4.Su.c Compare the areas of rectangular and square shapes using physical models.</p> <p>MA.6.G.4.Su.d Compare areas of circles using physical models.</p> <p>MA.6.G.4.Su.e Measure capacity using cups.</p>	<p>MA.6.G.4.Pa.a Place familiar objects in designated locations in routines.</p> <p>MA.6.G.4.Pa.b Follow three or more directional instructions in daily activities.</p> <p>MA.6.G.4.Pa.c Identify differences in objects with two-dimensional shapes, such as circle, square, or triangle.</p> <p>MA.6.G.4.Pa.d Indicate the next regularly occurring activity in the daily schedule.</p>

SUPPORTING IDEAS

Number and Operations

BENCHMARK CODE	BENCHMARK
MA.6.A.5.1	Use equivalent forms of fractions, decimals, and percents to solve problems.
MA.6.A.5.2	Compare and order fractions, decimals, and percents, including finding their approximate location on a number line.
MA.6.A.5.3	Estimate the results of computations with fractions, decimals, and percents and judge the reasonableness of the results.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.6.A.5.In.a Compare fractional parts of the same size objects or sets, including halves, fourths, thirds, and eighths.</p> <p>MA.6.A.5.In.b Identify the value of money to \$1.00 expressed as a decimal Examples: \$.75 is 75 cents. \$.60 is 60 cents.</p> <p>MA.6.A.5.In.c Express, represent, and use whole numbers to 200 in various contexts, including time, money, and measurement.</p> <p>MA.6.A.5.In.d Use a grouping strategy or place value to round to the nearest ten to determine a reasonable estimate in problem situations involving whole numbers to 100, and check for accuracy.</p> <p>MA.6.A.5.In.e Solve problems involving the addition and subtraction of two-digit whole numbers with regrouping using physical and visual models.</p> <p>MA.6.A.5.In.f Solve two-step real-world problems involving addition and subtraction of two-digit numbers and check for accuracy using the reverse operation.</p>	<p>MA.6.A.5.Su.a Express, represent, and use whole numbers to 50 using objects, pictures, number names, and numerals, in various contexts including time and money.</p> <p>MA.6.A.5.Su.b Compare and order whole numbers to 50 using objects, pictures, number names, and numerals.</p> <p>MA.6.A.5.Su.c Apply the concepts of counting and grouping to identify the value of whole numbers to 50.</p> <p>MA.6.A.5.Su.d Use basic calculator skills to enter basic addition and subtraction facts with one-digit numbers to obtain the solution to problems.</p>	<p>MA.6.A.5.Pa.a Match two or more objects to identical objects in routines using one-to-one correspondence.</p> <p>MA.6.A.5.Pa.b Imitate counting objects or actions to 2 or more in multiple activities.</p> <p>MA.6.A.5.Pa.c Respond to a gesture or imitate a model to exchange a predetermined amount of money for a preferred item.</p> <p>MA.6.A.5.Pa.d Solve problems by selecting preferred or necessary item given two or more options in different routines in multiple settings.</p>

SUPPORTING IDEAS

Data Analysis

BENCHMARK CODE	BENCHMARK
MA.6.S.6.1	Determine the measures of central tendency (mean, median, and mode) and variability (range) for a given set of data.
MA.6.S.6.2	Select and analyze the measures of central tendency or variability to represent, describe, analyze and/or summarize a data set for the purposes of answering questions appropriately.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.6.S.6.In.a Use a bar graph to group and display data in categories.</p> <p>MA.6.S.6.In.b Identify the categories with the largest and smallest numbers represented on a bar graph.</p>	<p>MA.6.S.6.Su.a Sort and count data using three designated (labeled) categories and display in a pictograph.</p> <p>MA.6.S.6.Su.b Identify the category with the largest number in a pictograph representing real-world situations.</p>	<p>MA.6.S.6.Pa.a Identify familiar objects, pictures, or symbols used to represent data in a pictograph or chart.</p> <p>MA.6.S.6.Pa.b Identify the largest set of objects, pictures, or symbols representing data up to 3.</p>

Grade 7

MA.	7.	A.	1.	1
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Benchmark

Body of Knowledge Key:

A ~ Algebra

C ~ Calculus

D ~ Discrete Mathematics

F ~ Financial Literacy

G ~ Geometry

P ~ Probability

S ~ Statistics

T ~ Trigonometry

Access Points Coding Scheme

MA.	7.	A.	1.	In.a
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Access Point

Access Points Key:

In ~ Independent

Su ~ Supported

Pa ~ Participatory

K-8 MATHEMATICS STANDARDS

GRADE 7

BIG IDEA 1: *Develop an understanding of and apply proportionality, including similarity.*

BENCHMARK CODE	BENCHMARK
MA.7.A.1.1	Distinguish between situations that are proportional or not proportional and use proportions to solve problems.
MA.7.A.1.2	Solve percent problems, including problems involving discounts, simple interest, taxes, tips and percents of increase or decrease.
MA.7.A.1.3	Solve problems involving similar figures.
MA.7.A.1.4	Graph proportional relationships and identify the unit rate as the slope of the related linear function.
MA.7.A.1.5	Distinguish direct variation from other relationships, including inverse variation.
MA.7.A.1.6	Apply proportionality to measurement in multiple contexts, including scale drawings and constant speed.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.7.A.1.In.a Use ratio to solve real-world problems using physical models, graphic representations, and charts.</p> <p>MA.7.A.1.In.b Identify that a higher percent represents a larger quantity or amount in real-world problems.</p> <p>MA.7.A.1.In.c Describe how models compare in size to real-life objects.</p>	<p>MA.7.A.1.Su.a Use simple ratios to solve real-world problems using objects.</p> <p>MA.7.A.1.Su.b Identify that percent discounts reduce the price of goods in real-world situations.</p> <p>MA.7.A.1.Su.c Compare the size of models to real-life objects using terms such as same, larger, and smaller.</p>	<p>MA.7.A.1.Pa.a Select large or small version of the same object in daily activities.</p> <p>MA.7.A.1.Pa.b Match two different objects, pictures, or symbols presented at the same time to identical objects, pictures, or symbols using the concept of one-to-one correspondence.</p>

BIG IDEA 2: *Develop an understanding of and use formulas to determine surface areas and volumes of three-dimensional shapes.*

BENCHMARK CODE	BENCHMARK
MA.7.G.2.1	Justify and apply formulas for surface area and volume of pyramids, prisms, cylinders, and cones.
MA.7.G.2.2	Use formulas to find surface areas and volume of three-dimensional composite shapes.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.7.G.2.In.a Identify the six faces of a three-dimensional rectangular prism or cube.</p> <p>MA.7.G.2.In.b Use stated formulas to solve for perimeter and area of rectangles.</p> <p>MA.7.G.2.In.c Solve real-world problems involving capacity using standard units of measure including cups, pints, quarts, and gallon.</p>	<p>MA.7.G.2.Su.a Find the area of rectangular and square objects using square units.</p> <p>MA.7.G.2.Su.b Add lengths of sides of rectangles to determine the distance around (perimeter).</p> <p>MA.7.G.2.Su.c Match common two-dimensional shapes with three-dimensional solids, including circle with sphere, square with cube, and triangle with cone.</p> <p>MA.7.G.2.Su.d Use US customary units to measure cups and gallons.</p>	<p>MA.7.G.2.Pa.a Identify objects or pictures that are the same size in daily activities.</p> <p>MA.7.G.2.Pa.b Place familiar objects in two or more designated locations and areas in routines.</p>

BIG IDEA 3: *Develop an understanding of operations on all rational numbers and solving linear equations.*

BENCHMARK CODE	BENCHMARK
MA.7.A.3.1	Use and justify the rules for adding, subtracting, multiplying, dividing, and finding the absolute value of integers.
MA.7.A.3.2	Add, subtract, multiply, and divide integers, fractions, and terminating decimals, and perform exponential operations with rational bases and whole number exponents including solving problems in everyday contexts.
MA.7.A.3.3	Formulate and use different strategies to solve one-step and two-step linear equations, including equations with rational coefficients.
MA.7.A.3.4	Use the properties of equality to represent an equation in a different way and to show that two equations are equivalent in a given context.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.7.A.3.In.a Solve number sentences (equations) involving addition and subtraction of numbers to 500.</p> <p>MA.7.A.3.In.b Translate real-world problem situations into number sentences (equations) involving addition and subtraction of two-digit numbers using a problem solving strategy.</p> <p>MA.7.A.3.In.c Use physical and visual models to represent the inverse relationship between multiplication and division.</p> <p>MA.7.A.3.In.d Use the property of equality as a strategy to solve real-world problems.</p>	<p>MA.7.A.3.Su.a Add and subtract one-digit and two-digit number sentences (equations).</p> <p>MA.7.A.3.Su.b Write and solve number sentences (equations) that correspond to real-world problem situations involving addition and subtraction with one-digit and two-digit numbers.</p> <p>MA.7.A.3.Su.c Solve problems that involve combining (multiplying) equal sets with quantities to 50 using objects and pictures with numerals.</p> <p>MA.7.A.3.Su.d Use counting and grouping to separate (divide) quantities to 50 into sets with the same number using objects or pictures.</p> <p>MA.7.A.3.Su.e Use skip counting by 5s and 10s to 60.</p> <p>MA.7.A.3.Su.f Use physical models to solve simple problems to demonstrate the concept of equality.</p>	<p>MA.7.A.3.Pa.a Imitate a model of adding 1 more to quantities to 3 in a routine or activity.</p> <p>MA.7.A.3.Pa.b Imitate a model of taking 1 away from quantities to 3 in a routine or activity.</p> <p>MA.7.A.3.Pa.c Identify a missing item from two or more familiar sets given a model.</p> <p>MA.7.A.3.Pa.d Follow a repeating pattern with three or more elements in a familiar routine or activity.</p> <p>MA.7.A.3.Pa.e Indicate next steps in a sequence for a familiar routine or activity.</p>

SUPPORTING IDEAS

Geometry and Measurement

BENCHMARK CODE	BENCHMARK
MA.7.G.4.1	Determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and apply these relationships to solve problems.
MA.7.G.4.2	Predict the results of transformations and draw transformed figures, with and without the coordinate plane.
MA.7.G.4.3	Identify and plot ordered pairs in all four quadrants of the coordinate plane.
MA.7.G.4.4	Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)), dimensions, and derived units to solve problems.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.7.G.4.In.a Identify the effects of changes in the lengths of sides of rectangles on the perimeter and area using physical and visual models.</p> <p>MA.7.G.4.In.b Solve problems involving rate, including as a measure of speed and a measure of cost.</p> <p>MA.7.G.4.In.c Identify examples of slides (translations), turns (rotations), and flips (reflections) of geometric figures using pictures and objects.</p> <p>MA.7.G.4.In.d Compare angles to a model of a right angle to identify the angles as acute, obtuse, or right angles.</p> <p>MA.7.G.4.In.e Use tools such as charts and technology to convert measures of capacity including cups, pints, quarts, and gallons.</p>	<p>MA.7.G.4.Su.a Recognize that changes in the lengths of sides of rectangles will make the figure or object smaller or larger.</p> <p>MA.7.G.4.Su.b Identify examples of rate in real-world situations.</p> <p>MA.7.G.4.Su.c Match identical (congruent) geometric figures in different positions, including flips (reflections) and turns (rotations).</p> <p>MA.7.G.4.Su.d Identify angles in the environment.</p> <p>MA.7.G.4.Su.e Identify time to the quarter hour using a clock.</p> <p>MA.7.G.4.Su.f Identify the number of cups in a pint to convert measures of capacity.</p>	<p>MA.7.G.4.Pa.a Match a three-dimensional object to a like object with two options.</p> <p>MA.7.G.4.Pa.b Recognize fast and slow rates of movement in different settings.</p> <p>MA.7.G.4.Pa.c Indicate the next two regularly occurring activities in the daily schedule.</p> <p>MA.7.G.4.Pa.d Follow three or more directional instructions in daily activities.</p>

SUPPORTING IDEAS

Number and Operations

BENCHMARK CODE	BENCHMARK
MA.7.A.5.1	Express rational numbers as terminating or repeating decimals.
MA.7.A.5.2	Solve non-routine problems by working backwards.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.7.A.5.In.a Express, represent, and use whole numbers to 500 in various contexts, including time, money, and measurement.</p> <p>MA.7.A.5.In.b Express, represent, and use fractions, including halves, fourths, thirds, and eighths, using whole objects or sets, number names, and numerals in various contexts, including measurement.</p> <p>MA.7.A.5.In.c Express, represent, and use percents, including 50% and 100%, and decimals in the context of money to \$1.00 or more.</p> <p>MA.7.A.5.In.d Use a grouping strategy or place value to round whole numbers to 500 to the nearest ten or hundred to determine a reasonable estimate in problem situations, and check for accuracy.</p>	<p>MA.7.A.5.Su.a Express, represent, and use cardinal numbers to 80 and ordinal numbers to tenth in various contexts, including time and money.</p> <p>MA.7.A.5.Su.b Express and represent fractions, including halves and fourths, using whole objects or sets, number names, and numerals.</p> <p>MA.7.A.5.Su.c Identify the value of individual coins written as a decimal.</p> <p>MA.7.A.5.Su.d Apply the concepts of counting and grouping to create sets of tens and ones to identify the value of whole numbers to 80.</p>	<p>MA.7.A.5.Pa.a Communicate desire for more, none, and less in activities in the school setting.</p> <p>MA.7.A.5.Pa.b Identify a specified part of two or more objects.</p> <p>MA.7.A.5.Pa.c Count objects or actions to 3 or more.</p> <p>MA.7.A.5.Pa.d Respond to a gesture or imitate a model to exchange a predetermined amount of money for a preferred object.</p> <p>MA.7.A.5.Pa.e Solve problems by selecting the preferred or necessary item when given two or more options in activities in multiple settings.</p>

SUPPORTING IDEAS

Data Analysis

BENCHMARK CODE	BENCHMARK	
MA.7.S.6.1	Evaluate the reasonableness of a sample to determine the appropriateness of generalizations made about the population.	
MA.7.S.6.2	Construct and analyze histograms, stem-and-leaf plots, and circle graphs.	
Access Points for Students with Significant Cognitive Disabilities		
<p style="text-align: center; margin: 0;"><i>Independent:</i></p> <p>MA.7.S.6.In.a Use bar graphs to display data and describe the meaning of the data.</p> <p>MA.7.S.6.In.b Use data from a part of a group (sample) to make predictions regarding the whole group.</p>	<p style="text-align: center; margin: 0;"><i>Supported:</i></p> <p>MA.7.S.6.Su.a Use pictographs to display data in designated (labeled) categories and identify the number in each category.</p> <p>MA.7.S.6.Su.b Compare data shown in a pictograph with three categories and describe which categories have the largest, smallest, or the same amount.</p>	<p style="text-align: center; margin: 0;"><i>Participatory:</i></p> <p>MA.7.S.6.Pa.a Count the objects, pictures, or symbols used in a pictograph or chart and identify total to 3 or more.</p>

SUPPORTING IDEAS

Probability

BENCHMARK CODE	BENCHMARK	
MA.7.P.7.1	Determine the outcome of an experiment and predict which events are likely or unlikely, and if the experiment is fair or unfair.	
MA.7.P.7.2	Determine, compare, and make predictions based on experimental or theoretical probability of independent or dependent events.	
Access Points for Students with Significant Cognitive Disabilities		
<p style="text-align: center; margin: 0;"><i>Independent:</i></p> <p>MA.7.P.7.In.a Predict the likely outcome of a simple experiment and conduct the experiment to determine if prediction was correct.</p>	<p style="text-align: center; margin: 0;"><i>Supported:</i></p> <p>MA.7.P.7.Su.a Predict the likely outcome of a simple experiment by selecting from two choices and check to see if the prediction was correct.</p>	<p style="text-align: center; margin: 0;"><i>Participatory:</i></p> <p>MA.7.P.7.Pa.a Solve problems by selecting preferred or necessary item given two or more options in different activities in multiple settings.</p>

Grade 8

MA.	8.	A.	1.	1
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Benchmark

Body of Knowledge Key:

A ~ Algebra

C ~ Calculus

D ~ Discrete Mathematics

F ~ Financial Literacy

G ~ Geometry

P ~ Probability

S ~ Statistics

T ~ Trigonometry

Access Points Coding Scheme

MA.	8.	A.	1.	In.a
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Access Point

Access Points Key:

In ~ Independent

Su ~ Supported

Pa ~ Participatory

K-8 MATHEMATICS STANDARDS

GRADE 8

BIG IDEA 1: *Analyze and represent linear functions and solve linear equations and systems of linear equations.*

BENCHMARK CODE	BENCHMARK
MA.8.A.1.1	Create and interpret tables, graphs, and models to represent, analyze, and solve problems related to linear equations, including analysis of domain, range and the difference between discrete and continuous data.
MA.8.A.1.2	Interpret the slope and the x- and y-intercepts when graphing a linear equation for a real-world problem.
MA.8.A.1.3	Use tables, graphs, and models to represent, analyze, and solve real-world problems related to systems of linear equations.
MA.8.A.1.4	Identify the solution to a system of linear equations using graphs.
MA.8.A.1.5	Translate among verbal, tabular, graphical and algebraic representations of linear functions.
MA.8.A.1.6	Compare the graphs of linear and non-linear functions for real-world situations.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.8.A.1.In.a Use information from physical models, diagrams, tables, and graphs to solve addition, subtraction, multiplication, and division number sentences (equations) based on real-world problems.</p> <p>MA.8.A.1.In.b Identify the relationship between two sets of related data such as ordered number pairs in a table.</p> <p>MA.8.A.1.In.c Translate problem situations into number sentences (equations) involving addition and subtraction of two-digit numbers and multiplication and division facts using a problem solving strategy.</p>	<p>MA.8.A.1.Su.a Use information from physical models, diagrams, tables, and pictographs to solve number sentences (equations) involving addition and subtraction with one-digit and two-digit numbers.</p> <p>MA.8.A.1.Su.b Describe the relationship (1 more or 1 less) between two sets of related numbers.</p> <p>MA.8.A.1.Su.c Translate real-world situations into number sentences (equations) involving addition and subtraction using information from physical and visual models, tables, and pictographs.</p> <p>MA.8.A.1.Su.d Use counting and grouping to join (multiply) and separate (divide) quantities to 50 using sets with the same number of objects or pictures to solve real-world problems.</p>	<p>MA.8.A.1.Pa.a Identify missing items from familiar sets.</p> <p>MA.8.A.1.Pa.b Follow a repeating pattern with three or more elements in a familiar routine or activity in two or more settings.</p>

BIG IDEA 2: Analyze two- and three-dimensional figures by using distance and angle.

BENCHMARK CODE	BENCHMARK
MA.8.G.2.1	Use similar triangles to solve problems that include height and distances.
MA.8.G.2.2	Classify and determine the measure of angles, including angles created when parallel lines are cut by transversals.
MA.8.G.2.3	Demonstrate that the sum of the angles in a triangle is 180-degrees and apply this fact to find unknown measure of angles, and the sum of angles in polygons.
MA.8.G.2.4	Validate and apply Pythagorean Theorem to find distances in real world situations or between points in the coordinate plane.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.8.G.2.In.a Identify triangles that are the same shape but different size (similar) using physical and visual models.</p> <p>MA.8.G.2.In.b Form intersecting lines and identify the angles as acute, obtuse, or right angles using a model of a right angle.</p> <p>MA.8.G.2.In.c Identify examples of parallel lines in the environment.</p> <p>MA.8.G.2.In.d Identify angles within triangles as acute, obtuse, or right angles using a right angle as a model.</p> <p>MA.8.G.2.In.e Measure the sides of a right triangle to determine the perimeter.</p> <p>MA.8.G.2.In.f Locate the right angle and the side opposite the right angle (hypotenuse) in a right triangle.</p>	<p>MA.8.G.2.Su.a Match triangles that are the same shape but different size (similar) using physical models.</p> <p>MA.8.G.2.Su.b Identify angles formed by lines that cross (intersecting lines).</p> <p>MA.8.G.2.Su.c Locate the right angle within a triangle.</p> <p>MA.8.G.2.Su.d Measure the length of each side of a triangle.</p>	<p>MA.8.G.2.Pa.a Demonstrate understanding of three or more directional concepts in daily activities in more than one setting.</p> <p>MA.8.G.2.Pa.b Place familiar objects in three or more designated locations in routines and activities.</p> <p>MA.8.G.2.Pa.c Match familiar objects or pictures based on a given feature, such as color, size, or shape, to complete tasks in activities.</p> <p>MA.8.G.2.Pa.d Select large or small version of two or more objects in daily activities.</p>

BIG IDEA 3: Analyze and summarize data sets.

BENCHMARK CODE	BENCHMARK	
MA.8.S.3.1	Select, organize and construct appropriate data displays, including box and whisker plots, scatter plots, and lines of best fit to convey information and make conjectures about possible relationships.	
MA.8.S.3.2	Determine and describe how changes in data values impact measures of central tendency.	
Access Points for Students with Significant Cognitive Disabilities		
Independent:	Supported:	Participatory:
<p>MA.8.S.3.In.a Organize data into categories, identify the labels, and display in bar and simple line graphs.</p> <p>MA.8.S.3.In.b Determine the largest and smallest numbers in a set of data, the number that occurs most often (mode), and the number in the middle (median) of a set of data with up to 9 numbers.</p>	<p>MA.8.S.3.Su.a Organize data in pictographs and match the labels for categories.</p> <p>MA.8.S.3.Su.b Identify the number that occurs most frequently (mode) in a set of data with up to 5 numbers.</p>	<p>MA.8.S.3.Pa.a Count the objects, pictures, or symbols used in a pictograph or chart and identify a total to 3 or more.</p>

SUPPORTING IDEAS

Algebra

BENCHMARK CODE	BENCHMARK	
MA.8.A.4.1	Solve literal equations for a specified variable.	
MA.8.A.4.2	Solve and graph one- and two-step inequalities in one variable.	
Access Points for Students with Significant Cognitive Disabilities		
Independent:	Supported:	Participatory:
<p>MA.8.A.4.In.a Identify the meaning of the variables in stated formulas (literal equations) to solve problems involving area and perimeter.</p> <p>MA.8.A.4.In.b Translate real-world problem situations into number sentences (equations and inequalities) involving addition, subtraction, and multiplication using visual models, tables, and graphs.</p>	<p>MA.8.A.4.Su.a Demonstrate how to determine the total length of all the sides (perimeter) of figures such as rectangles to solve problems.</p> <p>MA.8.A.4.Su.b Translate real-world problem situations into number sentences (equations) involving addition and subtraction of one-digit and two-digit numbers using physical and visual models and tables.</p>	<p>MA.8.A.4.Pa.a Identify a given quantity to 3 or more and add 1 more in an activity to solve problems.</p> <p>MA.8.A.4.Pa.b Identify a given quantity to 3 or more and take away 1 in an activity to solve problems.</p>

SUPPORTING IDEAS

Geometry and Measurement

BENCHMARK CODE	BENCHMARK	
MA.8.G.5.1	Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)) and dimensions including temperature, area, volume, and derived units to solve problems.	
Access Points for Students with Significant Cognitive Disabilities		
<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
MA.8.G.5.In.a Use tools such as charts and technology to convert measures within the same system, including money, length, time and capacity.	MA.8.G.5.Su.a Identify standard units of measurement for length, weight, and capacity. MA.8.G.5.Su.b Identify time to the minute using a clock.	MA.8.G.5.Pa.a Match familiar two-dimensional figures based on a given feature, such as size and shape to complete tasks in activities. MA.8.G.5.Pa.b Use a daily schedule to transition from one activity to the next in the school setting.

SUPPORTING IDEAS

Number and Operations

BENCHMARK CODE	BENCHMARK
MA.8.A.6.1	Use exponents and scientific notation to write large and small numbers and vice versa and to solve problems.
MA.8.A.6.2	Make reasonable approximations of square roots and mathematical expressions that include square roots, and use them to estimate solutions to problems and to compare mathematical expressions involving real numbers and radical expressions.
MA.8.A.6.3	Simplify real number expressions using the laws of exponents.
MA.8.A.6.4	Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, and irrational numbers) using multi-step and real world problems.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.8.A.6.In.a Express, represent, and use whole numbers to 1000 in various contexts, including time, money, and measurement.</p> <p>MA.8.A.6.In.b Express, represent, and use fractions including halves, fourths, thirds, eighths, and sixths using whole objects or sets, number names, and numerals in various contexts, including measurement.</p> <p>MA.8.A.6.In.c Express, represent, and use percents, including 25%, 50%, 75%, and 100%; and decimals in the context of money.</p> <p>MA.8.A.6.In.d Use a grouping strategy or place value to round whole numbers to 1000 to the nearest ten or hundred to determine a reasonable estimate in problem situations, and check for accuracy.</p>	<p>MA.8.A.6.Su.a Express, represent, and use whole numbers to 100 in various contexts, including time and money.</p> <p>MA.8.A.6.Su.b Express, represent, and use fractions, such as halves, fourths, and thirds, using whole objects or sets, pictures, number names, and numerals in various contexts.</p> <p>MA.8.A.6.Su.c Use counting, grouping, and place value to identify the value of whole numbers to 100.</p> <p>MA.8.A.6.Su.d Identify values of individual coins and bills written as a decimal.</p> <p>MA.8.A.6.Su.e Identify percents including 50% and 100%.</p>	<p>MA.8.A.6.Pa.a Identify a specified part of three or more objects.</p> <p>MA.8.A.6.Pa.b Count objects or actions to 3 or more in multiple activities.</p> <p>MA.8.A.6.Pa.c Identify quantity/number in sets to 3.</p> <p>MA.8.A.6.Pa.d Respond to a gesture or imitate a model to exchange a predetermined amount of money for a preferred object in the school setting.</p> <p>MA.8.A.6.Pa.e Communicate desire for more, none, and less in two or more activities in the school setting.</p> <p>MA.8.A.6.Pa.f Solve problems by selecting the preferred or necessary item when given three or more options for different activities in multiple settings.</p>

FLORIDA MATHEMATICS STANDARDS

SECONDARY BODIES OF KNOWLEDGE

- These Bodies of Knowledge (BOK) do NOT represent courses. Courses (such as Algebra I or Pre-Calculus) will be developed from these standards and individual courses may have standards from more than one BOK.
- ☀ The sunbursts denote benchmarks that include content that all students should know and be able to do. These benchmarks are considered to be appropriate for statewide assessment. Some benchmarks are divided into partial sunburst and partial non-sunburst. This is indicated by color or shading of words to denote the aspect of the benchmark that is applicable to the sunburst categorization.
- There will be some Florida mathematics courses with curriculum defined by other organizations (such as College Board for Advanced Placement Calculus or International Baccalaureate mathematics courses).
- Access points have been developed for the sunburst benchmarks in the BOK's of Algebra, Discrete Mathematics, Geometry, Probability, Statistics, and Trigonometry. Financial Literacy has no sunburst benchmarks, but includes critical skills for students with significant cognitive disabilities. Access points are written for these skills and will be assessed on the Florida Alternate Assessment.

Bodies of Knowledge Coding Scheme

MA.	912.	A.	1.	1
Subject	Grade Level	Body of Knowledge	Standard	Benchmark

Access Points Coding Scheme

MA.	912.	A.	1.	In.a
Subject	Grade Level	Body of Knowledge	Standard	Access Point

Body of Knowledge Key:

- | | |
|--------------------------|----------------|
| A ~ Algebra | S~Statistics |
| C ~ Calculus | T~Trigonometry |
| D ~ Discrete Mathematics | |
| F ~ Financial Literacy | |
| G ~ Geometry | |
| P ~ Probability | |

Access Points Key:

- In ~ Independent
 Su ~ Supported
 Pa ~ Participatory

Algebra Body of Knowledge

MA.	912.	A.	1.	1
Subject	Grade Level	Body of Knowledge	Standard	Benchmark

Access Points Coding Scheme

MA.	912.	A.	1.	In.a
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Access Point

Access Points Key:

In ~ Independent

Su ~ Supported

Pa ~ Participatory

ALGEBRA BODY OF KNOWLEDGE

Standard 1: Real and Complex Number Systems

Students expand and deepen their understanding of real and complex numbers by comparing expressions and performing arithmetic computations, especially those involving square roots and exponents. They use the properties of real numbers to simplify algebraic expressions and equations, and they convert between different measurement units using dimensional analysis.

	Benchmark Code	Benchmark
✱	MA.912.A.1.1	Know equivalent forms of real numbers (including integer exponents and radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers).
✱	MA.912.A.1.2	Compare real number expressions.
✱	MA.912.A.1.3	Simplify real number expressions using the laws of exponents.
✱	MA.912.A.1.4	Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, and irrational numbers) using multi-step and real-world problems.
✱	MA.912.A.1.5	Use dimensional (unit) analysis to perform conversions between units of measure, including rates.
	MA.912.A.1.6	Identify the real and imaginary parts of complex numbers and perform basic operations.
	MA.912.A.1.7	Represent complex numbers geometrically.
	MA.912.A.1.8	Use the zero product property of real numbers in a variety of contexts to identify solutions to equations.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.912.A.1.In.a Identify and use equivalent forms of fractions, such as halves, fourths, thirds, sixths, eighths, tenths, and sixteenths; decimals to the hundredths place; and percents, such as 25%, 50%, 75%, 100%, 33%, and 67%, using visual and numerical representation in real-world situations.</p> <p>MA.912.A.1.In.b Identify examples of positive and negative whole numbers in real-world situations.</p> <p>MA.912.A.1.In.c Determine the value of numbers to 10 with the exponents 2 and 3, such as 4^2 and 3^3, using physical and visual patterns.</p> <p>MA.912.A.1.In.d Compare and order numbers, including whole numbers, fractions, decimals, and percents, expressed in the same form to solve problems in real-world situations.</p> <p>MA.912.A.1.In.e Simplify fractions and decimals by reducing to lowest terms.</p> <p>MA.912.A.1.In.f Simplify improper fractions, such as $\frac{8}{4}$, by using division facts.</p> <p>MA.912.A.1.In.g Select the operation and solve two-step mathematical problems involving addition, subtraction, multiplication, and division of two- and three-digit numbers in real-world situations using problem-solving strategies, such as recognizing symbols and key information and using visual representations.</p> <p>MA.912.A.1.In.h Use tools, including charts and technology, to convert standard units of measurement within the same system, such as money, length, capacity, time, and weight.</p>	<p>MA.912.A.1.Su.a Identify equivalent forms of fractions, such as halves, thirds, and fourths; percents, such as 50%, 33%, and 25%; and decimals in the context of money using visual and numerical representation in real-world situations.</p> <p>MA.912.A.1.Su.b Identify the value of numbers to 5 with the exponent 2 using physical and visual models.</p> <p>MA.912.A.1.Su.c Compare and order whole numbers, fractions, including halves, fourths, thirds, and sixths; and decimals including .25, .50, .75, 1.00, in real-world situations, including money and measurement.</p> <p>MA.912.A.1.Su.d Simplify whole numbers to 100 using place value and grouping with visual representation.</p> <p>MA.912.A.1.Su.e Select the operation and solve one-step mathematical problems involving addition and subtraction of one-digit and two-digit numbers in real-world situations using physical and visual representations and problem-solving strategies, such as recognizing key information and symbols.</p> <p>MA.912.A.1.Su.f Use tools, such as simple charts and technology, to convert standard units of measurement within the same system, such as money, length, and capacity.</p>	<p>MA.912.A.1.Pa.a Communicate desire for more, none, and less in activities in real-world activities.</p> <p>MA.912.A.1.Pa.b Identify a missing part of an object, picture, or symbol.</p> <p>MA.912.A.1.Pa.c Count objects or actions to 5 or more in multiple activities.</p>

Standard 2: Relations and Functions

Students draw and interpret graphs of relations. They understand the notation and concept of a function, find domains and ranges, and link equations to functions.

	Benchmark Code	Benchmark
✱	MA.912.A.2.1	Create a graph to represent a real-world situation.
✱	MA.912.A.2.2	Interpret a graph representing a real-world situation.
✱	MA.912.A.2.3	Describe the concept of a function, use function notation, determine whether a given relation is a function, and link equations to functions.
✱	MA.912.A.2.4	Determine the domain and range of a relation.
	MA.912.A.2.5	Graph absolute value equations and inequalities in two variables.
	MA.912.A.2.6	Identify and graph common functions (including but not limited to linear, rational, quadratic, cubic, radical, absolute value).
	MA.912.A.2.7	Perform operations (addition, subtraction, division and multiplication) of functions algebraically, numerically, and graphically.
	MA.912.A.2.8	Determine the composition of functions.
	MA.912.A.2.9	Recognize, interpret, and graph functions defined piece-wise, with and without technology.
	MA.912.A.2.10	Describe and graph transformations of functions
	MA.912.A.2.11	Solve problems involving functions and their inverses.
✱	MA.912.A.2.12	Solve problems using direct , inverse, and joint variations.
	MA.912.A.2.13	Solve real-world problems involving relations and functions.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.912.A.2.In.a Create simple bar, line, and circle graphs to represent data from real-world situations.</p> <p>MA.912.A.2.In.b Interpret simple bar, line, and circle graphs representing data from real-world situations.</p> <p>MA.912.A.2.In.c Identify the mathematical relationship (function) and the type of information represented in a function table or simple graph.</p> <p>MA.912.A.2.In.d Use function tables and simple graphs to determine the mathematical relationship between two numbers representing real-world situations.</p>	<p>MA.912.A.2.Su.a Organize data from real-world situations into categories, identify the labels, and display in pictographs and bar graphs.</p> <p>MA.912.A.2.Su.b Identify which categories have the largest, smallest, or the same amount in pictographs and bar graphs representing real-world situations.</p> <p>MA.912.A.2.Su.c Identify number patterns and relationships using physical and visual models representing real-world situations.</p>	<p>MA.912.A.2.Pa.a Match objects, pictures, or symbols based on a model using one-to-one correspondence to complete tasks in real-world activities.</p> <p>MA.912.A.2.Pa.b Identify a quantity to 4 or higher and add 1 more in routines or activities.</p> <p>MA.912.A.2.Pa.c Identify a quantity to 5 and take 1 away in routines or activities.</p> <p>MA.912.A.2.Pa.d Count the objects, pictures, or symbols used in a pictograph or chart and identify total to 5 or more.</p>

Standard 3: Linear Equations and Inequalities

Students solve linear equations and inequalities.

	Benchmark Code	Benchmark
✱	MA.912.A.3.1	Solve linear equations in one variable that include simplifying algebraic expressions.
✱	MA.912.A.3.2	Identify and apply the distributive, associative, and commutative properties of real numbers and the properties of equality.
✱	MA.912.A.3.3	Solve literal equations for a specified variable.
✱	MA.912.A.3.4	Solve and graph simple and compound inequalities in one variable and be able to justify each step in a solution.
✱	MA.912.A.3.5	Symbolically represent and solve multi-step and real-world applications that involve linear equations and inequalities.
	MA.912.A.3.6	Solve and graph the solutions of absolute value equations and inequalities with one variable.
✱	MA.912.A.3.7	Rewrite equations of a line into slope-intercept form and standard form.
✱	MA.912.A.3.8	Graph a line given any of the following information: a table of values, the x- and y-intercepts, two points, the slope and a point, the equation of the line in slope-intercept form, standard form, or point-slope form.
✱	MA.912.A.3.9	Determine the slope, x-intercept, and y-intercept of a line given its graph, its equation, or two points on the line.
✱	MA.912.A.3.10	Write an equation of a line given any of the following information: two points on the line, its slope and one point on the line, or its graph. Also, find an equation of a new line parallel to a given line, or perpendicular to a given line, through a given point on the new line.
✱	MA.912.A.3.11	Write an equation of a line that models a data set and use the equation or the graph to make predictions. Describe the slope of the line in terms of the data, recognizing that the slope is the rate of change.
✱	MA.912.A.3.12	Graph a linear equation or inequality in two variables with and without graphing technology. Write an equation or inequality represented by a given graph.
✱	MA.912.A.3.13	Use a graph to approximate the solution of a system of linear equations or inequalities in two variables with and without technology.
✱	MA.912.A.3.14	Solve systems of linear equations and inequalities in two and three variables using graphical, substitution, and elimination methods.
✱	MA.912.A.3.15	Solve real-world problems involving systems of linear equations and inequalities in two and three variables .

Standard 3: Linear Equations and Inequalities

Students solve linear equations and inequalities.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.912.A.3.In.a Solve equations with one unknown (variable) involving addition, multiplication, subtraction, and division of whole numbers representing problems in real-world situations.</p> <p>MA.912.A.3.In.b Use the commutative, associative, and equality properties of addition as strategies to solve equations involving real-world situations.</p> <p>MA.912.A.3.In.c Use the commutative and associative property of multiplication and the properties of one and zero for multiplication as strategies to solve equations involving real-world situations.</p> <p>MA.912.A.3.In.d Solve real-world equations and inequalities with one unknown (variable) using visual models to represent the procedure.</p> <p>MA.912.A.3.In.e Create function tables and simple graphs that show the mathematical relationship between number pairs.</p> <p>MA.912.A.3.In.f Use function tables and simple graphs representing equations to make predictions for real-world situations.</p>	<p>MA.912.A.3.Su.a Solve number sentences (equations) involving addition and subtraction of one-digit and two-digit whole numbers based on real-world situations using visual models.</p> <p>MA.912.A.3.Su.b Use the commutative property and the additive identity property of addition as a strategy to solve number sentences (equations).</p> <p>MA.912.A.3.Su.c Use the concepts of equality and inequality as strategies to solve problems involving real-world situations.</p> <p>MA.912.A.3.Su.d Solve equations involving addition and subtraction using visual models, such as a number line, in real-world situations.</p> <p>MA.912.A.3.Su.e Use repeated addition of the same number to solve one-digit multiplication facts and repeated subtraction of the same number to solve one-digit division facts in real-world situations.</p> <p>MA.912.A.3.Su.f Use function tables and simple graphs representing equations to make predictions for real-world situations.</p>	<p>MA.912.A.3.Pa.a Match two sets of objects, pictures, or symbols to identical items in real-world tasks using one-to-one correspondence.</p> <p>MA.912.A.3.Pa.b Identify quantities to 4 or more and add 1 more in real-world tasks.</p> <p>MA.912.A.3.Pa.c Identify quantities to 5 or more and take 1 away in real-world tasks.</p>

Standard 4: Polynomials

Students perform operations on polynomials. They find factors of polynomials, learning special techniques for factoring quadratics. They understand the relationships among the solutions of polynomial equations, the zeros of a polynomial function, the x-intercepts of a graph, and the factors of a polynomial.

	Benchmark Code	Benchmark
✱	MA.912.A.4.1	Simplify monomials and monomial expressions using the laws of integral exponents.
✱	MA.912.A.4.2	Add, subtract, and multiply polynomials.
✱	MA.912.A.4.3	Factor polynomial expressions.
✱	MA.912.A.4.4	Divide polynomials by monomials and polynomials with various techniques, including synthetic division.
	MA.912.A.4.5	Graph polynomial functions with and without technology and describe end behavior.
	MA.912.A.4.6	Use theorems of polynomial behavior (including but not limited to the Fundamental Theorem of Algebra, Remainder Theorem, the Rational Root Theorem, Descartes' Rule of Signs, and the Conjugate Root Theorem) to find the zeros of a polynomial function.
	MA.912.A.4.7	Write a polynomial equation for a given set of real and/or complex roots.
	MA.912.A.4.8	Describe the relationships among the solutions of an equation, the zeros of a function, the x-intercepts of a graph, and the factors of a polynomial expression, with and without technology.
	MA.912.A.4.9	Use graphing technology to find approximate solutions for polynomial equations.
	MA.912.A.4.10	Use polynomial equations to solve real-world problems.
	MA.912.A.4.11	Solve a polynomial inequality by examining the graph with and without the use of technology.
	MA.912.A.4.12	Apply the Binomial Theorem.

Standard 4: Polynomials

Students perform operations on polynomials. They find factors of polynomials, learning special techniques for factoring quadratics. They understand the relationships among the solutions of polynomial equations, the zeros of a polynomial function, the x-intercepts of a graph, and the factors of a polynomial.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
MA.912.A.4.In.a Simplify expressions with one unknown (variable) by identifying like terms.	MA.912.A.4.Su.a Solve number sentences (equations) with one unknown involving addition and subtraction facts using physical and visual models.	MA.912.A.4.Pa.a Follow a repeating pattern with three or more elements in a familiar routine or activity in two or more settings.
MA.912.A.4.In.b Solve equations with one unknown (variable) involving addition, subtraction, and multiplication.	MA.912.A.4.Su.b Identify like and unlike terms in number sentences representing real-world situations.	MA.912.A.4.Pa.b Sort three or more objects by feature in real-world tasks.
MA.912.A.4.In.c Combine like and unlike terms in number sentences representing real-world situations.	MA.9.12.A.4.Su.c Identify factors of whole numbers by using division facts.	MA.912.A.4.Pa.c Identify a missing item from two or more familiar sets.
MA.9.12.A.4.In.d Identify factors of expressions with whole numbers by dividing.		

Standard 5: Rational Expressions and Equations

Students simplify rational expressions and solve rational equations using what they have learned about factoring polynomials.

	Benchmark Code	Benchmark
✱	MA.912.A.5.1	Simplify algebraic ratios.
	MA.912.A.5.2	Add, subtract, multiply, and divide rational expressions.
	MA.912.A.5.3	Simplify complex fractions.
✱	MA.912.A.5.4	Solve algebraic proportions.
	MA.912.A.5.5	Solve rational equations.
	MA.912.A.5.6	Identify removable and non-removable discontinuities and vertical, horizontal, and oblique asymptotes of a graph of a rational function, find the zeros, and graph the function.
	MA.912.A.5.7	Solve real-world problems involving rational equations (mixture, distance, work, interest, and ratio).

Access Points for Students with Significant Cognitive Disabilities

Independent:	Supported:	Participatory:
<p>MA.912.A.5.In.a Use numbers to represent ratios in real-world situations.</p> <p>MA.912.A.5.In.b Solve problems involving ratios in real-world situations.</p>	<p>MA.912.A.5.Su.a Use simple ratios represented by physical and visual models to solve real-world problems.</p>	<p>MA.912.A.5.Pa.a Follow a model to group objects, pictures, or symbols by a given feature.</p>

Standard 6: Radical Expressions and Equations

Students simplify and perform operations on radical expressions and equations. They also rationalize square root expressions and understand and use the concepts of negative and rational exponents. They add, subtract, multiply, divide, and simplify radical expressions and expressions with rational exponents. Students will solve radical equations and equations with terms that have rational exponents.

	Benchmark Code	Benchmark
✱	MA.912.A.6.1	Simplify radical expressions.
✱	MA.912.A.6.2	Add, subtract, multiply and divide radical expressions (square roots and higher).
	MA.912.A.6.3	Simplify expressions using properties of rational exponents.
	MA.912.A.6.4	Convert between rational exponent and radical forms of expressions.
	MA.912.A.6.5	Solve equations that contain radical expressions.

Access Points for Students with Significant Cognitive Disabilities

Independent:	Supported:	Participatory:
<p>MA.912.A.6.In.a Identify perfect squares and their factors, including 1, 4, 9, 16, 25, 49, 64, 100, and 144 using visual models.</p> <p>MA.912.A.6.In.b Use factors of perfect squares to solve problems in real-world situations.</p>	<p>MA.912.A.6.Su.a Use physical models of perfect squares, including 1, 4, 9, 16, 25, and 100 to solve problems.</p>	<p>MA.912.A.6.Pa.a Use one-to-one correspondence to match two sets of objects, pictures, or symbols having the same quantity to 5 or more in real-world tasks.</p>

Standard 7: Quadratic Equations

Students draw graphs of quadratic functions. They solve quadratic equations and solve these equations by factoring, completing the square and by using the quadratic formula. They also use graphing calculators to find approximate solutions of quadratic equations.

	Benchmark Code	Benchmark
✱	MA.912.A.7.1	Graph quadratic equations with and without graphing technology.
✱	MA.912.A.7.2	Solve quadratic equations over the real numbers by factoring, and by using the quadratic formula.
	MA.912.A.7.3	Solve quadratic equations over the real numbers by completing the square.
	MA.912.A.7.4	Use the discriminant to determine the nature of the roots of a quadratic equation.
	MA.912.A.7.5	Solve quadratic equations over the complex number system.
	MA.912.A.7.6	Identify the axis of symmetry, vertex, domain, range and intercept(s) for a given parabola.
	MA.912.A.7.7	Solve non-linear systems of equations with and without using technology.
✱	MA.912.A.7.8	Use quadratic equations to solve real-world problems.
	MA.912.A.7.9	Solve optimization problems.
	MA.912.A.7.10	Use graphing technology to find approximate solutions of quadratic equations.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.912.A.7.In.a Use information from tables and other types of visual models to plot numbers on a line graph representing real-world situations.</p> <p>MA.912.A.7.In.b Solve equations involving given literal formulas related to real-world situations.</p> <p>MA.912.A.7.In.c Compare quantities from real-world situations represented on a graph and explain similarities and differences.</p>	<p>MA.912.A.7.Su.a Use information from real-world situations to locate numbers on a number line to solve equations involving addition and subtraction of whole numbers.</p> <p>MA.912.A.7.Su.b Identify information from tables and simple line graphs representing real-world situations.</p> <p>MA.912.A.7.Su.c Solve number sentences (equations) using visual and physical models representing real-world situations.</p> <p>MA.912.A.7.Su.d Compare quantities from similar real-world situations represented on a graph.</p>	<p>MA.912.A.7.Pa.a Solve problems by requesting items missing from three or more sets used in real-world activities.</p> <p>MA.912.A.7.Pa.b Compare the number of objects, pictures, or symbols used in a three-category pictograph to identify which has more or less.</p>

Standard 8: Logarithmic and Exponential Functions

Students understand the concepts of logarithmic and exponential functions. They graph exponential functions and solve problems of growth and decay. They understand the inverse relationship between exponents and logarithms and use it to prove laws of logarithms and to solve equations. They convert logarithms between bases and simplify logarithmic expressions.

	Benchmark Code	Benchmark
	MA.912.A.8.1	Define exponential and logarithmic functions and determine their relationship.
	MA.912.A.8.2	Define and use the properties of logarithms to simplify logarithmic expressions and to find their approximate values.
	MA.912.A.8.3	Graph exponential and logarithmic functions.
	MA.912.A.8.4	Prove laws of logarithms.
	MA.912.A.8.5	Solve logarithmic and exponential equations.
	MA.912.A.8.6	Use the change of base formula.
	MA.912.A.8.7	Solve applications of exponential growth and decay.

Standard 9: Conic Sections

Students write equations and draw graphs of conic sections (circle, ellipse, parabola, and hyperbola), thus relating an algebraic representation to a geometric one.

	Benchmark Code	Benchmark
	MA.912.A.9.1	Write the equations of conic sections in standard form and general form, in order to identify the conic section and to find its geometric properties (foci, asymptotes, eccentricity, etc.).
	MA.912.A.9.2	Graph conic sections with and without using graphing technology.
	MA.912.A.9.3	Solve real-world problems involving conic sections

Standard 10: Mathematical Reasoning and Problem Solving

In a general sense, all of mathematics is problem solving. In all of their mathematics, students use problem-solving skills: they choose how to approach a problem, they explain their reasoning, and they check their results.

	Benchmark Code	Benchmark
✱	MA.912.A.10.1	Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess- and-check, solving a simpler problem, writing an equation, working backwards, and create a table.
✱	MA.912.A.10.2	Decide whether a solution is reasonable in the context of the original situation.
✱	MA.912.A.10.3	Decide whether a given statement is always, sometimes, or never true (statements involving linear or quadratic expressions, equations, or inequalities rational or radical expressions or logarithmic or exponential functions).
	MA.912.A.10.4	Use counterexamples to show that statements are false.

Access Points for Students with Significant Cognitive Disabilities

Independent:	Supported:	Participatory:
<p>MA.912.A.10.In.a Use a variety of problem-solving strategies, such as finding key information to determine the correct operation and using graphic representations for numbers, to solve real-world problems.</p> <p>MA.912.A.10.In.b Use estimation strategies, such as rounding, grouping, and comparing, to determine if answers are reasonable.</p>	<p>MA.912.A.10.Su.a Use visual and physical models as strategies for solving real-world mathematical problems.</p> <p>MA.912.A.10.Su.b Use resources, such as calculators, to verify accuracy of solutions to problems.</p>	<p>MA.912.A.10.Pa.a. Solve real-world problems involving quantities to 5 or more following established procedures.</p> <p>MA.912.A.10.Pa.b Solve real-word problems involving whole-part relationships following established procedures.</p>

Calculus

Body of Knowledge

MA.	912.	C.	1.	1
Subject	Grade Level	Body of Knowledge	Standard	Benchmark

Access Points Coding Scheme

MA.	912.	C.	1.	In.a
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Access Point

Access Points Key:

In ~ Independent

Su ~ Supported

Pa ~ Participatory

CALCULUS BODY OF KNOWLEDGE

Standard 1: Limits and Continuity

Students develop an understanding of the concept of limit by estimating limits graphically and numerically, and evaluating limits analytically. They extend the idea of a limit to one-sided limits and limits at infinity. They use limits to define and understand the concept of continuity, decide whether a function is continuous at a point, and find types of discontinuities. They understand and apply continuity theorems.

	Benchmark Code	Benchmark
	MA.912.C.1.1	Understand the concept of limit and estimate limits from graphs and tables of values.
	MA.912.C.1.2	Find limits by substitution.
	MA.912.C.1.3	Find limits of sums, differences, products, and quotients.
	MA.912.C.1.4	Find limits of rational functions that are undefined at a point.
	MA.912.C.1.5	Find one-sided limits.
	MA.912.C.1.6	Find limits at infinity.
	MA.912.C.1.7	Decide when a limit is infinite and use limits involving infinity to describe asymptotic behavior.
	MA.912.C.1.8	Find special limits such as $\lim_{x \rightarrow 0} \frac{\sin x}{x}$.
	MA.912.C.1.9	Understand continuity in terms of limits.
	MA.912.C.1.10	Decide if a function is continuous at a point.
	MA.912.C.1.11	Find the types of discontinuities of a function.
	MA.912.C.1.12	Understand and use the Intermediate Value Theorem on a function over a closed interval.
	MA.912.C.1.13	Understand and apply the Extreme Value Theorem: If $f(x)$ is continuous over a closed interval, then f has a maximum and a minimum on the interval.

Standard 2: Differential Calculus

Students develop an understanding of the derivative as an instantaneous rate of change, using geometrical, numerical, and analytical methods. They use this definition to find derivatives of algebraic and transcendental functions and combinations of these functions (using, for example, sums, composites, and inverses). Students find second and higher order derivatives. They understand and use the relationship between differentiability and continuity. They understand and apply the Mean Value Theorem.

Students find derivatives of algebraic, trigonometric, logarithmic, and exponential functions. They find derivatives of sums, products, and quotients, and composite and inverse functions. They find derivatives of higher order and use logarithmic differentiation and the Mean Value Theorem.

	Benchmark Code	Benchmark
	MA.912.C.2.1	Understand the concept of derivative geometrically, numerically, and analytically, and interpret the derivative as an instantaneous rate of change, or as the slope of the tangent line.
	MA.912.C.2.2	State, understand, and apply the definition of derivative.
	MA.912.C.2.3	Find the derivatives of functions, including algebraic, trigonometric, logarithmic, and exponential functions.
	MA.912.C.2.4	Find the derivatives of sums, products, and quotients.
	MA.912.C.2.5	Find the derivatives of composite functions, using the Chain Rule.
	MA.912.C.2.6	Find the derivatives of implicitly-defined functions.
	MA.912.C.2.7	Find derivatives of inverse functions.
	MA.912.C.2.8	Find second derivatives and derivatives of higher order.
	MA.912.C.2.9	Find derivatives using logarithmic differentiation.
	MA.912.C.2.10	Understand and use the relationship between differentiability and continuity.
	MA.912.C.2.11	Understand and apply the Mean Value Theorem.

Standard 3: Applications of Derivatives

Students apply what they learn about derivatives to find slopes of curves and the related tangent lines. They analyze and graph functions, finding where they are increasing or decreasing, their maximum and minimum points, their points of inflection, and their concavity. They solve optimization problems, find average and instantaneous rates of change (including velocities and accelerations), and model rates of change.

Students find slopes and equations of tangent lines, maximum and minimum points, and points of inflection. They solve optimization problems and find rates of change.

	Benchmark Code	Benchmark
	MA.912.C.3.1	Find the slope of a curve at a point, including points at which there are vertical tangent lines and no tangent lines.
	MA.912.C.3.2	Find an equation for the tangent line to a curve at a point and a local linear approximation.
	MA.912.C.3.3	Decide where functions are decreasing and increasing. Understand the relationship between the increasing and decreasing behavior of f and the sign of f' .
	MA.912.C.3.4	Find local and absolute maximum and minimum points.
	MA.912.C.3.5	Find points of inflection of functions. Understand the relationship between the concavity of f and the sign of f'' . Understand points of inflection as places where concavity changes.
	MA.912.C.3.6	Use first and second derivatives to help sketch graphs. Compare the corresponding characteristics of the graphs of f , f' , and f'' .
	MA.912.C.3.7	Use implicit differentiation to find the derivative of an inverse function.
	MA.912.C.3.8	Solve optimization problems.
	MA.912.C.3.9	Find average and instantaneous rates of change. Understand the instantaneous rate of change as the limit of the average rate of change. Interpret a derivative as a rate of change in applications, including velocity, speed, and acceleration.
	MA.912.C.3.10	Find the velocity and acceleration of a particle moving in a straight line.
	MA.912.C.3.11	Model rates of change, including related rates problems.
	MA.912.C.3.12	Solve problems using the Newton-Raphson method.

Standard 4: Integral Calculus

Students understand that integration is used to find areas and they evaluate integrals using rectangular approximations. From this, they develop the idea that integration is the inverse operation to differentiation — the Fundamental Theorem of Calculus. They use this result to find definite and indefinite integrals, including using the method of integration by substitution. They also apply approximate methods, such as the Trapezoidal Rule, to find definite integrals.

Students define integrals using Riemann sums, use the Fundamental Theorem of Calculus to find integrals using antiderivatives, and use basic properties of integrals. They integrate by substitution and find approximate integrals.

MA.912.C.4.1	Use rectangle approximations to find approximate values of integrals.
MA.912.C.4.2	Calculate the values of Riemann Sums over equal subdivisions using left, right, and midpoint evaluation points.
MA.912.C.4.3	Interpret a definite integral as a limit of Riemann sums.
MA.912.C.4.4	Interpret a definite integral of the rate of change of a quantity over an interval as the change of the quantity over the interval. That is, $\int_a^b f'(x)dx = f(b) - f(a)$ (Fundamental Theorem of Calculus)
MA.912.C.4.5	Use the Fundamental Theorem of Calculus to evaluate definite and indefinite integrals and to represent particular antiderivatives. Perform analytical and graphical analysis of functions so defined.
MA.912.C.4.6	Use these properties of definite integrals: <ul style="list-style-type: none">• $\int_a^b [f(x) + g(x)]dx = \int_a^b f(x)dx + \int_a^b g(x)dx$• $\int_a^b k \cdot f(x)dx = k \int_a^b f(x)dx$• $\int_a^a f(x)dx = 0$• $\int_a^b f(x)dx = -\int_b^a f(x)dx$• $\int_a^b f(x)dx + \int_b^c f(x)dx = \int_a^c f(x)dx$• If $f(x) \leq g(x)$ on $[a, b]$, then $\int_a^b f(x)dx \leq \int_a^b g(x)dx$
MA.912.C.4.7	Use integration by substitution (or change of variable) to find values of integrals
MA.912.C.4.8	Use Riemann Sums, the Trapezoidal Rule, and technology to approximate definite integrals of functions represented algebraically, geometrically, and by tables of values.

Standard 5: Applications of Integration

Students apply what they learn about integrals to finding velocities from accelerations, solving separable differential equations, and finding areas and volumes. They also apply integration to model and solve problems in physics, biology, economics, etc.

Students find velocity functions and position functions from their derivatives, solve separable differential equations, and use definite integrals to find areas and volumes.

	Benchmark Code	Benchmark
	MA.912.C.5.1	Find specific antiderivatives using initial conditions, including finding velocity functions from acceleration functions, finding position functions from velocity functions, and solving applications related to motion along a line.
	MA.912.C.5.2	Solve separable differential equations and use them in modeling.
	MA.912.C.5.3	Solve differential equations of the form $\frac{dy}{dt} = ky$ as applied to growth and decay problems.
	MA.912.C.5.4	Use slope fields to display a graphic representation of the solution to a differential equation and locate particular solutions to the equation.
	MA.912.C.5.5	Use definite integrals to find the area between a curve and the x-axis, or between two curves.
	MA.912.C.5.6	Use definite integrals to find the average value of a function over a closed interval.
	MA.912.C.5.7	Use definite integrals to find the volume of a solid with known cross-sectional area, including solids of revolution.
	MA.912.C.5.8	Apply integration to model and solve problems in physical, biological, and social sciences.

Discrete Mathematics Body of Knowledge

MA.	912.	D.	1.	1
Subject	Grade Level	Body of Knowledge	Standard	Benchmark

Access Points Coding Scheme

MA.	912.	D.	1.	In.a
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Access Point

Access Points Key:

In ~ Independent

Su ~ Supported

Pa ~ Participatory

DISCRETE MATHEMATICS BODY OF KNOWLEDGE

Standard 1: Recursion

Students understand and apply recursive methods to solve problems, including the use of finite differences.

	Benchmark Code	Benchmark
	MA.912.D.1.1	Use recursive and iterative thinking to solve problems, including identification of patterns, population growth and decline, and compound interest.
	MA.912.D.1.2	Use finite differences to solve problems and to find explicit formulas for recurrence relations.
	MA.912.D.1.3	Use mathematical induction to prove various concepts in number theory (such as sums of infinite integer series, divisibility statements, and parity statements), recurrence relations, and other applications.

Standard 2: Graph Theory

Students understand how graphs of vertices joined by edges can model relationships and be used to solve various problems with relation to directed graphs, weighted graphs, networks, tournaments, transportation flows, matching, and coverage.

	Benchmark Code	Benchmark
	MA.912.D.2.1	Use Euler and Hamilton cycles and paths in graphs to solve routing problems.
	MA.912.D.2.2	Use critical path analysis to solve scheduling problems.
	MA.912.D.2.3	Use graph coloring techniques to solve problems.
	MA.912.D.2.4	Use spanning trees, rooted trees, binary trees, and decision trees to solve problems.
	MA.912.D.2.5	Use bin-packing techniques to solve problems concerning optimizing resource usage.

Standard 3: Social Choice

Students analyze election data to evaluate different election methods and use weighted voting techniques to decide voting power within a group. They understand and use fair division techniques to solve apportionment problems.

	Benchmark Code	Benchmark
	MA.912.D.3.1	Use election theory techniques to analyze election data.
	MA.912.D.3.2	Use weighted voting techniques to decide voting power within a group.
	MA.912.D.3.3	Use fair division techniques to divide continuous objects.
	MA.912.D.3.4	Use fair division techniques to solve apportionment problems.

Standard 4: Linear Programming

Students understand how to use linear programming and coordinate geometry to solve simple linear optimization problems.

	Benchmark Code	Benchmark
	MA.912.D.4.1	Solve maximal profit/minimal cost problems.

Standard 5: Game Theory

Students understand and use game theory methods to solve strictly determined games and non-strictly determined games.

	Benchmark Code	Benchmark
	MA.912.D.5.1	Use game theory to solve strictly determined games.
	MA.912.D.5.2	Use game theory to solve non-strictly determined games.

Standard 6: Logic

Students develop an understanding of the fundamentals of propositional logic, arguments, and methods of proof.

	Benchmark Code	Benchmark
	MA.912.D.6.1	Use truth tables to determine truth values of propositional statements.
✱	MA.912.D.6.2	Find the converse, inverse, and contrapositive of a statement.
	MA.912.D.6.3	Determine whether two propositions are logically equivalent.
✱	MA.912.D.6.4	Use methods of direct and indirect proof and determine whether a short proof is logically valid.
✱	MA.912.D.6.5	Identify and give examples of: <ul style="list-style-type: none"> ◦ undefined terms; ◦ axioms; ◦ theorems; ◦ inductive and deductive proofs; and, ◦ inductive and deductive reasoning.
	MA.912.D.6.6	Construct logical arguments using laws of detachment (modus ponens), syllogism, tautology, and contradiction; judge the validity of arguments, and give counterexamples to disprove statements.
	MA.912.D.6.7	Use applications of the universal and existential quantifiers to propositional statements.

Access Points for Students with Significant Cognitive Disabilities

Independent:	Supported:	Participatory:
<p>MA.912.D.6.In.a Determine whether "if, then" statements for common events in real-world situations are true or false.</p> <p>MA.912.D.6.In.b Determine whether two statements have the same mathematical meaning.</p>	<p>MA.912.D.6.Su.a Use pictures and objects to determine whether statements about common events in real-world situations are true or false.</p> <p>MA.912.D.6.SU.b Match two statements that have the same mathematical meaning.</p>	<p>MA.912.D.6.Pa.a Solve problems by selecting the preferred or necessary item when given three or more options for different real-world activities in multiple settings.</p>

Standard 7: Set Theory

Students operate with sets and use set theory to solve problems.

	Benchmark Code	Benchmark
☀	MA.912.D.7.1	Perform set operations such as union and intersection, complement, and cross product.
☀	MA.912.D.7.2	Use Venn diagrams to explore relationships and patterns, and to make arguments about relationships between sets.

Access Points for Students with Significant Cognitive Disabilities

Independent:	Supported:	Participatory:
<p>MA.912.D.7.In.a Identify and sort elements in two sets, combine the sets to identify elements in either set to form a union, and identify the elements that are in both sets (intersection) using physical and visual models.</p> <p>MA.912.D.7.In.b Use Venn diagrams to represent the elements in both sets (intersection) of two sets.</p>	<p>MA.912.D.7.Su.a Sort elements into two sets and combine elements in either set to form a union.</p> <p>MA.912.D.7.Su.b Use physical models to identify elements from both sets that belong together (intersection).</p>	<p>MA.912.D.7.Pa.a Match three or more different objects, pictures, or symbols to a model in real-world activities.</p> <p>MA.912.D.7.Pa.b Match objects, pictures, or symbols based on a specified feature to complete tasks in real-world activities.</p>

Standard 8: Matrices

Students understand how matrices can be used to store and organize data and to solve systems of equations. They also use matrices to solve Markov chain problems that link present events to future events using probabilities.

	Benchmark Code	Benchmark
	MA.912.D.8.1	Use matrices to organize and store data. Perform matrix operations (addition, subtraction, scalar multiplication, multiplication).
	MA.912.D.8.2	Use matrix operations to solve problems.
	MA.912.D.8.3	Use row-reduction techniques to solve problems.
	MA.912.D.8.4	Find the inverse of a matrix and use the inverse to solve problems with and without the use of technology.
	MA.912.D.8.5	Use determinants of 2×2 and 3×3 matrices as well as higher order matrices with and without the use of technology.
	MA.912.D.8.6	Use matrices to solve Markov chain problems that link present events to future events using probabilities.

Standard 9: Vectors

Students recognize vectors in both two- and three-dimensions and that they are represented geometrically and algebraically. Students perform basic operations on vectors, including addition, scalar multiplication, dot product, and cross product. Students solve problems using vectors.

	Benchmark Code	Benchmark
	MA.912.D.9.1	Demonstrate an understanding of the geometric interpretation of vectors and vector operations including addition, scalar multiplication, dot product and cross product in the plane and in three-dimensional space.
	MA.912.D.9.2	Demonstrate an understanding of the algebraic interpretation of vectors and vector operations including addition, scalar multiplication, dot product and cross product in the plane and in three-dimensional space.
	MA.912.D.9.3	Use vectors to model and solve application problems.

Standard 10: Parametric Equations

Students use parametric equations in two dimensions to model time dependant situations and convert parametric equations to rectangular coordinates and vice-versa.

	Benchmark Code	Benchmark
	MA.912.D.10.1	Sketch the graph of a curve in the plane represented parametrically, indicating the direction of motion.
	MA.912.D.10.2	Convert from a parametric representation of a plane curve to a rectangular equation, and vice-versa.
	MA.912.D.10.3	Use parametric equations to model applications of motion in the plane.

Standard 11: Sequences and Series

Students define and use arithmetic and geometric sequences and series.

	Benchmark Code	Benchmark
	MA.912.D.11.1	Define arithmetic and geometric sequences and series.
	MA.912.D.11.2	Use sigma notation to describe series.
	MA.912.D.11.3	Find specified terms of arithmetic and geometric sequences.
	MA.912.D.11.4	Find partial sums of arithmetic and geometric series, and find sums of infinite convergent geometric series. Use Sigma notation where applicable.
	MA.912.D.11.5	Explore and use other sequences found in nature such as the Fibonacci sequence and the golden ratio.

Financial Literacy Body of Knowledge

MA.	912.	F.	1.	1
Subject	Grade Level	Body of Knowledge	Standard	Benchmark

Access Points Coding Scheme

MA.	912.	F.	1.	In.a
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Access Point

Access Points Key:

In ~ Independent

Su ~ Supported

Pa ~ Participatory

FINANCIAL LITERACY BODY OF KNOWLEDGE

Standard 1: Simple and Compound Interest

	Benchmark Code	Benchmark
	MA.912.F.1.1	Explain the difference between simple and compound interest.
	MA.912.F.1.2	Solve problems involving compound interest.
	MA.912.F.1.3	Demonstrate the relationship between simple interest and linear growth
	MA.912.F.1.4	Demonstrate the relationship between compound interest and exponential growth

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.912.F.1.In.a Identify interest on a loan or credit card as money charged for borrowing money.</p> <p>MA.912.F.1.In.b Identify interest on a savings account as money earned by keeping money in the account over time.</p> <p>MA.912.F.1.In.c Add the amount of a loan and amount of interest charged to determine the total amount of money to be repaid.</p> <p>MA.912.F.1.In.d Identify differences in methods for saving money, such as a savings account, money market account, or savings bonds.</p>	<p>MA.912.F.1.Su.a Identify interest as extra money charged when borrowing money.</p> <p>MA.912.F.1.Su.b Identify interest on a savings account as money earned by keeping money in the account.</p> <p>MA.912.F.1.Su.c Identify interest rates used in real-world situations.</p> <p>MA.912.F.1.Su.d Identify a method for saving money, such as a savings account.</p>	<p>MA.912.F.1.Pa.a Respond to a gesture or imitate a model to exchange a predetermined amount of money for a preferred object in a real-world setting.</p> <p>MA.912.F.1.Pa.b Indicate desire to exchange a predetermined amount of money for a preferred object in a real-world situation.</p>

Standard 2: Net Present and Net Future Value (NPV and NFV)

	Benchmark Code	Benchmark
	MA.912.F.2.1	Calculate the future value of a given amount of money, with and without technology.
	MA.912.F.2.2	Calculate the present value of a certain amount of money for a given length of time in the future, with and without technology.
	MA.912.F.2.3	Use a consumer price index to express dollars in constant terms, with and without technology.
	MA.912.F.2.4	Calculate the present value of an income stream, with and without technology.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
MA.912.F.2.In.a Identify situations that affect cost of living, such as inflation, wages, and location.	MA.912.F.2.Su.a Identify examples of costs that have changed over time.	MA.912.F.2.Pa.a Imitate a model to exchange a predetermined amount of money for a preferred object in real-world situations. MA.912.F.2.Pa.b Exchange a predetermined amount of money to purchase desired items in real-world situations.

Standard 3: Loans and Financing

Students are familiar with and can describe the advantages and disadvantages of short-term purchases, long-term purchases, and mortgages.

Benchmark Code	Benchmark
MA.912.F.3.1	Compare the advantages and disadvantages of using cash versus a credit card.
MA.912.F.3.2	Analyze credit scores and reports.
MA.912.F.3.3	Calculate the finance charges and total amount due on a credit card bill.
MA.912.F.3.4	Compare the advantages and disadvantages of deferred payments.
MA.912.F.3.5	Calculate deferred payments.
MA.912.F.3.6	Calculate total cost of purchasing consumer durables over time given different down payments, financing options, and fees.
MA.912.F.3.7	Calculate the following fees associated with a mortgage: <ul style="list-style-type: none">• discount points• origination fee• maximum brokerage fee on a net or gross loan• documentary stamps• prorated expenses (interest, county and/or city property taxes, and mortgage on an assumed mortgage)
MA.912.F.3.8	Substitute to solve a variety of mortgage formulas, including but not limited to Front End Ratio, Total Debt-to-Income Ratio, Loan-to-Value Ratio (LTV), Combined Loan-to-Value Ratio (CLTV), and Amount of Interest Paid Over the Life of a Loan.
MA.912.F.3.9	Calculate the total amount to be paid over the life of a fixed rate loan.
MA.912.F.3.10	Calculate the effects on the monthly payment in the change of interest rate based on an adjustable rate mortgage.
MA.912.F.3.11	Calculate the final pay out amount for a balloon mortgage.
MA.912.F.3.12	Compare the cost of paying a higher interest rate and lower points versus a lower interest rate and more points.
MA.912.F.3.13	Calculate the total amount paid for the life of a loan for a house including the down payment, points, fees, and interest.
MA.912.F.3.14	Compare the total cost for a set purchase price using a fixed rate, adjustable rate, and a balloon mortgage.
MA.912.F.3.15	Interpret the legal description using the metes and bounds; lot and block (plat); government survey; and monument methods.
MA.912.F.3.16	Estimate real property value using the sales comparison approach, cost-depreciation approach, or the income capitalization approach.
MA.912.F.3.17	Compare interest rate calculations and annual percentage rate calculations to distinguish between the two rates.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.912.F.3.In.a Identify and use wise consumer strategies for cash purchases.</p> <p>MA.912.F.3.In.b Identify advantages and disadvantages of using alternate cash forms for payment, such as checks, gift cards, debit cards, and credit cards.</p> <p>MA.912.F.3.In.c Identify finance charges as extra amounts added to cost of items that are not paid for on time.</p> <p>MA.912.F.3.In.d Recognize that deferred payments result in extra charges, such as increased interest rates.</p> <p>MA.912.F.3.In.e Identify reasons for paying bills on time and the effects of late payments or nonpayment.</p> <p>MA.912.F.3.In.f Identify resources and strategies for purchasing costly items, such as a car and house.</p>	<p>MA.912.F.3.Su.a Use wise consumer strategies for paying with cash.</p> <p>MA.912.F.3.Su.b Identify examples of alternate forms of payment, including debit cards, checks, gift cards, and credit cards.</p> <p>MA.912.F.3.Su.c Identify the effects of not paying bills on time.</p>	<p>MA.912.F.3.Pa.a Use predetermined amount of money to pay for an item in familiar purchasing situations.</p>

Standard 4: Individual Financial and Investment Planning

	Benchmark Code	Benchmark
	MA.912.F.4.1	Develop personal budgets that fit within various income brackets.
	MA.912.F.4.2	Explain cash management strategies including debit accounts, checking accounts, and savings accounts.
	MA.912.F.4.3	Calculate net worth.
	MA.912.F.4.4	Establish a plan to pay off debt.
	MA.912.F.4.5	Develop and apply a variety of strategies to use tax tables, determine, calculate, and complete yearly federal income tax.
	MA.912.F.4.6	Compare different insurance options and fees.
	MA.912.F.4.7	Compare and contrast the role of insurance as a device to mitigate risk and calculate expenses of various options.
	MA.912.F.4.8	Collect, organize, and interpret data to determine an effective retirement savings plan to meet personal financial goals.
	MA.912.F.4.9	Calculate, compare, and contrast different types of retirement plans, including IRAs, ROTH accounts, and annuities.
	MA.912.F.4.10	Analyze diversification in investments.
	MA.912.F.4.11	Purchase stock with a set amount of money and follow the process through gains, losses, and selling.
	MA.912.F.4.12	Compare and contrast income from purchase of common stock, preferred stock, and bonds.
	MA.912.F.4.13	Given current exchange rates be able to convert from one form of currency to another.
	MA.912.F.4.14	Use data to compare historical rates of return on investments with investment claims to make informed decisions and identify potential fraud.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.912.F.4.In.a Create a personal budget that fits take-home income after taxes.</p> <p>MA.912.F.4.In.b Use real-world strategies needed to manage personal income.</p> <p>MA.912.F.4.In.c Use strategies to determine how much sales and income tax must be paid in real-world situations.</p> <p>MA.912.F.4.In.d Identify reliable sources to assist with personal money management, tax preparation, and financial decisions.</p> <p>MA.912.F.4.In.e Identify purposes of different types of insurance, such as health, automobile, tenant, and life_ insurance.</p>	<p>MA.912.F.4.Su.a Distinguish between income and expenses.</p> <p>MA.912.F.4.Su.b Identify a personal budget that fits take-home income after taxes.</p> <p>MA.912.F.4.Su.c Identify additional charges, such as sales tax and service fees that may change the original cost of an item.</p> <p>MA.912.F.4.Su.d Identify reliable sources of assistance for personal money management and financial decisions.</p> <p>MA.912.F.4.Su.e Identify different types of insurance, such as health, automobile, and life insurance.</p>	<p>MA.912.F.4.Pa.a Use a money card or envelope with a predetermined amount of money to purchase a desired item in a real-world situation.</p> <p>MA.912.F.4.Pa.b Identify familiar items or services that have a cost.</p>

Standard 5: Economic Concepts

Benchmark Code	Benchmark
MA.912.F.5.1	Demonstrate how price and quantity demanded relate, how price and quantity supplied relate, and how price changes or price controls affect distribution and allocation in the economy.
MA.912.F.5.2	Use basic terms and indicators associated with levels of economic performance and the state of the economy.

Geometry

Body of Knowledge

MA.	912.	G.	1.	1
Subject	Grade Level	Body of Knowledge	Standard	Benchmark

Access Points Coding Scheme

MA.	912.	G.	1.	In.a
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Access Point

Access Points Key:

In ~ Independent

Su ~ Supported

Pa ~ Participatory

GEOMETRY BODY OF KNOWLEDGE

Standard 1: Points, Lines, Angles, and Planes

Students understand geometric concepts, applications, and their representations with coordinate systems. They find lengths and midpoints of line segments, slopes, parallel and perpendicular lines, and equations of lines. Using a compass and straightedge, patty paper, a drawing program or other techniques, students also construct lines and angles, explaining and justifying the processes they use.

	Benchmark Code	Benchmark
✳	MA.912.G.1.1	Find the lengths and midpoints of line segments in two-dimensional coordinate systems.
	MA.912.G.1.2	Construct congruent segments and angles, angle bisectors, and parallel and perpendicular lines using a straight edge and compass or a drawing program, explaining and justifying the process used.
✳	MA.912.G.1.3	Identify and use the relationships between special pairs of angles formed by parallel lines and transversals.
✳	MA.912.G.1.4	Use coordinate geometry to find slopes, parallel lines, perpendicular lines, and equations of lines.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.912.G.1.In.a Find the length and midpoint of line segments in real-world situations.</p> <p>MA.912.G.1.In.b Locate angles formed when a line intersects two parallel lines and classify the angles as obtuse, acute, or right angles.</p> <p>MA.912.G.1.In.c Locate and identify points on coordinate planes, such as line graphs or maps, using ordered pairs of numbers.</p>	<p>MA.912.G.1.Su.a Determine the midpoint of a line.</p> <p>MA.912.G.1.Su.b Differentiate between intersecting and parallel lines.</p> <p>MA.912.G.1.Su.c Match types of angles, such as obtuse, acute, and right angles, using physical models and drawings.</p> <p>MA.912.G.1.Su.d Locate specified points on a coordinate plane, such as a simple map represented on a grid.</p>	<p>MA.912.G.1.Pa.a Respond to a prompt to identify a line.</p> <p>MA.912.G.1.Pa.b Use a line to complete real-world activities.</p> <p>MA.912.G.1.Pa.c Follow directional instructions in two or more real-world activities.</p> <p>MA.912.G.1.Pa.d Place familiar objects in two or more designated locations in real-world activities.</p>

Standard 2: Polygons

Students identify and describe polygons (triangles, quadrilaterals, pentagons, hexagons, etc.), using terms such as regular, convex, and concave. They find measures of angles, sides, perimeters, and areas of polygons, justifying their methods. They apply transformations to polygons. They relate geometry to algebra by using coordinate geometry to determine transformations. Students use algebraic reasoning to determine congruence, similarity, and symmetry. Students create and verify tessellations of the plane using polygons.

	Benchmark Code	Benchmark
✱	MA.912.G.2.1	Identify and describe convex, concave, regular, and irregular polygons.
✱	MA.912.G.2.2	Determine the measures of interior and exterior angles of polygons, justifying the method used.
✱	MA.912.G.2.3	Use properties of congruent and similar polygons to solve mathematical or real-world problems.
✱	MA.912.G.2.4	Apply transformations (translations, reflections, rotations, dilations, and scale factors) to polygons to determine congruence, similarity, and symmetry.0 Know that images formed by translations, reflections, and rotations are congruent to the original shape. Create and verify tessellations of the plane using polygons.
✱	MA.912.G.2.5	Explain the derivation and apply formulas for perimeter and area of polygons (triangles, quadrilaterals, pentagons, etc.).
✱	MA.912.G.2.6	Use coordinate geometry to prove properties of congruent, regular and similar polygons, and to perform transformations in the plane.
✱	MA.912.G.2.7	Determine how changes in dimensions affect the perimeter and area of common geometric figures.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.912.G.2.In.a Determine if polygons have all sides and angles equal (regular) or have sides or angles that are not equal (irregular) using physical and visual models.</p> <p>MA.912.G.2.In.b Use tools to measure angles including 45° and 90°.</p> <p>MA.912.G.2.In.c Identify triangles and rectangles that are the same shape and size (congruent) and same shape but not same size (similar) using physical and visual models.</p> <p>MA.912.G.2.In.d Use physical and visual models to show that a change in orientation, such as turns (rotations), slides (translations), and flips (reflections), does not change the size or shape of a polygon.</p> <p>MA.912.G.2.In.e Find the perimeter and area of rectangles to solve real-world problems.</p> <p>MA.912.G.2.In.f Identify the effects of changes in the lengths of sides on the perimeter and area of rectangles using visual models to solve real-world problems.</p>	<p>MA.912.G.2.Su.a Identify polygons with all sides and angles equal (regular) in the environment.</p> <p>MA.912.G.2.Su.b Use a model of a right triangle to compare the size of angles, such as acute, obtuse, and right angles.</p> <p>MA.912.G.2.Su.c Match triangles and rectangles that are same shape, but different size (similar) using physical and visual models.</p> <p>MA.912.G.2.Su.d Match identical polygons in different positions including turns (rotations), slides (translations), and flips (reflections) using physical models.</p> <p>MA.912.G.2.Su.e Solve real-world problems involving perimeter using visual models.</p> <p>MA.912.G.2.Su.f Solve real-world problems to find area of a rectangle to identify total square units using visual models.</p> <p>MA.912.G.2.Su.g Identify the effect of changes in the lengths of sides of rectangles on perimeter using physical and</p>	<p>MA.912.G.2.Pa.a Respond to a prompt to identify objects or pictures with polygons.</p> <p>MA.912.G.2.Pa.b Match two or more objects with polygons based on a given feature to complete tasks in real-world activities.</p> <p>MA.912.G.2.Pa.c Identify objects, pictures, or signs with polygons to complete real-world activities.</p>

Standard 3: Quadrilaterals

Students classify and understand relationships among quadrilaterals (rectangle, parallelogram, kite, etc.). They relate geometry to algebra by using coordinate geometry to determine regularity, congruence, and similarity. They use properties of congruent and similar quadrilaterals to solve problems involving lengths and areas, and prove theorems involving quadrilaterals.

	Benchmark Code	Benchmark
☀	MA.912.G.3.1	Describe, classify, and compare relationships among quadrilaterals including the square, rectangle, rhombus, parallelogram, trapezoid, and kite.
☀	MA.912.G.3.2	Compare and contrast special quadrilaterals on the basis of their properties.
☀	MA.912.G.3.3	Use coordinate geometry to prove properties of congruent, regular and similar quadrilaterals.
	MA.912.G.3.4	Prove theorems involving quadrilaterals

Access Points for Students with Significant Cognitive Disabilities

Independent:	Supported:	Participatory:
<p>MA.912.G.3.In.a Identify four-sided shapes (quadrilaterals), such as square, rectangle, rhombus, and diamond, in the environment using visual models.</p> <p>MA.912.G.3.In.b Use tools to identify shapes as having one set of opposite sides parallel and equal in length (parallelograms).</p>	<p>MA.912.G.3.Su.a Identify four-sided shapes (quadrilaterals), such as square, rectangle, and diamond, in the environment using physical and visual models.</p> <p>MA.912.G.3.Su.b Determine whether shapes are rectangular or square by measuring the sides.</p> <p>MA.912.G.3.Su.c Identify shapes with one set of opposite sides parallel and equal in length (parallelograms) in the environment using physical and visual models.</p>	<p>MA.912.G.3.Pa.a Respond to a prompt to identify objects or pictures with four-sided shapes (quadrilaterals), such as square, rectangle, or diamond.</p> <p>MA.912.G.3.Pa.b Match two or more objects with four-sided shapes (quadrilaterals), based on a given feature, to complete tasks in real-world activities.</p> <p>MA.912.G.3.Pa.c Identify objects, pictures, or signs with four-sided shapes (quadrilaterals) to complete real-world activities.</p>

Standard 4: Triangles

Students identify and describe various kinds of triangles (right, acute, scalene, isosceles, etc.). They define and construct altitudes, medians, and bisectors, and triangles congruent to given triangles. They prove that triangles are congruent or similar and use properties of these triangles to solve problems involving lengths and areas. They relate geometry to algebra by using coordinate geometry to determine regularity, congruence, and similarity. They understand and apply the inequality theorems of triangles.

	Benchmark Code	Benchmark
✱	MA.912.G.4.1	Classify, construct, and describe triangles that are right, acute, obtuse, scalene, isosceles, equilateral, and equiangular.
✱	MA.912.G.4.2	Define, identify, and construct altitudes, medians, angle bisectors, perpendicular bisectors, orthocenter, centroid, incenter, and circumcenter.
	MA.912.G.4.3	Construct triangles congruent to given triangles.
✱	MA.912.G.4.4	Use properties of congruent and similar triangles to solve problems involving lengths and areas.
✱	MA.912.G.4.5	Apply theorems involving segments divided proportionally.
✱	MA.912.G.4.6	Prove that triangles are congruent or similar and use the concept of corresponding parts of congruent triangles.
✱	MA.912.G.4.7	Apply the inequality theorems: triangle inequality, inequality in one triangle, and the Hinge Theorem.
	MA.912.G.4.8	Use coordinate geometry to prove properties of congruent, regular, and similar triangles.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.912.G.4.In.a Discriminate between triangles that have equal sides and angles (equilateral), triangles that have two equal sides and two equal angles (isosceles), and triangles that have one right angle (right triangle) using visual and physical models.</p> <p>MA.912.G.4.In.b Identify the height (altitude) in equilateral and isosceles triangles using physical and visual models.</p> <p>MA.912.G.4.In.c Measure sides and angles of triangles to determine whether triangles are the same size and shape (congruent) or the same shape but different size (similar).</p>	<p>MA.912.G.4.Su.a Discriminate between triangles that have equal sides and angles (equilateral) and triangles that have two equal sides and two equal angles (isosceles) using physical models.</p> <p>MA.912.G.4.Su.b Measure the length of sides of triangles to verify if two triangles are the same shape and size (congruent).</p>	<p>MA.912.G.4.Pa.a Respond to a prompt to identify objects or pictures with a triangle.</p> <p>MA.912.G.4.Pa.b Match two or more objects with a triangle based on a given feature to complete tasks in real-world activities.</p> <p>MA.912.G.4.Pa.c Identify objects, pictures, or signs with a triangle to complete real-world activities.</p>

Standard 5: Right Triangles

Students apply the Pythagorean Theorem to solving problems, including those involving the altitudes of right triangles and triangles with special angle relationships. Students use special right triangles to solve problems using the properties of triangles.

	Benchmark Code	Benchmark
✱	MA.912.G.5.1	Prove and apply the Pythagorean Theorem and its converse.
	MA.912.G.5.2	State and apply the relationships that exist when the altitude is drawn to the hypotenuse of a right triangle.
✱	MA.912.G.5.3	Use special right triangles ($30^\circ - 60^\circ - 90^\circ$ and $45^\circ - 45^\circ - 90^\circ$) to solve problems.
	MA.912.G.5.4	Solve real-world problems involving right triangles.

Access Points for Students with Significant Cognitive Disabilities

Independent:	Supported:	Participatory:
<p>MA.912.G.5.In.a Compare the length of the straight sides in a right triangle with the length of the side opposite the right angle (hypotenuse).</p> <p>MA.912.G.5.In.b Identify examples of different kinds of right triangles in the environment using physical models.</p>	<p>MA.912.G.5.Su.a Identify right triangles in the environment using physical models.</p> <p>MA.912.G.5.Su.b Locate the right angle of right triangles and side opposite the right angle (hypotenuse) in the environment.</p>	<p>MA.912.G.5.Pa.a Respond to a prompt to identify objects or pictures with a right triangle.</p> <p>MA.912.G.5.Pa.b Identify objects, pictures, or signs with a right triangle to complete familiar real-world activities.</p>

Standard 6: Circles

Students define and understand ideas related to circles (radius, tangent, chord, etc.). They perform constructions and prove theorems related to circles. They find measures of arcs and angles related to them, as well as measures of circumference and area. They relate geometry to algebra by finding the equation of a circle in the coordinate plane.

	Benchmark Code	Benchmark
	MA.912.G.6.1	Determine the center of a given circle. Given three points not on a line, construct the circle that passes through them. Construct tangents to circles. Circumscribe and inscribe circles about and within triangles and regular polygons.
✱	MA.912.G.6.2	Define and identify: circumference, radius, diameter, arc, arc length, chord, secant, tangent and concentric circles.
	MA.912.G.6.3	Prove theorems related to circles, including related angles, chords, tangents, and secants.
✱	MA.912.G.6.4	Determine and use measures of arcs and related angles (central, inscribed, and intersections of secants and tangents).
✱	MA.912.G.6.5	Solve real-world problems using measures of circumference, arc length, and areas of circles and sectors.
✱	MA.912.G.6.6	Given the center and the radius, find the equation of a circle in the coordinate plane or given the equation of a circle in center-radius form, state the center and the radius of the circle.
	MA.912.G.6.7	Given the equation of a circle in center-radius form or given the center and the radius of a circle, sketch the graph of the circle.

Access Points for Students with Significant Cognitive Disabilities

Independent:	Supported:	Participatory:
<p>MA.912.G.6.In.a Identify and describe the circumference, arc, diameter, and radius of circles using physical and visual models.</p> <p>MA.912.G.6.In.b Measure the diameter and radius of circles to solve real-world problems.</p> <p>MA.912.G.6.In.c Determine the relationship between a semi-circle and a circle.</p>	<p>MA.912.G.6.Su.a Identify the circumference, arc, and diameter of circles in real-world situations.</p> <p>MA.912.G.6.Su.b Compare the circumference and diameter of circles in real-world situations.</p> <p>MA.912.G.6.Su.c Identify examples of semi-circles in the environment.</p>	<p>MA.912.G.6.Pa.a Respond to a prompt to identify objects or pictures with a circle.</p> <p>MA.912.G.6.Pa.b Match two or more objects with a circle based on a given feature to complete tasks in real-world activities.</p> <p>MA.912.G.6.Pa.c Identify objects, pictures, or signs with a circle to complete real-world activities.</p>

Standard 7: Polyhedra and Other Solids

Students describe and make regular and nonregular polyhedra (cube, pyramid, tetrahedron, octahedron, etc.). They explore relationships among the faces, edges, and vertices of polyhedra. They describe sets of points on spheres, using terms such as great circle. They describe symmetries of solids and understand the properties of congruent and similar solids.

	Benchmark Code	Benchmark
✱	MA.912.G.7.1	Describe and make regular, non-regular, and oblique polyhedra and sketch the net for a given polyhedron and vice versa.
	MA.912.G.7.2	Describe the relationships between the faces, edges, and vertices of polyhedra.
	MA.912.G.7.3	Identify, sketch, and determine areas and/or perimeters of cross sections of three-dimensional solids.
✱	MA.912.G.7.4	Identify chords, tangents, radii, and great circles of spheres.
✱	MA.912.G.7.5	Explain and use formulas for lateral area, surface area, and volume of three-dimensional solids.
✱	MA.912.G.7.6	Identify and use properties of congruent and similar three-dimensional solids.
✱	MA.912.G.7.7	Determine how changes in dimensions affect the surface area and volume of common three-dimensional geometric solids.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.912.G.7.In.a Identify and describe three-dimensional solids, including sphere, cylinder, rectangular prism, and cone in the environment using mathematical names.</p> <p>MA.912.G.7.In.b Identify a line that divides a sphere in half.</p> <p>MA.912.G.7.In.c Measure rectangular prisms to find the volume using the literal formula: length x width x height.</p> <p>MA.912.G.7.In.d Compare volumes of three-dimensional solids using physical and visual models.</p> <p>MA.912.G.7.In.e Identify the effect of changes in the lengths of the sides of cubes or rectangular prisms on the volume using physical and visual models.</p>	<p>MA.912.G.7.Su.a Identify three-dimensional solids, such as sphere, cylinder, cube, and cone in the environment, when given the common name.</p> <p>MA.912.G.7.Su.b Compare volumes of three-dimensional solids in real-world situations</p> <p>MA.912.G.7.Su.c Identify that changes in the lengths of sides of cubes or rectangular prisms will make the volume smaller or larger using physical models.</p>	<p>MA.912.G.7.Pa.a Respond to a prompt to identify objects or pictures that are three-dimensional solids.</p> <p>MA.912.G.7.Pa.b Match two or more objects with three-dimensional solids based on a given feature to complete tasks in real-world activities.</p> <p>MA.912.G.7.Pa.c Identify objects or pictures with given three-dimensional solids to complete real-world activities.</p>

Standard 8: Mathematical Reasoning and Problem Solving

In a general sense, mathematics is problem solving. In all mathematics, students use problem-solving skills: they choose how to approach a problem, they explain their reasoning, and they check their results. At this level, students apply these skills to making conjectures, using axioms and theorems, constructing logical arguments, and writing geometric proofs. They also learn about inductive and deductive reasoning and how to use counterexamples to show that a general statement is false.

	Benchmark Code	Benchmark
	MA.912.G.8.1	Analyze the structure of Euclidean geometry as an axiomatic system. Distinguish between undefined terms, definitions, postulates and theorems.
	MA.912.G.8.2	Use a variety of problem-solving strategies, such as drawing a diagram, making a chart, guess-and-check, solving a simpler problem, writing an equation, and working backwards.
✱	MA.912.G.8.3	Determine whether a solution is reasonable in the context of the original situation.
✱	MA.912.G.8.4	Make conjectures with justifications about geometric ideas. Distinguish between information that supports a conjecture and the proof of a conjecture.
	MA.912.G.8.5	Write geometric proofs, including proofs by contradiction and proofs involving coordinate geometry. Use and compare a variety of ways to present deductive proofs, such as flow charts, paragraphs, two-column, and indirect proofs.
	MA.912.G.8.6	Perform basic constructions using straightedge and compass, and/or drawing programs describing and justifying the procedures used. Distinguish between sketching, constructing and drawing geometric figures.

Access Points for Students with Significant Cognitive Disabilities

Independent:	Supported:	Participatory:
<p>MA.912.G.8.In.a Use problem-solving strategies, including visual and physical models and tools, for solving real-world problems involving geometry concepts and skills.</p> <p>MA.912.G.8.In.b Use estimation and resources to determine if solutions to problems involving geometry concepts and skills are reasonable.</p>	<p>MA.912.G.8.Su.a Use given problem-solving strategies, including using visual or physical models, for solving real-world problems involving geometry concepts and skills.</p> <p>MA.912.G.8.Su.b Use resources such as calculators and conversion charts to verify accuracy of solutions to problems involving geometry concepts.</p>	<p>MA.912.G.8.Pa.a Solve real-world problems involving objects with two-dimensional shapes by following established procedures.</p> <p>MA.912.G.8.Pa.b. Solve real-world problems involving objects with three-dimensional shapes by following established procedures.</p>

Probability

Body of Knowledge

MA.	912.	P.	1.	1
Subject	Grade Level	Body of Knowledge	Standard	Benchmark

Access Points Coding Scheme

MA.	912.	P.	1.	In.a
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Access Point

Access Points Key:

In ~ Independent

Su ~ Supported

Pa ~ Participatory

PROBABILITY BODY OF KNOWLEDGE

Standard 1: Counting Principals

Students understand the counting principle, permutations, and combinations and use them to solve problems.

	Benchmark Code	Benchmark
✶	MA.912.P.1.1	Use counting principles, including the addition and the multiplication principles, to determine size of finite sample spaces and probabilities of events in those spaces.
	MA.912.P.1.2	Use formulas for permutations and combinations to count outcomes and determine probabilities of events.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
MA.912.P.1.In.a Use visual representations such as drawings or charts to show possible combinations with three elements.	MA.912.P.1.Su.a Use physical representations to show possible combinations with two elements.	MA.912.P.1.Pa.a Solve problems by selecting preferred or necessary item given three or more options in different activities in multiple settings.

Standard 2: Determine Probabilities

Students develop rules for finding probabilities of combined and complementary events. They understand and use conditional probability and the related Bayes' Theorem.

	Benchmark Code	Benchmark
✱	MA.912.P.2.1	Determine probabilities of complementary events, and calculate odds for and against the occurrence of events.
✱	MA.912.P.2.2	Determine probabilities of independent events.
	MA.912.P.2.3	Understand and use the concept of conditional probability, including: understanding how conditioning affects the probability of events; finding conditional probabilities from a two-way frequency table.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
MA.912.P.2.In.a Identify if given outcomes for events in real-world situations are certain, likely, or impossible based on data in a graph or chart.	MA.912.P.2.Su.a Predict the likely outcome of a simple experiment or event by selecting from three choices of outcomes.	MA.912.P.2.Pa.a Use a daily schedule to anticipate transition from two or more activities to the next activity in real-world settings.

Standard 3: Probability Distributions

Students investigate probability distributions and calculate and interpret their means and variances. They use and apply the normal distribution, including using the central limit theorem.

	Benchmark Code	Benchmark
	MA.912.P.3.1	Determine probabilities of events from distributions, including: <ul style="list-style-type: none"> • discrete uniform (all outcomes in a finite set equally likely) • binomial • normal • exponential
	MA.912.P.3.2	Determine the mean and variance of distributions, including: <ul style="list-style-type: none"> • discrete uniform (all outcomes in a finite set equally likely) • binomial • normal • exponential
	MA.912.P.3.3	Apply the properties of the normal distribution.
	MA.912.P.3.4	Apply the Central Limit Theorem to determine the probability that a sample mean will be in a certain interval.

Statistics

Body of Knowledge

MA.	912.	S.	1.	1
Subject	Grade Level	Body of Knowledge	Standard	Benchmark

Access Points Coding Scheme

MA.	912.	S.	1.	In.a
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Access Point

Access Points Key:

In ~ Independent

Su ~ Supported

Pa ~ Participatory

STATISTICS BODY OF KNOWLEDGE

Standard 1: Formulating Questions

Students learn to define appropriate questions for research, and to pose questions in a form that can be answered by collecting and analyzing data.

	Benchmark Code	Benchmark
	MA.912.S.1.1	Formulate an appropriate research question to be answered by collecting data or performing an experiment.
	MA.912.S.1.2	Determine appropriate and consistent standards of measurement for the data to be collected in a survey or experiment.

Standard 2: Data Collection

Students learn key methods for collecting data and basic sampling principles.

	Benchmark Code	Benchmark
	MA.912.S.2.1	Compare the difference between surveys, experiments, and observational studies, and what types of questions can and cannot be answered by a particular design.
	MA.912.S.2.2	Apply the definition of random sample and basic types of sampling, including representative samples, stratified samples, censuses.
✶	MA.912.S.2.3	Identify sources of bias, including sampling and non-sampling errors.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
MA.912.S.2.In.a Identify when data from part of a group (sample) should not be used to make predictions regarding the whole group.	MA.912.S.2.Su.a Identify problems with inaccurate counting when collecting data and use strategies to correct mistakes.	MA.912.S.2.Pa.a Identify a missing part of objects, pictures, or symbols in real-world tasks.

Standard 3: Summarizing Data (Descriptive Statistics)

Students learn to work with summary measures of sets of data, including measures of the center, spread, and strength of relationship between variables. Students learn to distinguish between different types of data and to select the appropriate visual form to present different types of data.

	Benchmark Code	Benchmark
✱	MA.912.S.3.1	Read and interpret data presented in various formats. Determine whether data is presented in appropriate format, and identify possible corrections. Formats to include: <ul style="list-style-type: none">• bar graphs• line graphs• stem and leaf plots• circle graphs• histograms• box and whiskers plots• scatter plots• cumulative frequency (ogive) graphs
✱	MA.912.S.3.2	Collect, organize, and analyze data sets, determine the best format for the data and present visual summaries from the following: <ul style="list-style-type: none">• bar graphs• line graphs• stem and leaf plots• circle graphs• histograms• box and whisker plots• scatter plots• cumulative frequency (ogive) graphs
✱	MA.912.S.3.3	Calculate and interpret measures of the center of a set of data, including mean, median, and weighted mean, and use these measures to make comparisons among sets of data.
	MA.912.S.3.4	Calculate and interpret measures of variance and standard deviation. Use these measures to make comparisons among sets of data.
✱	MA.912.S.3.5	Calculate and interpret the range and quartiles of a set of data.
	MA.912.S.3.6	Use empirical rules (e.g. 68-95-99.7 rule) to estimate spread of distributions and to make comparisons among sets of data.
	MA.912.S.3.7	Calculate the correlation coefficient of a set of paired data, and interpret the coefficient as a measure of the strength and direction of the relationship between the variables.
	MA.912.S.3.8	Determine whether a data distribution is symmetric or skewed based on an appropriate graphical presentation of the data.
	MA.912.S.3.9	Identify outliers in a set of data based on an appropriate graphical presentation of the data, and describe the effect of outliers on the mean, median, and range of the data.

Access Points for Students with Significant Cognitive Disabilities

<i>Independent:</i>	<i>Supported:</i>	<i>Participatory:</i>
<p>MA.912.S.3.In.a Describe information in bar graphs, circle graphs, and single-line graphs representing data from real-world situations.</p> <p>MA.912.S.3.In.b Collect data and display in single-line graphs, circle graphs, and bar graphs.</p> <p>MA.912.S.3.In.c Determine the mode by identifying the number that occurs most often and the mean by finding the average.</p> <p>MA.912.S.3.In.d Calculate the range and median for data from real-world situations.</p>	<p>MA.912.S.3.Su.a Identify information in simple pictographs and bar graphs that represent data from real-world situations</p> <p>MA.912.S.3.Su.b Organize data in pictographs and bar graphs and identify the labels for categories.</p> <p>MA.912.S.3.Su.c Identify the number that occurs most frequently (mode) in a set of data with up to nine numbers.</p> <p>MA.912.S.3.Su.d Find the difference between the largest and smallest numbers in a set of data (range) and the median in a real-world situation.</p>	<p>MA.912.S.3.Pa.a Identify objects, pictures, or symbols with a given feature to represent data related to a real-world activity.</p> <p>MA.912.S.3.Pa.b Identify quantity in data sets of 5 or more by counting objects, pictures, or symbols and identify which category has more, less, or none.</p>

Standard 4: Analyzing Data

Students learn to use simulations of standard sampling distributions to determine confidence levels and margins of error. They develop measures of association between two numerical or categorical variables. They can use technological tools to find equations of regression lines and correlation coefficients.

	Benchmark Code	Benchmark
	MA.912.S.4.1	Explain and interpret the concepts of confidence level and “margin of error”.
	MA.912.S.4.2	Use a simulation to approximate sampling distributions for the mean, using repeated sampling simulations from a given population.
	MA.912.S.4.3	Apply the Central Limit Theorem to solve problems.
	MA.912.S.4.4	Approximate confidence intervals for means using simulations of the distribution of the sample mean.
	MA.912.S.4.5	Find the equation of the least squares regression line for a set of data.

Standard 5: Interpreting Results

Students gather data and determine confidence intervals to make inferences about means and use hypothesis tests to make decisions. They learn to use data to approximate p-values and to determine whether correlations between variables are significant.

	Benchmark Code	Benchmark
	MA.912.S.5.1	Analyze the relationship between confidence level, margin of error and sample size.
	MA.912.S.5.2	Apply the general principles of hypothesis testing.
	MA.912.S.5.3	Explain and identify the following: null hypothesis, alternative hypotheses, Type I error, and Type II error.
	MA.912.S.5.4	Explain the meaning of <i>p-value</i> and its role in hypothesis testing.
	MA.912.S.5.5	Perform hypothesis tests of means and proportions for large samples, using simulations to determine whether a sample mean (proportion) has a low likelihood of occurring.
	MA.912.S.5.6	Interpret the results of hypothesis tests of means and proportions, and make decisions based on p-values of test.
	MA.912.S.5.7	Use simulations to approximate the p-value of a correlation coefficient, and use the results to determine whether the correlation between two variables is significant.
	MA.912.S.5.8	Use a regression line equation to make predictions.
	MA.912.S.5.9	Interpret the coefficient of determination, r^2 , for a least-squares regression.

Trigonometry

Body of Knowledge

MA.	912.	T.	1.	1
Subject	Grade Level	Body of Knowledge	Standard	Benchmark

Access Points Coding Scheme

MA.	912.	T.	1.	In.a
Subject	Grade Level	Body of Knowledge	Big Idea / Supporting Idea	Access Point

Access Points Key:

In ~ Independent

Su ~ Supported

Pa ~ Participatory

TRIGONOMETRY BODY OF KNOWLEDGE

Standard 1: Trigonometric Functions

Students extend the definitions of the trigonometric functions beyond right triangles using the unit circle and they measure angles in radians as well as degrees. They draw and analyze graphs of trigonometric functions (including finding period, amplitude, and phase shift) and use them to solve word problems. They define and graph inverse trigonometric functions and determine values of both trigonometric and inverse trigonometric functions.

	Benchmark Code	Benchmark
	MA.912.T.1.1	Convert between degree and radian measures.
	MA.912.T.1.2	Define and determine sine and cosine using the unit circle.
	MA.912.T.1.3	State and use exact values of trigonometric functions for special angles, i.e. multiples of $\frac{\pi}{6}$ and $\frac{\pi}{4}$ (degree and radian measures)
	MA.912.T.1.4	Find approximate values of trigonometric and inverse trigonometric functions using appropriate technology.
	MA.912.T.1.5	Make connections between right triangle ratios, trigonometric functions, and circular functions.
	MA.912.T.1.6	Define and graph trigonometric functions using domain, range, intercepts, period, amplitude, phase shift, vertical shift, and asymptotes with and without the use of graphing technology.
	MA.912.T.1.7	Define and graph inverse trigonometric relations and functions.
	MA.912.T.1.8	Solve real-world problems involving applications of trigonometric functions using graphing technology when appropriate.

Standard 2: Trigonometry in Triangles

Students understand how the trigonometric functions relate to right triangles and solve word problems involving right and oblique triangles. They understand and apply the laws of sines and cosines. They use trigonometry to find the area of triangles.

	Benchmark Code	Benchmark
✱	MA.912.T.2.1	Define and use the trigonometric ratios (sine , cosine , tangent , cotangent, secant, and cosecant) in terms of angles of right triangles.
✱	MA.912.T.2.2	Solve real-world problems involving right triangles using technology when appropriate.
	MA.912.T.2.3	Apply the laws of sines and cosines to solve real-world problems using technology.
	MA.912.T.2.4	Use the area of triangles given two sides and an angle or three sides to solve real-world problems.

Access Points for Students with Significant Cognitive Disabilities

Independent:	Supported:	Participatory:
<p>MA.912.T.2.In.a Compare the length of the straight sides in a right triangle with the length of the side opposite the right angle (hypotenuse) by measuring the sides.</p> <p>MA.912.T.2.In.b Identify and construct right triangles to solve real-world problems.</p>	<p>MA.912.T.2.Su.a Measure the sides of a right triangle to determine which side is the longest.</p> <p>MA.912.T.2.Su.b Use right triangles to solve real-world problems.</p>	<p>MA.912.T.2.Pa.a Respond to objects, pictures, or signs with right triangles to complete familiar real-world activities.</p>

Standard 3: Trigonometric Identities and Equations

Students know basic trigonometric identities derived from definitions and use them to prove other identities. They use the sum, difference, double-angle, and half-angle formulas. They solve trigonometric equations and word problems using trigonometry.

	Benchmark Code	Benchmark
	MA.912.T.3.1	Verify the basic Pythagorean identities, e.g., $\sin^2 x + \cos^2 x = 1$, and show they are equivalent to the Pythagorean Theorem.
	MA.912.T.3.2	Use basic trigonometric identities to verify other identities and simplify expressions.
	MA.912.T.3.3	Use the sum and difference, half-angle and double-angle formulas for sine, cosine, and tangent, when formulas are provided.
	MA.912.T.3.4	Solve trigonometric equations and real-world problems involving applications of trigonometric equations using technology when appropriate.

Standard 4: Polar Coordinates and Trigonometric Form of Complex Numbers

Students define, use polar coordinates, and relate them to Cartesian coordinates. They translate equations in terms of Cartesian coordinates into polar coordinates and graph the resulting equations in the polar coordinate plane. They convert complex numbers from standard to trigonometric form, and vice-versa. They multiply complex numbers in trigonometric form and use De Moivre's Theorem.

	Benchmark Code	Benchmark
	MA.912.T.4.1	Define polar coordinates and relate polar coordinates to Cartesian coordinates with and without the use of technology.
	MA.912.T.4.2	Represent equations given in rectangular coordinates in terms of polar coordinates.
	MA.912.T.4.3	Graph equations in the polar coordinate plane with and without the use of graphing technology.
	MA.912.T.4.4	Define the trigonometric form of complex numbers, convert complex numbers to trigonometric form, and multiply complex numbers in trigonometric form.
	MA.912.T.4.5	Apply DeMoivre's Theorem to perform operations with complex numbers.

Standard 5: Mathematical Reasoning and Problem Solving

Students use a variety of strategies to solve problems. They develop and evaluate mathematical arguments and proofs.

	Benchmark Code	Benchmark
	MA.912.T.5.1	Use a variety of problem-solving strategies, such as drawing a diagram, guess-and-check, solving a simpler problem, examining simpler problems, and working backwards, and using technology when appropriate.
	MA.912.T.5.2	Decide whether a solution is reasonable in the context of the original situation.
	MA.912.T.5.3	Determine whether a given trigonometric statement is always, sometimes, or never true. Use the properties of the real numbers, order of operations, and trigonometric identities to justify the steps involved in verifying identities and solving equations.