FLORIDA'S BENCHMARKS FOR EXCELLENT STUDENT THINKING STANDARDS

Parent Guide for Grade 8 Mathematics

The Benchmarks for Excellent Student Thinking (B.E.S.T.) Standards for Mathematics are the state's mathematical standards that pave the way for Florida students to receive a world-class education and prepare them for a successful future.

THESE STANDARDS WERE WRITTEN TO:

Provide clarity on the grade-level expectations for educators, parents and students.

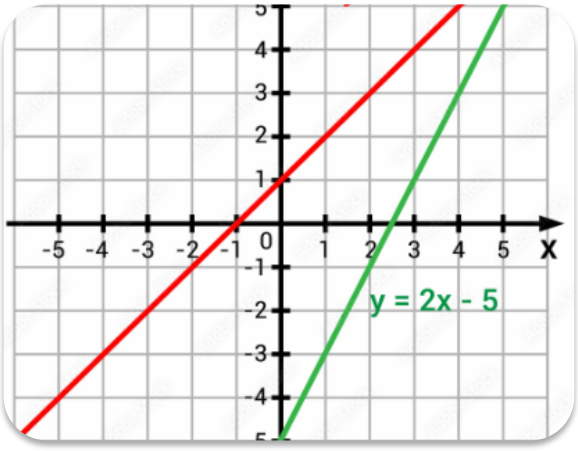
Allow students flexibility to solve problems using a method/strategy of their choice.

Allow for student discovery (i.e., exploration) of strategies rather than the teaching, naming and assessing of each strategy individually.

Education leaders from across the state came together to develop Florida's B.E.S.T. Standards for Mathematics. These standards and benchmarks are goals that students are expected to achieve by the end of the school year. A standard is an overarching criterion for a grade level or grade band. A benchmark is a specific expectation or skill for the grade level or grade band that falls within a standard. The B.E.S.T. Standards are designed to ensure that ALL students reach their greatest potential.

Preparing your student for success begins in Kindergarten and continues as your child progresses through each grade. This guide will support parents, guardians and families with students in Grade 8 by helping them:

- **LEARN about the B.E.S.T. Standards for Mathematics and why they matter for your student.**
- **UNDERSTAND important educational (academic) words that you will see in your student's grade-level standards and benchmarks.**
- **TALK with your student's teacher about what they will be learning in the classroom.**
- **LOCATE activities and resources to support your student's learning in practical ways at home.**



Learn About the Grade 8 Mathematics Standards

This table describes the areas of emphasis within Grade 8 and provides examples of specific expectations within each area of emphasis. The purpose of the areas of emphasis is not to guide specific units of learning and instruction but rather provide insight on major mathematical topics that will be covered within the grade level. The table below is not in any set order in which areas should be taught. Areas of emphasis may be taught in any order, combined with others and taught throughout the year.

Area of Emphasis	**Examples**
Represent numbers in scientific notation and extend the set of numbers to the system of real numbers, which includes irrational numbers.	☐ Approximate the value of rational and irrational numbers on a number line. ☐ Express numbers in scientific notation. ☐ Add, subtract, multiply and divide numbers expressed in scientific notation.
Generate equivalent numeric and algebraic expressions including using the Laws of Exponents.	☐ Apply the Laws of Exponents to evaluate numerical expressions and generate equivalent algebraic expressions. ☐ Multiply two linear expressions.
Create and reason about linear relationships including modeling an association in bivariate data with a linear equation.	☐ When given a table, graph or written description of a linear relationship, determine the slope and write an equation in slope-intercept form ($y = mx + b$). ☐ Construct a scatter plot or a line graph. ☐ Find the theoretical probability of an event related to a repeated experiment.
Solve linear equations, inequalities and systems of linear equations.	☐ Solve multi-step linear equations and two-step linear inequalities. ☐ Determine which ordered pairs satisfy a system of linear equations. ☐ Given a system of equations, determine whether there is one solution, no solution or infinitely many solutions.
Develop an understanding of the concept of a function.	☐ Determine if a relationship is a function given a table, graph, set of ordered pairs or mapping diagram. ☐ Identify the domain and range of a relation. ☐ Identify from a function where it is increasing, decreasing or constant.
Analyze two-dimensional figures, particularly triangles, using distance, angle and applying the Pythagorean Theorem.	☐ Apply the Pythagorean Theorem. ☐ Use the Triangle Inequality Theorem. ☐ Solve problems involving supplementary, complementary, vertical or adjacent angles. ☐ Given a preimage and image generated by a single transformation, identify the transformation that describes the relationship.

B.E.S.T. Instructional Guide for Mathematics

The B.E.S.T. Instructional Guide for Mathematics (B1G-M) is intended to assist educators with planning for student learning and instruction aligned to Florida's Benchmarks for Excellent Student Thinking (B.E.S.T.) Standards. This guide is designed to aid high-quality instruction through the identification of components that support the learning and teaching of the B.E.S.T. Mathematics Standards and Benchmarks. The B1G-M can be utilized by parents, guardians and families to support learning at home through the Instructional Strategies section.

This document is posted on the B.E.S.T. Standards for Mathematics webpage (https://www.fldoe.org/academics/standards/subject-areas/math-science/mathematics/bestmath.stml) of the Florida Department of Education's website and will continue to undergo edits as needed.

Mathematical Words to Know and Use in Grade 8

Adjacent Angles	Coordinate Plane	Intercept	Outlier	Regular Polygon	Slope Intercept Form
Angle	Dilation	Interior Angles	Pi (π)	Rotation	Supplementary Angles
Base	Domain	Irrational Numbers	Proportional Relationship	Sample Space	Systems of Equations
Bivariate Data	Exponent	Line of Fit	Pythagorean Theorem	Scale Factor	Theoretical Probability
Coefficient	Expression	Linear Equation	Radical	Scatter Plot	Transformation
Complementary Angles	Exterior Angles	Linear Expression	Range	Scientific Notation	Translation
Congruent	Function	Linear Function	Rational Numbers	Significant Digits	Triangle Inequality Theorem
Constant of Proportionality	Hypotenuse	Monomial	Real Numbers	Similarity	Vertical Angles
Coordinate	Integer	Number Line	Reflection	Slope	y-intercept

This is not a comprehensive list – please access the 6-12 Glossary.
To access the full K-12 Mathematics Glossary, visit https://cpalmsmediaprod.blob.core.windows.net/uploads/docs/standards/best/ma/appendixc.pdf.

Support Learning at Home

You can encourage learning mathematics at home in ways that are fun for you and your student. Try these ideas after school, on weekends and during the summer:

- ✓ Practice vocabulary utilized within the Grade 8 Mathematics course. Encourage mathematical discourse within your family.
- ✓ Look up the current population of the United States and another country you would like to visit. Write each population in scientific notation. What is the difference in populations? How many times bigger is one population versus the other?
- ✓ Using a deck of cards, have your student find the theoretical probability of pulling a 5, with replacement, then pulling a spade. [Answer = p (5, spade) $\frac{4}{52} \cdot \frac{13}{52} = \frac{52}{2704} = \frac{1}{52}$]
- ✓ Using chalk on a sidewalk, draw two straight lines. Have your student determine if there is one solution, no solution or infinitely many solutions. [Parallel lines = no solution, intersecting lines = 1 solution, lines drawn on top of each other (same line) = infinitely many solutions].
- ✓ Look up the different elevations (heights) during the track of your favorite rollercoaster. Describe when the rollercoaster's elevation is increasing, decreasing or constant.
- ✓ Look at a map of your neighborhood. Determine which streets represent a pair of supplementary, complementary, vertical or adjacent angles.
- ✓ Find three crayons and create a straight angle (180°) with 2 crayons. Where the two crayons touch, add a third crayon, which will create 2 adjacent angles that will also be supplementary angles (adds up to 180°).
- ✓ Find three crayons and create a right angle (90°) with 2 crayons. Where the two crayons touch, add a third crayon, which will create 2 adjacent angles that will also be complementary angles (adds up to 90°).

Talk with Your Student's Teacher

Think about a parent-teacher conference as a "team meeting" in which you will discover the special contributions each of you bring to your student's success. Here are some questions you could ask to prompt discussions:

What topic is my student currently working on? Which have they mastered? How can I support them at home?

In the area of mathematics, what are my student's strengths? How are those strengths supported during instruction? Where is my student struggling and how can I help?

Can my student show you that they understand what they are learning about through manipulatives, drawing, talking and writing? If not, what challenges are they facing?

What additional resources can I use at home to help support my student's mathematical learning?

What behaviors should I see when my student is doing math? Can I see an example of the type of problems my student is given? How can I support them at home?

Mathematical Thinking and Reasoning Standards (MTRs)
Florida students are expected to engage with mathematics through the Mathematical Thinking and Reasoning Standards (MTRs). These standards are written in clear language so all stakeholders can understand them and teachers can assist students to use them as self-monitoring tools. The MTRs promote deeper learning and understanding of mathematics. By understanding the MTRs, parents, guardians and families can support the development of these skills at home.

MA.K12.MTR.1.1 Actively participate in effortful learning both individually and collectively.	**MA.K12.MTR.2.1** Demonstrate understanding by representing problems in multiple ways.	
MA.K12.MTR.3.1 Complete tasks with mathematical fluency.	**MA.K12.MTR.4.1** Engage in discussions that reflect on the mathematical thinking of self and others.	
MA.K12.MTR.5.1 Use patterns and structure to connect mathematical concepts.	**MA.K12.MTR.6.1** Assess the reasonableness of solutions.	**MA.K12.MTR.7.1** Apply mathematics to real-world contexts.

Your student will develop the above skills (MTRs) throughout their education and during their life. These skills will help maintain positive relationships through effective communication, collaboration, conflict resolution and problem solving.

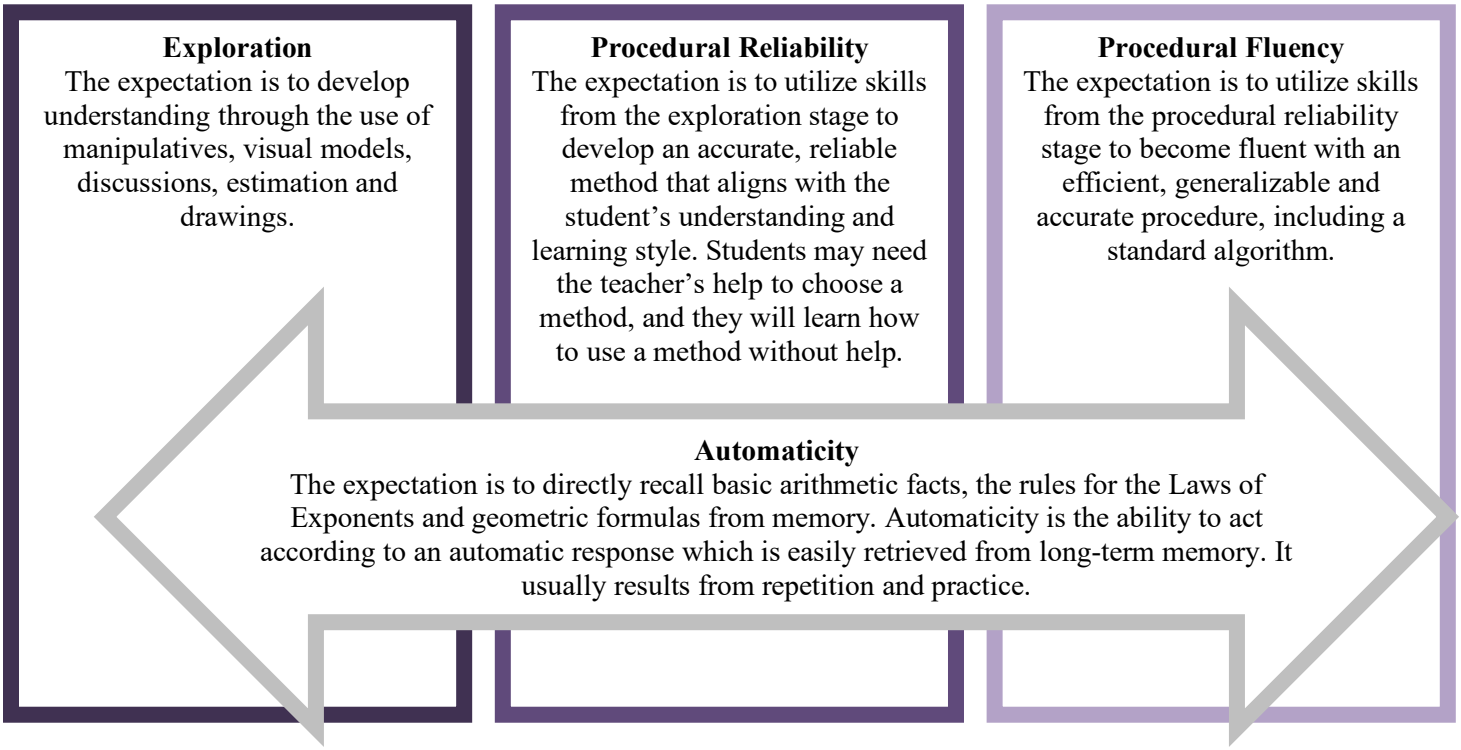
Below are some ways you can help develop mathematical thinking and reasoning skills for your Grade 8 student:

- ✓ Encourage your student to ask questions when they do not understand what is being asked of them.
- ✓ Ask your student to estimate before determining a solution to the task at hand.
- ✓ Identify a problem and create a plan to tackle it in smaller steps that are more manageable.
- ✓ Try activities like a scavenger hunt or a puzzle.

By helping to develop your student's mathematical thinking and reasoning skills, you will prepare them to become a confident, independent and successful individual.

Fluency

Building a strong numeracy foundation is critical to every child's mathematical success. The B.E.S.T. Standards for Mathematics were developed to allow skills to build upon one another within a grade level as well as from one grade to the next. Benchmark expectations have been developed with a hierarchy in mind consisting of three stages: exploration, procedural reliability and procedural fluency. The three stages illustrated below show the stages students may work through when learning new skills and concepts.



In Grade 8, students are expected to be PROCEDURALLY FLUENT when:

1. Using Laws of Exponents to evaluate numerical expressions and generate equivalent algebraic expressions. Restrictions include the use of integer exponents and rational number bases.

   For example, $(4st^2)(-12s^6t^9)$. [Answer: $-48s^7t^{11}$] and $\frac{14xy^8}{2y^3}$ [Answer: $7xy^5$]

2. Adding, subtracting, multiplying and dividing numbers expressed in scientific notation.

   For example, $(7.63 \times 10^5) - (5.2 \times 10^5)$. [Answer: 2.43×10^5 or 243,000]