Curriculum and Instruction
(Elementary Mathematics)

January 2008

Mathematics Crunch Time (Grades 3-5)

Compendium of Instructional Strategies for Grades 3-5

2007-2008 School Year

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Mathematics Crunch Time Strategies (Grades 3-5)

OVERVIEW

Curriculum and Instruction (Elementary Mathematics) is providing teachers with *Mathematics Crunch Time Strategies*, a tool to assist them in preparing students for success on the Florida Comprehensive Assessment Test (FCAT).

Items included in this document are:

1. Instructional Focal Points
2. Sunshine State Standards (SSS) Benchmarks Assessed and Item Formats
3. FCAT Item Format
4. FCAT Mathematics Scoring Rubrics
5. Hints for Students Taking the FCAT Mathematics Test
6. Tips on How to Answer the "Think, Solve, and Explain" Questions
7. General Test Taking Tips for Parents to Remember
8. What Parents Can Do to Support the Learning of Mathematics
9. Benefits of Parental Involvement

Teachers should continue to customize learning episodes based on data results. Instructional choices need to be based on grade level expectations and content limits. The level of emphasis made on the standards delineated by day on the *Instructional Focal Points* table will depend on what has already been taught, how was it taught, and what is the level of student mastery of the concepts taught to this point in the year.

Teachers need to consider which benchmarks have not been covered to this point. *Table 1: Compendium of Instructional Strategies for Grades 3-5* lists strategies by strand and standard that teachers may use to effectively teach mathematical concepts and generalizations. *Table 2: SSS Mathematics Benchmarks Assessed at Grades 3-5* provides a list of all annually assessed benchmarks. The content in tables 1 and 2 will help make the necessary instructional decisions in the mathematics crunch time.

Other resources for teachers and students include *FCAT Explorer*, a free resource offered via the Internet by the Florida Department of Education at http://www.fcatexplorer.com, or FCAT Sample Test booklets at http://fcat.fldoe.org/fcatsmpl.asp.

We hope that the development of this document facilitates the implementation of a successful Mathematics curriculum and instruction prior to the administration of FCAT 2008.

INSTRUCTIONAL FOCAL POINTS

Compendium of Instructional Strategies for Grades 3-5

The *Instructional Focal Points* is to be used as a companion to what is already in place at the school-sites when teachers consider readily available options to teach or, in some cases, re-teach "hard to understand" concepts.

Table 1: Instructional Focal Points lists some instructional strategies to be used when teaching mathematical concepts assessed on the FCAT.

Column One –Module: Numbers the modules.
Teachers should view the material to be covered as a general mathematics module and **NOT** as a daily sequence. Modules may be reviewed in different sequences. The concept(s) within the module and depth to which the content is cover is left to the discretion of the teacher. It is recommended to continue the district pacing guide and use the focal points as a bank of strategies to continue to intensify within the instructional period.

Column Two –
Standards: Contains the SSS mathematics standard for the strand labeled on the first row of the table.
Benchmark: Contains all the SSS mathematics benchmarks for the standard, with an * by the benchmark for which the grade 5 students will be required to complete a performance task item on the FCAT.
Instructional Strategies: Provides teachers with some strategies to intensify within the instructional period.

The Florida Department of Education has produced a document called ***FCAT Mathematics Lessons Learned: 2001–2005 Data Analyses and Instructional Implications***. This report is a comprehensive view of student achievement from 2001 to 2005. It analyzes the FCAT results and provides insights to identify and implement modifications in curriculum, instruction, and assessment. Florida Department of Education convened a task force of educators which included supervisors, resource teachers, school administrators, and curriculum specialists. This task force provided implications for instruction by grade level and standard within a given strand. We recommend reviewing those listed on table 1. For the full document, go to http://fcat.fldoe.org/pdf/FCAT07_LL_Math.pdf.

Shaded Row – Infusion of Strand A: Number Sense, Concepts, and Operations
Given that the understanding and making sense of numbers and gaining fluency in computation form the foundation of an elementary student's mathematical experience, *Strand A: Number Sense, Concepts, and Operations* standards have been infused within the days' modules where rich connections can take place. Teachers are again provided with some strategies to intensify within the instructional period.

Please note that in order to increase mathematical understanding and competencies, the mathematics ***process standards***- Problem Solving, Reasoning and Proof, Communication, Connections, and Representation- must be adopted as part of the daily curriculum.

INSTRUCTIONAL FOCAL POINTS

<table>
<tr><th colspan="3">Table 1: Compendium of Instructional Strategies for Grades 3-5
Source for Strategies: FCAT Mathematics Lessons Learned: 2001–2005 Data Analyses and Instructional Implications</th></tr>
<tr><td>MODULE</td><td colspan="2">STRAND B: MEASUREMENT</td></tr>
<tr><td rowspan="4">1</td><td>STANDARD</td><td>B1:
The student measures quantities in the real world and uses the measures to solve problems.</td></tr>
<tr><td>BENCHMARK(S)</td><td>MA.B.1.2.1
MA.B.1.2.2</td></tr>
<tr><td>INSTRUCTIONAL STRATEGIES</td><td>☐ Students in Grades 3 and 4 use analog clocks to practice solving elapsed-time problems that go both backward and forward in time.
☐ Students should practice problems that require using time intervals greater than two hours.
☐ Students in Grades 3–5 should continue to practice finding length, weight, mass, capacity, and volume through hands-on activities using real-world objects.</td></tr>
<tr><td colspan="2">Infusion of Strand A: Number Sense, Concepts and Operations
Standard 4: The student uses estimation in problem solving and computation.
Benchmark: MA.A.4.2.1* (Grade 5 students will be required to complete a performance task item on the FCAT for this benchmark.)
☐ Review estimation strategies that go beyond rounding (e.g., front end, clustering, grouping, and benchmarking).
☐ Try not interchangeably use estimation and rounding terminology so that students will not identify rounding as the only viable estimation strategy.</td></tr>
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INSTRUCTIONAL FOCAL POINTS

Table 1: Compendium of Instructional Strategies for Grades 3-5 Source for Strategies: ***FCAT Mathematics Lessons Learned: 2001–2005 Data Analyses and Instructional Implications***		
MODULE	**STRAND B: MEASUREMENT**	
2	**STANDARD**	**B2:** **The student compares, contrasts, and converts within systems measurement (both standard/ nonstandard and metric/ customary)**
	BENCHMARK(S)	**MA.B.2.2.1** **MA.B.2.2.2**
	INSTRUCTIONAL STRATEGIES	☐ Students should be given more opportunities to develop an awareness of the length of a kilometer and acquire additional practice performing conversions within the customary system of measurement, which includes conversions in multiple-step problems.
	Infusion of Strand A: Number Sense, Concepts and Operations **Standard 2: The student understands number systems.** **Benchmark(s): MA.A.2.2.1 and MA.A.2.2.2**	
	The *Lessons Learned* task force determined that students generally did well in this benchmark. ☐ Students should continue to work with decimals in place value charts.	

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INSTRUCTIONAL FOCAL POINTS

Table 1: Compendium of Instructional Strategies for Grades 3-5 Source for Strategies: *FCAT Mathematics Lessons Learned: 2001–2005 Data Analyses and Instructional Implications*		
MODULE	**STRAND B: MEASUREMENT**	
3	**STANDARD**	**B4:** **The student selects and uses appropriate units and instruments for measurement to achieve the degree of precision and accuracy required in real-world situations.**
	BENCHMARK(S)	**MA.B.4.2.1** **MA.B.4.2.2**
	INSTRUCTIONAL STRATEGIES	For Grade 4, ☐ Students should practice telling time to the minute and practice determining length measurements when neither endpoint is aligned with the zero on a ruler.
	Infusion of Strand A: Number Sense, Concepts and Operations **Standard 1: The student understands the different ways numbers are represented and used in the real world.** **Benchmark(s): MA.A.1.2.1, MA.A.1.2.2, MA.A.1.2.3, and MA.A.1.2.4**	
	☐ Students should be provided with more in-depth experience using fractions. This may include activities with manipulatives, games and puzzles, and visual aids using fraction circles, fraction bars, hundreds charts, and number lines. ☐ Review number lines in Grades 4 and 5 that include whole numbers, fractions, and decimals.	

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INSTRUCTIONAL FOCAL POINTS

Table 1: Compendium of Instructional Strategies for Grades 3-5 Source for Strategies: *FCAT Mathematics Lessons Learned: 2001–2005 Data Analyses and Instructional Implications*		
MODULE	**STRAND C: GEOMETRY AND SPATIAL SENSE**	
4	**STANDARD**	**C1:** **The student describes draws, identifies, and analyzes two- and three dimensional shapes.**
	BENCHMARK(S)	**MA.C.1.2.1**
	INSTRUCTIONAL STRATEGIES	For Grade 3, ☐ Teach vocabulary and shapes at the same time, not in isolation. ☐ Students should practice identifying similarities and differences between shapes and practice working with polygons having up to six sides. For Grade 4, ☐ Emphasize similarities and differences between shapes, types of angles, and polygons having up to eight sides. ☐ Students should practice with examples from everyday life to identify and reinforce geometric terms. For Grade 5, ☐ Students should be able to move beyond simply identifying shapes. ☐ Provide opportunities for students to create shapes based on verbal or written descriptions. These constructions can be created using manipulatives, such as straws, pipe cleaners, toothpicks, geo-boards, jump ropes, and rubber bands. For Grades 3–5, ☐ Provide students with experience in noting geometric shapes in the physical environment. ☐ Connect geometric principles to art in the classroom and in special area classes.

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INSTRUCTIONAL FOCAL POINTS

Table 1: Compendium of Instructional Strategies for Grades 3-5 Source for Strategies: *FCAT Mathematics Lessons Learned: 2001–2005 Data Analyses and Instructional Implications*		
MODULE	**STRAND C: GEOMETRY AND SPATIAL SENSE**	
5	**STANDARD**	**C2:** **The student visualizes and illustrates ways in which shapes can be combined, subdivided, and changed.**
	BENCHMARK(S)	**MA.C.2.2.1*** (Grade 5 students will be required to complete a performance task item on the FCAT for this benchmark.) **MA.C.2.2.2**
	INSTRUCTIONAL STRATEGIES	For Grades 3–5, ☐ Use manipulatives to develop an understanding of reflections (flips), translations (slides), and rotations (turns). ☐ Avoid teaching 90-degree and 270-degree rotations in isolation. Using computer drawing programs to show rotations and reflections has shown to be effective. Also, students need many and varied examples of symmetry, congruency, and/or similarity. Non-examples of these concepts must also be emphasized (e.g., Demonstrate the difference between a rectangle's lines of symmetry and its diagonals. A diagonal divides a rectangle into two equal-sized parts but is not a line of symmetry.).

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INSTRUCTIONAL FOCAL POINTS

Table 1: Compendium of Instructional Strategies for Grades 3-5 Source for Strategies: *FCAT Mathematics Lessons Learned: 2001–2005 Data Analyses and Instructional Implications*		
MODULE	**STRAND C: GEOMETRY AND SPATIAL SENSE**	
6	**STANDARD**	**C3:** **The student uses coordinate geometry to locate objects in both two and three dimensions and to describe objects algebraically.**
	BENCHMARK(S)	**MA.C.3.2.1*** (Grade 5 students will be required to complete a performance task item on the FCAT for this benchmark.) **MA.C.3.2.2**
	INSTRUCTIONAL STRATEGIES	For Grades 3–5, ☐ Emphasize geometric terminology and provide hands-on practice using blocks, colored tiles, and manipulatives to compute the area and perimeter of regular, irregular, and, Grades 4 and 5, composite figures. ☐ Instruction should include practice with figures drawn on grids that have scales to calculate the measurement of the sides. ☐ Find resources beyond the text by identifying and using real-world applications (e.g., painting a room) to represent multiple-step perimeter and area problems. ☐ Reinforce multiplication arrays to facilitate finding sides of a rectangle, given its area. ☐ Students should calculate both perimeter on the same figure and discuss the differences between them.

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INSTRUCTIONAL FOCAL POINTS

Table 1: Compendium of Instructional Strategies for Grades 3-5 Source for Strategies: *FCAT Mathematics Lessons Learned: 2001–2005 Data Analyses and Instructional Implications*		
MODULE	**STRAND D: ALGEBRAIC THINKING**	
7	**STANDARD**	**D1:** **The student describes, analyzes, and generalizes a wide variety of patterns, relations, and functions.**
	BENCHMARK(S)	**MA.D.1.2.1** **MA.D.1.2.2*** (Grade 5 students will be required to complete a performance task item on the FCAT for this benchmark.)
	INSTRUCTIONAL STRATEGIES	☐ When working with patterns and relationships in a two-column table format, emphasize generalizing the relationship between two variables, rather than only finding a pattern in a consecutive set of numbers in one of the columns. Students should practice applying that relationship to find a missing number in a set that does not have a linear pattern with equal intervals. Students should also practice finding a number that is extended beyond the next step in a linear pattern. ☐ Use manipulatives to work through problems involving patterns and relationships. ☐ Emphasize reading skills in the mathematics curriculum to improve student performance on items set in a real-world context.
	Infusion of Strand A: Number Sense, Concepts and Operations **Standard 5: The student understands and applies theories related to numbers.** **Benchmark: MA.A.5.2.1**	
	☐ Give instruction that emphasizes meaning, concept, and application, in addition to learning number facts. ☐ In reviewing this benchmark, reinforce factors and multiples and, at Grade 5, prime numbers.	

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<table>
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<tr><th>MODULE</th><th colspan="2">STRAND D: ALGEBRAIC THINKING</th></tr>
<tr><td rowspan="4">8</td><td>STANDARD</td><td>D2:
The student uses expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.</td></tr>
<tr><td>BENCHMARK(S)</td><td>MA.D.2.2.1
MA.D.2.2.2</td></tr>
<tr><td>INSTRUCTIONAL STRATEGIES</td><td>For Grades 3–5,
☐ Stress critical reading skills in mathematics. Students should review and interpret the entire problem before attempting to translate a word problem into an equation, expression, or inequality, or attempting to solve a problem.
☐ Students should understand that word problems do not always contain expected key words and there are often several different ways to represent the symbolic translation of a problem, as well as several different ways to solve the same problem. Ask students to check for the reasonableness of their solutions at all times.
In Grades 4 and 5,
☐ Students should have more instruction in the meaning of the symbols ≥ and ≤, and the terminology associated with the symbols.</td></tr>
<tr><td colspan="2">Infusion of Strand A: Number Sense, Concepts and Operations
Standard 3: The student understands the effects of operations on numbers and the relationships among these operations, selects appropriate operations, and computes for problem solving.
Benchmark(s): MA.A.3.2.1 and MA.A.3.2.2</td></tr>
<tr><td colspan="2">Students performed well overall, but those who struggled had difficulty understanding the concepts of division and subtraction.
☐ Provide practice with word problems that have multiple steps and problems that do not contain key phrases, such as how much in all, what is the total, and how many are left.
☐ In Grades 3 and 4, students need practice regrouping with problems involving subtraction.</td></tr>
</table>

INSTRUCTIONAL FOCAL POINTS

Table 1: Compendium of Instructional Strategies for Grades 3-5 Source for Strategies: *FCAT Mathematics Lessons Learned: 2001–2005 Data Analyses and Instructional Implications*		
MODULE	**STRAND E: DATA ANALYSIS AND PROBABILITY**	
9	**STANDARD**	**E1:** **The student understands and uses the tools of data analysis for managing information.**
	BENCHMARK(S)	**MA.E.1.2.1*** (Grade 5 students will be required to complete a performance task item on the FCAT for this benchmark.) **MA.E.1.2.2** **MA.E.1.2.3**
	INSTRUCTIONAL STRATEGIES	For Grade 3, ☐ When teaching pictographs, students should practice with partial representations of the units in the legend. Practice should start with smaller numbers and increase to larger numbers (e.g., single to double to triple digits) within content limits. For Grade 4, ☐ Students should practice using multiple-step problems with bar graphs where they must manipulate the data. ☐ Students should have experience calculating and applying the concepts of range and median when numbers are not in order. ☐ Provide opportunities for students to work problems involving multiple formats, graphs, and tables. For Grade 5, ☐ Stress number sense and percents and emphasize reasonableness of answers. ☐ Students should apply range and mean concepts with multiple-step directions. ☐ Students should practice the use of all types of graphs, tables, and charts. ☐ Students should practice finding the median of a set of data with an even number of data points.

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INSTRUCTIONAL FOCAL POINTS

Table 1: Compendium of Instructional Strategies for Grades 3-5 **Source for Strategies: *FCAT Mathematics Lessons Learned: 2001–2005 Data Analyses and Instructional Implications***		
MODULE	**STRAND E: DATA ANALYSIS AND PROBABILITY**	
10	**STANDARD**	**E2:** **The student identifies patterns and makes predictions from an orderly display of data using concepts of probability and statistics.**
	BENCHMARK(S)	**MA.E.2.2.1*** (Grade 5 students will be required to complete a performance task item on the FCAT for this benchmark.)
	INSTRUCTIONAL STRATEGIES	For Grades 3–5, ☐ Emphasis on using tables and other methods to find outcomes, as opposed to just counting them. ☐ Students should develop their vocabulary of outcomes and combinations to better understand the concepts. For Grade 5, ☐ Students should practice calculating probability with *and* and *or* statements. ☐ Emphasize practice with spinners having unequal parts. ☐ Spinners having unequal parts should be compared to spinners with equal parts, so that students will have a better understanding of the meanings of *most likely, least likely,* and *equal* outcomes. Students should practice working with tree diagrams and charts to represent combinations as well as making lists.

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SSS MATHEMATICS BENCHMARKS ASSESSED AND ITEM FORMATS

TABLE 2: SSS MATHEMATICS BENCHMARKS ASSESSED AT GRADES 3-5
Source: Florida Department of Education

SUNSHINE STATE STANDARDS BENCHMARK	ITEM FORMATS		
GRADES 3-5	**GRADE 3**	**GRADE 4**	**GRADE 5**
MC: MULTIPLE-CHOICE; GR: GRIDDED-RESPONSE; SR: SHORT-RESPONSE; ER: EXTENDED-RESPONSE			
STRAND A: NUMBER SENSE, CONCEPTS, AND OPERATIONS			
MA.A.1.2.1 names whole numbers combining three-digit numeration (hundreds, tens, ones) and the use of number periods, such as ones, thousands, and millions and associates verbal names, written word names, and standard numerals with whole numbers, commonly used fractions, decimals, and percents.	Assessed with A.1.2.4	Assessed with A.1.2.4	Assessed with A.1.2.4
MA.A.1.2.2 understands the relative size of whole numbers, commonly used fractions, decimals, and percents.	MC	MC	MC, GR
MA.A.1.2.3 understands concrete and symbolic representations of whole numbers, fractions, decimals, and percents in real-world situations.	Assessed with A.1.2.4	Assessed with A.1.2.4	Assessed with A.1.2.4
MA.A.1.2.4 understands that numbers can be represented in a variety of equivalent forms using whole numbers, decimals, fractions, and percents. (Also assesses A.1.2.1 and A.1.2.3)	MC	MC	MC, GR
MA.A.2.2.1 uses place-value concepts of grouping based upon powers of ten (thousandths, hundredths, tenths, ones, tens, hundreds, thousands) within the decimal number system.	MC	MC	MC, GR
MA.A.2.2.2 recognizes and compares the decimal number system to the structure of other number systems such as the Roman numeral system or bases other than ten.	Not assessed	Not assessed	Not assessed
MA.A.3.2.1 understands and explains the effects of addition, subtraction, and multiplication on whole numbers, decimals, and fractions, including mixed numbers, and the effects of division on whole numbers, including the inverse relationship of multiplication and division.	MC	MC	MC
MA.A.3.2.2 selects the appropriate operation to solve specific problems involving addition, subtraction, and multiplication of whole numbers, decimals, and fractions, and division of whole numbers.	MC	MC	MC

TABLE 2: SSS MATHEMATICS BENCHMARKS ASSESSED AT GRADES 3-5 Source: Florida Department of Education			
SUNSHINE STATE STANDARDS BENCHMARK	**ITEM FORMATS**		
GRADES 3-5	**GRADE 3**	**GRADE 4**	**GRADE 5**
MC: MULTIPLE-CHOICE; GR: GRIDDED-RESPONSE; SR: SHORT-RESPONSE; ER: EXTENDED-RESPONSE			
STRAND A: NUMBER SENSE, CONCEPTS, AND OPERATIONS (CONTINUED)			
MA.A.3.2.3 adds, subtracts, and multiplies whole numbers, decimals, and fractions, including mixed numbers, and divides whole numbers to solve real-world problems, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.	MC	MC	MC, GR
MA.A.4.2.1. uses and justifies different estimation strategies in a real-world problem situation and determines the reasonableness of results of calculations in a given problem situation. (Also assesses B.3.2.1)	MC	MC	SR
MA.A.5.2.1. understands and applies basic number theory concepts, including primes, composites, factors, and multiples.	MC	MC	MC
STRAND B: MEASUREMENT			
MA.B.1.2.1 uses concrete and graphic models to develop procedures for solving problems related to measurement including length, weight/mass, time, temperature, perimeter, area, volume/capacity, and angle.	Not assessed	Not assessed	Assessed with C.2.2.1
MA.B.1.2.2 solves real-world problems involving length, weight, perimeter, area, capacity, volume, time, temperature, and angles.	MC	MC	MC, GR
MA.B.2.2.1 uses direct (measured) and indirect (not measured) measures to calculate and compare measurable characteristics.	MC	MC	MC,GR
MA.B.2.2.2 selects and uses appropriate standard and nonstandard units of measurement, according to type and size. (Also assesses B.4.2.1)	MC	MC	MC
MA.B.3.2.1 solves real-world problems involving estimates of measurements, including length, time, weight, temperature, money, perimeter, area, and volume.	Assessed with A.4.2.1	Assessed with A.4.2.1	Assessed with A.4.2.1
MA.B.4.2.1 determines which units of measurement, such as seconds, square inches, and dollars per tankful, to use with answers to real-world problems.	Assessed with B.2.2.2	Assessed with B.2.2.2	Assessed with B.2.2.2
MA.B.4.2.2 selects and uses appropriate instruments and technology, including scales, rulers, thermometers, measuring cups, protractors, and gauges, to measure in real-world situations.	MC	MC	Not Assessed

TABLE 2: SSS MATHEMATICS BENCHMARKS ASSESSED AT GRADES 3-5 Source: Florida Department of Education			
SUNSHINE STATE STANDARDS BENCHMARK	**ITEM FORMATS**		
GRADES 3-5	**GRADE 3**	**GRADE 4**	**GRADE 5**
MC: MULTIPLE-CHOICE; GR: GRIDDED-RESPONSE; SR: SHORT-RESPONSE; ER: EXTENDED-RESPONSE			
STRAND C: GEOMETRY AND SPATIAL SENSE			
MA.C.1.2.1 given a verbal description, draws and/or models two- and three-dimensional shapes and uses appropriate geometric vocabulary to write a description of a figure or a picture composed of geometric figures.	MC	MC	MC
MA.C.2.2.1 understands the concepts of spatial relationships, symmetry, reflections, congruency, and similarity. (Also assesses B.1.2.1, B.1.2.2, C.1.2.1, and C.3.2.1)	MC	MC	MC, ER
MA.C.2.2.2 predicts, illustrates, and verifies which figures could result from a flip (reflection), slide (translation), or turn (rotation) of a given figure.	MC	MC	MC
MA.C.3.2.1 represents and applies a variety of strategies and geometric properties and formulas for two- and three-dimensional shapes to solve real-world and mathematical problems. (Also assesses C.2.2.1 and C.3.2.2)	MC	MC	MC, SR
MA.C.3.2.2 identifies and plots positive ordered pairs (whole numbers) in a rectangular coordinate system (graph).	MC	MC	MC
STRAND D: ALGEBRAIC THINKING			
MA.D.1.2.1 describes a wide variety of patterns and relationships through models such as manipulatives, tables, graphs, rules using algebraic symbols. (Also assesses D.1.2.2)	MC	MC	MC, GR
MA.D.1.2.2 generalizes a pattern, relation, or function to explain how a change in one quantity results in a change in another. (Also assesses D.1.2.1)	Not assessed	Not assessed	SR
MA.D.2.2.1 represents a given simple problem situation using diagrams, models, and symbolic expressions translated from verbal phrases, or verbal phrases translated from symbolic expressions, etc. (Also assesses D.2.2.2)	MC	MC	MC
MA.D.2.2.2 uses informal methods, such as physical models and graphs, to solve real-world problems involving equations and inequalities. (Also assesses D.2.2.1)	MC	MC	MC, GR
STRAND E: DATA ANALYSIS AND PROBABILITY			
MA.E.1.2.1 solves problems by generating, collecting, organizing, displaying, and analyzing data using histograms, bar graphs, circle graphs, line graphs, pictographs, and charts (Also assesses E.1.2.2 and E.1.2.3)	MC	MC	MC, GR, ER

TABLE 2: SSS MATHEMATICS BENCHMARKS ASSESSED AT GRADES 3-5 Source: Florida Department of Education			
SUNSHINE STATE STANDARDS BENCHMARK	ITEM FORMATS		
GRADES 3-5	GRADE 3	GRADE 4	GRADE 5
MC: MULTIPLE-CHOICE; GR: GRIDDED-RESPONSE; SR: SHORT-RESPONSE; ER: EXTENDED-RESPONSE			
STRAND E: DATA ANALYSIS AND PROBABILITY (CONTINUED)			
MA.E.1.2.2 determines range, mean, median, and mode from sets of data. (Also assesses E.1.2.3)	MC	MC	MC, GR
MA.E.1.2.3 analyzes real-world data to recognize patterns and relationships of the measures of central tendency using tables, charts, histograms, bar graphs, line graphs, and pictographs, and circle graphs generated by appropriate technology, including calculators and computers.	Assessed with E.1.2.1 and E.1.2.2	Assessed with E.1.2.1 and E.1.2.2	Assessed with E.1.2.1 and E.1.2.2
MA.E.2.2.1 uses models, such as tree diagrams, to display possible outcomes and to predict events.	MC	MC	SR
MA.E.2.2.2 predicts the likelihood of simple events occurring.	MC	MC	MC
MA.E.3.2.1 designs experiments to answer class or personal questions, collects information, and interprets the results using statistics (range, mean, median, and mode) and pictographs, charts, bar graphs, circle graphs, and line graphs. (Also assesses E.3.2.2)	Not assessed	Not assessed	MC
MA.E.3.2.2 uses statistical data about life situations to make predictions and justifies reasoning.	Not assessed	Not assessed	Assessed with E.3.2.1

FCAT ITEM FORMAT

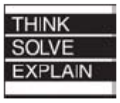
There are several question formats on the FCAT, depending on the grade level and the subject (content area) being tested. The types of questions on each test are explained below. The graphic icons are used in student test documents to identify the different types of FCAT test questions.

Multiple-choice (**MC**) questions require students to choose the best answer from four possible choices and to mark their answers by filling in the appropriate "bubble" in their test books or answer documents.

Gridded-response (**GR**) questions require students to solve problems and mark their numerical answers in answer grids. Answers may be gridded using several correct formats. Students MUST accurately fill in the bubbles below the grids to receive credit for their answers.

Performance tasks require students to respond to test questions in their own words or to show their own solutions. For FCAT Mathematics, there are two types of performance tasks: short-response (SR) tasks and extended-response (ER) tasks. Performance tasks are scored using rubrics (criteria). The raw score for an SR complete and correct answer is 2 raw score points, and a partially correct answer is 1 raw score point. For an ER, a complete and correct answer is 4 raw score points and a partially correct answer is 1, 2, or 3 raw score points.

FCAT Mathematics **"Think, Solve, Explain"** performance tasks require students to read all parts of the question carefully, to think about and to analyze a problem, to determine a way to solve the problem, and to write a method of solution or an answer to the problem in their own words.



An **SR** task may ask for an equation that represents a problem situation.

Mathematics
SR

An **ER** task requires a longer, more detailed response, such as constructing a graph.

Mathematics
ER

Performance task answer spaces include blank work space, charts or graphs, or lined answer space, based on what is required to answer the SR or ER.

FCAT MATHEMATICS SCORING RUBRICS

Rubrics are the scoring guidelines or criteria used to evaluate all Mathematics performance tasks. The rubric describes what is required for each possible score point.

For the extended-response tasks, a 4-point rubric is used (4, 3, 2, 1). A 2-point rubric (2, 1) is used for short-response tasks. A score of "0" is used for responses that are completely incorrect, irrelevant, uninterpretable, or blank.

The tables 3 and 4 provide the general FCAT Mathematics scoring rubrics for grade 5.

Table 3: GENERAL FCAT MATHEMATICS SCORING RUBRICS GRADE 5	
SHORT-RESPONSE (SR) TASKS	
POINTS	**RESPONSE SCORING**
2 points	A score of two indicates that the student has demonstrated a thorough understanding of the mathematics concepts and/or procedures embodied in the task. The student has completed the task correctly, in a mathematically sound manner. When required, student explanations and/or interpretations are clear and complete. The response may contain minor flaws that do not detract from the demonstration of a thorough understanding.
1 points	A score of one indicates that the student has provided a response that is only partially correct. For example, the student may provide a correct solution, but may demonstrate some misunderstanding of the underlying mathematical concepts or procedures. Conversely, a student may provide a computationally incorrect solution but could have applied appropriate and mathematically sound procedures, or the student's explanation could indicate an understanding of the task, despite the error.
0 points	A score of zero indicates the student has provided either no response at all, or a completely incorrect or uninterpretable response or demonstrated insufficient understanding of the mathematics concepts and/or procedures embodied in the task. For example, a student may provide some work that is mathematically correct, but the work does not demonstrate even a rudimentary understanding of the primary focus of the task.

Table 4: GENERAL FCAT MATHEMATICS SCORING RUBRICS GRADE 5	
EXTENDED-RESPONSE (ER) TASKS	
POINTS	**RESPONSE SCORING**
4 points	A score of four is a response in which the student demonstrates a thorough understanding of the mathematics concepts and/or procedures embodied in the task. The student has responded correctly to the task, used mathematically sound procedures, and provided clear and complete explanations and interpretations. The response may contain minor flaws that do not detract from the demonstration of a thorough understanding.
3 points	A score of three is a response in which the student demonstrates an understanding of the mathematics concepts and/or procedures embodied in the task. The student's response to the task is essentially correct with the mathematical procedures used and the explanations and interpretations provided demonstrating an essential but less than thorough understanding. The response may contain minor flaws that reflect inattentive execution of mathematical procedures or indications of some misunderstanding of the underlying mathematics concepts and/or procedures.
2 points	A score of two indicates that the student has demonstrated only a partial understanding of the mathematics concepts and/or procedures embodied in the task. Although the student may have used the correct approach to obtaining a solution or may have provided a correct solution, the student's work lacks an essential understanding of the underlying mathematical concepts. The response contains errors related to misunderstanding important aspects of the task, misuse of mathematical procedures, or faulty interpretations of results.
1 point	A score of one indicates that the student has demonstrated a very limited understanding of the mathematics concepts and/or procedures embodied in the task. The student's response is incomplete and exhibits many flaws. Although the student's response has addressed some of the conditions of the task, the student reached an inadequate conclusion and/or provided reasoning that was faulty or incomplete. The response exhibits many flaws or may be incomplete.
0 points	A score of zero indicates the student has provided either no response at all, or a completely incorrect or uninterpretable response, or demonstrated insufficient understanding of the mathematics concepts and/or procedures embodied in the task. For example, a student may provide some work that is mathematically correct, but the work does not demonstrate even a rudimentary understanding of the primary focus of the task.

HINTS FOR STUDENTS TAKING THE FCAT MATHEMATICS TEST

Here are some hints to help you do your best when you take the FCAT mathematics test. Keep these hints in mind when you answer the sample questions.

- Learn how to answer each kind of question. FCAT mathematics tests have four types of questions: multiple-choice, gridded-response, short-response, and extended-response.
- Read each problem carefully and think about ways to solve the problem before you try to answer the question.
- Answer the questions you are sure about first. If a question seems too difficult, skip it and go back to it later.
- Be sure to fill in the answer bubbles correctly. Do not make any stray marks around answer spaces.
- Think positively. Some problems may seem hard to you, but you may be able to figure out what to do if you read each question carefully.
- When you have finished each problem, reread it to make sure your answer is reasonable.
- Relax. Some people get nervous about tests. It's natural. Just do your best.

TIPS ON HOW TO ANSWER THE "THINK, SOLVE, AND EXPLAIN" QUESTIONS

Answers to the short- and extended-response problems can receive full or partial credit. You should try to answer these questions even if you are not sure of the correct answer. If a portion of the answer is correct, you will get a portion of the points.

- Allow about 5 minutes to answer the short "Think, Solve, and Explain" questions and about 10 to 15 minutes to answer the long ones.
- Read the question carefully.
- If you do not understand the question, read and answer one part at a time.
- Be sure to answer every part of the question.
- Use numbers and other information from the problem to answer the question.
- Show your work. This shows that you understand how to solve the problem.
- Write your explanations in clear, concise language. Use only the space provided.
- Check your work to make sure the procedures and calculations are correct.
- Reread your explanation to make sure it says what you want it to say.

GENERAL TEST TAKING TIPS FOR PARENTS TO REMEMBER

Compiled directly from *Florida Department of Education Bureau of Family and Community Outreach*
http://fcat.fldoe.org/pdf/fcatfact.pdf

1. Make sure your child attends school regularly. Remember that tests reflect the overall achievement of your child. The more often the child is in a learning situation, the more likely he/she will do well on tests.

2. Give your child encouragement. Praise him/her for the things done well throughout the year. A child who is afraid of failing is more likely to make a mistake.

3. See that your child has a well-rounded diet. A healthy body leads to a healthy, active mind.

4. See that your child completes homework assignments. Homework supports classroom instruction and can help your child increase his/her comprehension of the classroom work.

5. Meet with your child's teacher(s) as often as possible to discuss your child's progress. Parents and teachers should work together to benefit the child.

6. Ask the teacher(s) to suggest activities for you to do at home with your child. Such activities can help your child improve his/her understanding of school work.

7. Make sure your child is well rested on school days. Children who are tired are less likely to pay attention in class or to handle the demands of classwork and tests.

8. Try not to be overly anxious about test scores. Too much emphasis on test scores can be upsetting to children.

9. Find out which tests your child will take and for what purposes. The school principal and counselor should provide you with a schedule of testing for the year and explain the use of the tests.

10. Make sure your child arrives on time for school.

11. See that your child dresses comfortably. Students should wear clothes that are comfortable and appropriate for the weather.

12. If your child wears a hearing aid or glasses, be sure he/she remembers to use them during all testing sessions.

13. Make sure your child receives any necessary test taking accommodations.

14. Remember, make sure that your child is well rested and has a healthy breakfast on the day of the test.

WHAT PARENTS CAN DO TO SUPPORT THE LEARNING OF MATHEMATICS?

Parents can relate math to everyday life by encouraging children to be problem solvers, to communicate mathematically, and to develop reasoning ability. To do this, parents can begin to ask their children to:

Be a problem solver-
- question, investigate and explore solutions to problems,
- stick with a problem and find a solution
- understand that there may be different ways to arrive at an answer
- apply math to everyday situations and uses it successfully
- be involved in family decision-making using math.

Communicate mathematically-
- use words, numbers and mathematical symbols to explain situations
- talk about how you arrive at an answer
- listen to others' ways of thinking
- write about math not just give answers
- ask about the process used

Demonstrate reasoning ability-
- think logically
- look for similarities and differences in things
- thinking about relationships among things
- explain answers to simple problems and more complicated ones as well

BENEFITS OF PARENT INVOLVEMENT

We know from research that children are more likely to be successful learners of any subject when parents actively support their learning. Today, helping children make the effort to learn, appreciate and master mathematics is more important than ever. Here are some of the benefits of parental involvement:

For students…
- higher grades, test scores, and graduation rates
- better school attendance
- increased motivation, better self-esteem
- greater enrollment in postsecondary education

For teachers…
- communication/relations with students, parents, families, and communities improves
- community support of schools increases
- teaching effectiveness (proficiency) increases
- job satisfaction goes up
- greater morale (and self-esteem)

For parents…
- communication/relations with children and teachers improves
- decision-making skills become stronger
- attitude toward school and school personnel improves
- self-esteem goes up