FLORIDA'S B.E.S.T. MATHEMATICAL THINKING AND REASONING STANDARDS

Charles R. Hadley Elementary

Cafecito Time!

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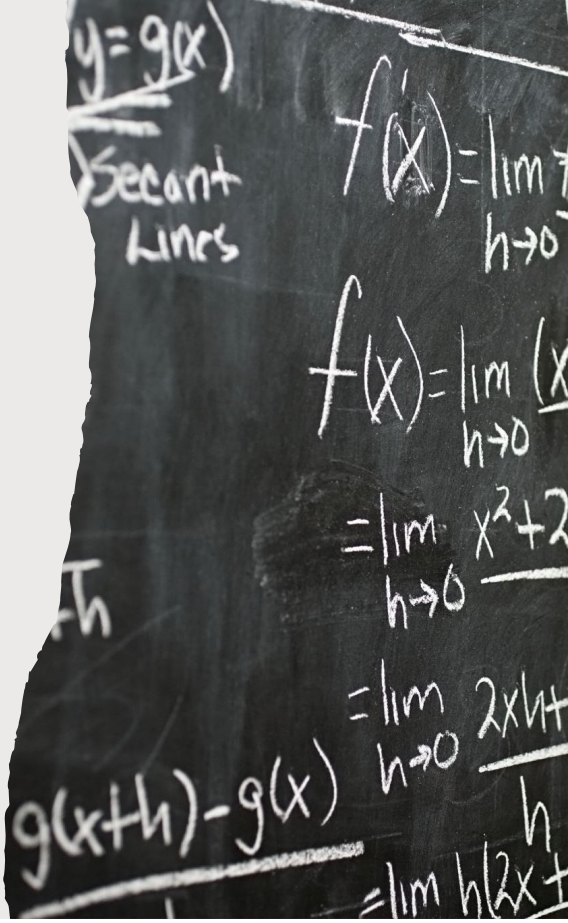
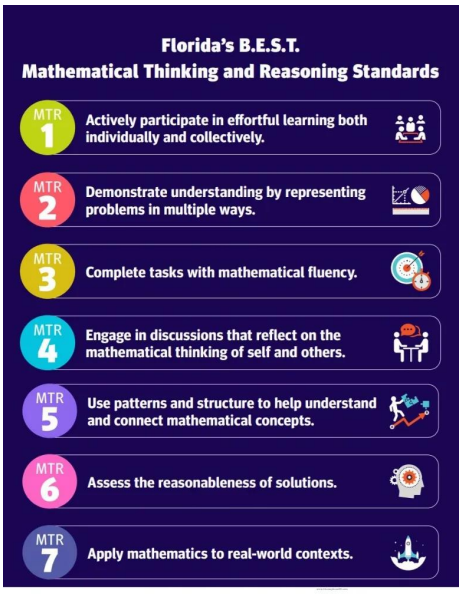


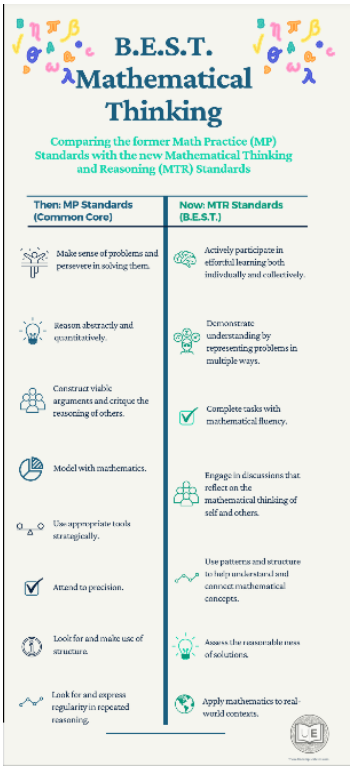
WHAT ARE THE STANDARDS



- Florida's decision to adopt state specific B.E.S.T. standards means the end of the Common Core standards.
- Much is different between the two sets of standards, but one element that has remained is the overarching expectations for mathematical thinking.
- With Common Core, we called these the Standards for Mathematical Practice; with B.E.S.T., the name is shifting slightly to the Mathematical Thinking and Reasoning Standards (MTRs).

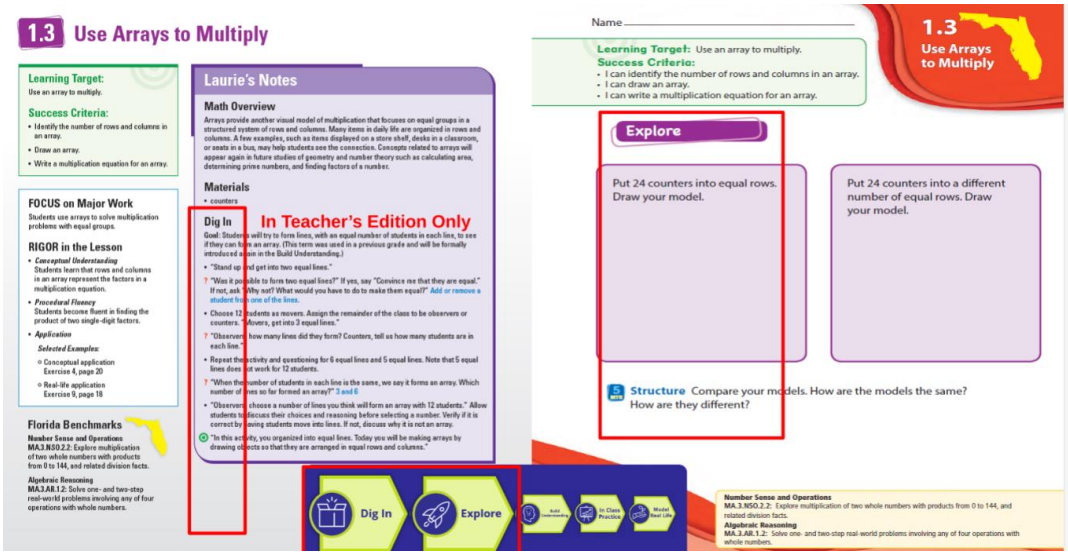
SO, WHAT ARE THE MTRS?

- As with the former Common Core Practice Standards (of which there were eight).
- The B.E.S.T. Thinking and Reasoning Standards (of which there are seven) are all-inclusive expectations for students to use in all K-12 math classes.
- The intent is to "promote deeper learning and understanding" and act as a "self-monitoring" tool for students.

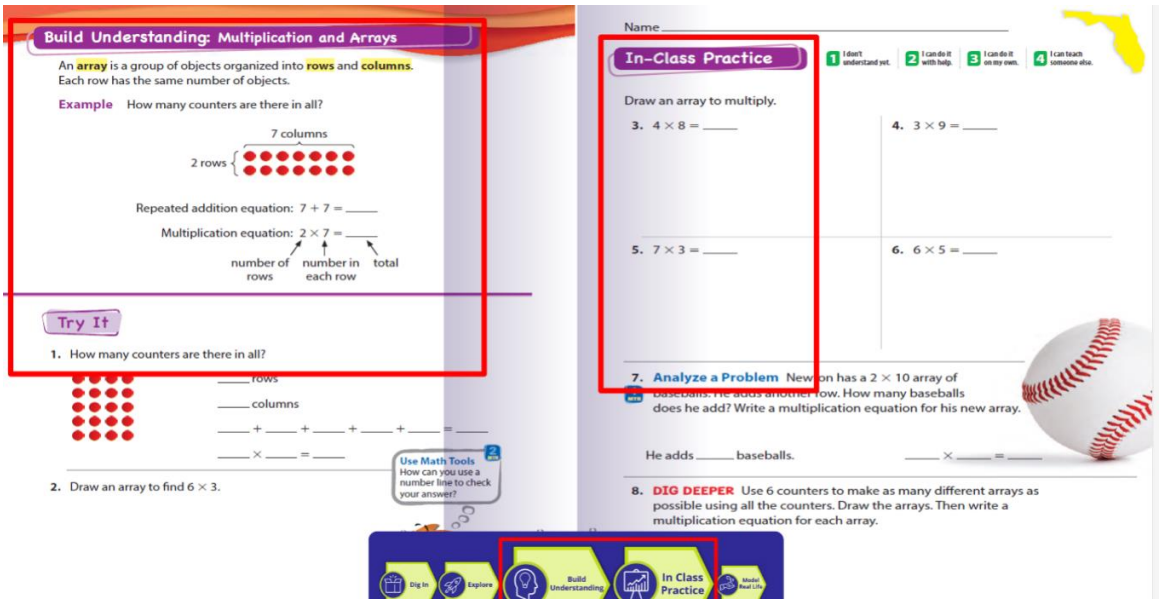


THE LESSON DESIGN

DIG IN & EXPLORE



BUILD UNDERSTANDING
&
IN CLASS PRACTICE



Build Understanding: Multiplication and Arrays

An **array** is a group of objects organized into **rows** and **columns**. Each row has the same number of objects.

Example How many counters are there in all?

7 columns

2 rows

Repeated addition equation: 7 + 7 = ____

Multiplication equation: 2 × 7 = ____

number of rows | number in each row | total

Try It

1. How many counters are there in all?

____ rows

____ columns

____ + ____ + ____ + ____ + ____ = ____

____ × ____ = ____

Use Math Tools: How can you use a number line to check your answer?

2. Draw an array to find 6 × 3.

Name _____

In-Class Practice

1 I don't understand yet. | 2 I can do it with help. | 3 I can do it on my own. | 4 I can teach someone else.

Draw an array to multiply.

3. 4 × 8 = ____

4. 3 × 9 = ____

5. 7 × 3 = ____

6. 6 × 5 = ____

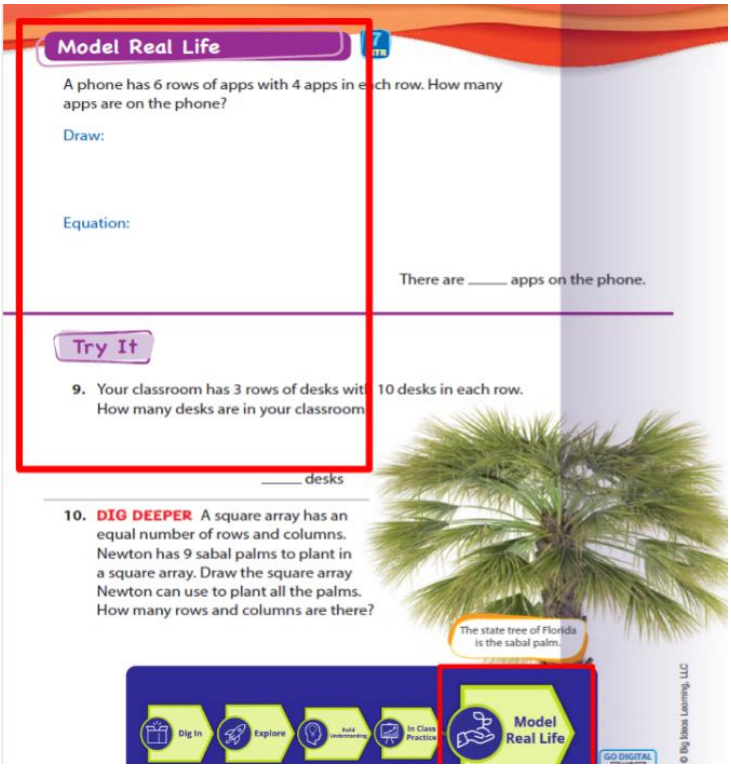
7. **Analyze a Problem** Newton has a 2 × 10 array of baseballs. He adds another row. How many baseballs does he add? Write a multiplication equation for his new array.

He adds ____ baseballs. ____ × ____ = ____

8. **DIG DEEPER** Use 6 counters to make as many different arrays as possible using all the counters. Draw the arrays. Then write a multiplication equation for each array.

Dig In | Explore | Build Understanding | In Class Practice | Model Real Life

MODEL REAL LIFE



Model Real Life

A phone has 6 rows of apps with 4 apps in each row. How many apps are on the phone?

Draw:

Equation:

There are _____ apps on the phone.

Try It

9. Your classroom has 3 rows of desks with 10 desks in each row. How many desks are in your classroom?

_____ desks

10. **DIG DEEPER** A square array has an equal number of rows and columns. Newton has 9 sabal palms to plant in a square array. Draw the square array Newton can use to plant all the palms. How many rows and columns are there?

The state tree of Florida is the sabal palm.

Dig In | Explore | Build Understanding | In Class Practice | Model Real Life

GO DIGITAL

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MA.K12.MTR.2.1
DEMONSTRATE
UNDERSTANDING
BY REPRESENTING PROBLEMS
IN MULTIPLE WAYS.

What Does it Mean?

- If a student can show you multiple ways to solve a problem, then you can be confident that the student has demonstrated understanding of that problem.
- An example of this would be if a student can solve a three-digit addition problem using the standard algorithm, but can also explain it by drawing tens blocks, manipulating 3-d blocks, or demonstrating with money.

WHEN CAN WE USE IT?

In every level of math, from Kindergarten to Calculus, solutions to problems can be represented in at least two ways.

The lower level the math, the more options for representing a solution to a problem.

HOW DO WE DO IT?

As mentioned previously, encourage process over, or at least as much as, product.

Unless you are explicitly working on math fact fluency and automaticity, it is best for students to deeply understand a problem before practicing a procedure through simple rote memorization.

Create environments where student thinking goes deeper than just surface level understanding.

QUESTIONS TO ASK, DIRECTIONS TO GIVE:

- How could you use manipulatives or a drawing to show your thinking?
- Which tool/manipulative would be best for this problem?
- What other resources help you solve this problem?
- How can you represent the problem with symbols and numbers?
- Create a representation of the problem.
- Write a number sentence to describe the situation.

WHEN CAN WE USE IT?

- Begin by shifting all fixed mindset language we hear from adults in the building such as "I'm not good at math" or "I'm just not a math person."
- Shift your actions by shifting your thinking.

Fixed Mindset	*Shifted Thinking*	**Growth Mindset**
If you hear yourself thinking "I can't do this..."	---------->	Tell yourself "I can't do this yet..."
If you hear yourself thinking "I'm no good at this..."	---------->	Tell yourself "I can become better at this."
If you hear yourself asking "What grade did I get?"	---------->	Ask instead "What can I do to improve?"

CELEBRATE THE PROCESS OVER THE PRODUCT

Teach	Encourage, reward, and celebrate	Be	Remain
Teach strategies for perseverance, such as breaking down the problem, solving what you know, using resources, asking questions, or skipping the problem and coming back to it later.	Encourage, reward, and celebrate the process over the product.	Be just as interested in how a student got an answer wrong as you are when a student gets an answer right.	Remain neutral – do not change your affect. Show you value the thinking process by asking all students to explain their thinking.

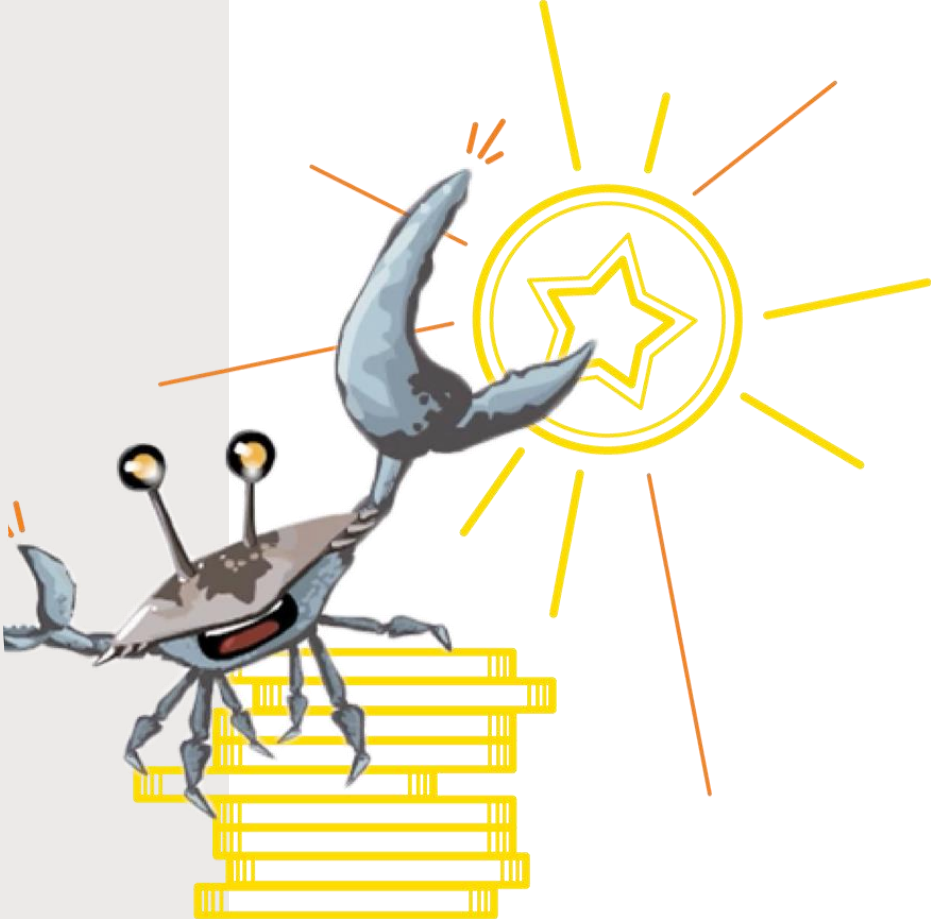
RECOMMENDED TECHNOLOGY

REFLEX

ExploreLearning Reflex helps *all* students succeed.

Adaptive and individualized, **Reflex** is the most effective system for mastering basic facts in addition, subtraction, multiplication and division for grades 2+.

Full of games that students love, Reflex takes students at every level and helps them quickly gain math fact fluency and confidence. And educators and parents love the powerful reporting that allows them to monitor progress and celebrate success.



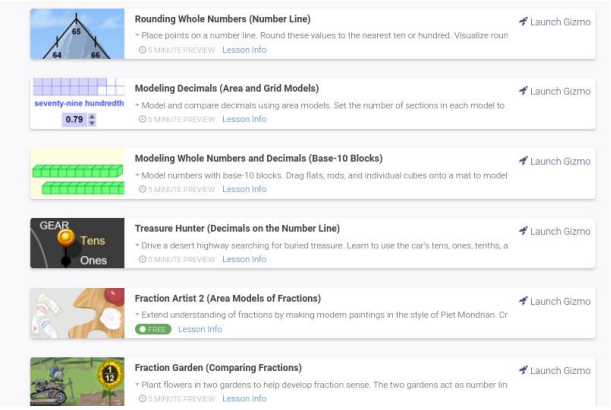
I-READY

- What is i-Ready Math?
- i-Ready Mathematics is **an online custom math curriculum that provides students of all ages with differentiated instruction and supports them on their individual paths to success.**
- Studies show that **Grades K–8 students who use i-Ready show greater improvements in math and reading than those who do not.**

IMAGINE LEARNING MATH

- Imagine Learning supports Spanish and English students in PreK–12. Our evidence-based solutions immerse students in authentic Spanish content that reflects the cultural heritage of its speakers.
- Imagine Math combines a rich curriculum, language support, and a fun adaptive digital experience to help students become confident, curious mathematicians.
- Adaptive gamification in Imagine Math Facts helps students in grades 1–5 gain automaticity in addition, subtraction, multiplication, and division.

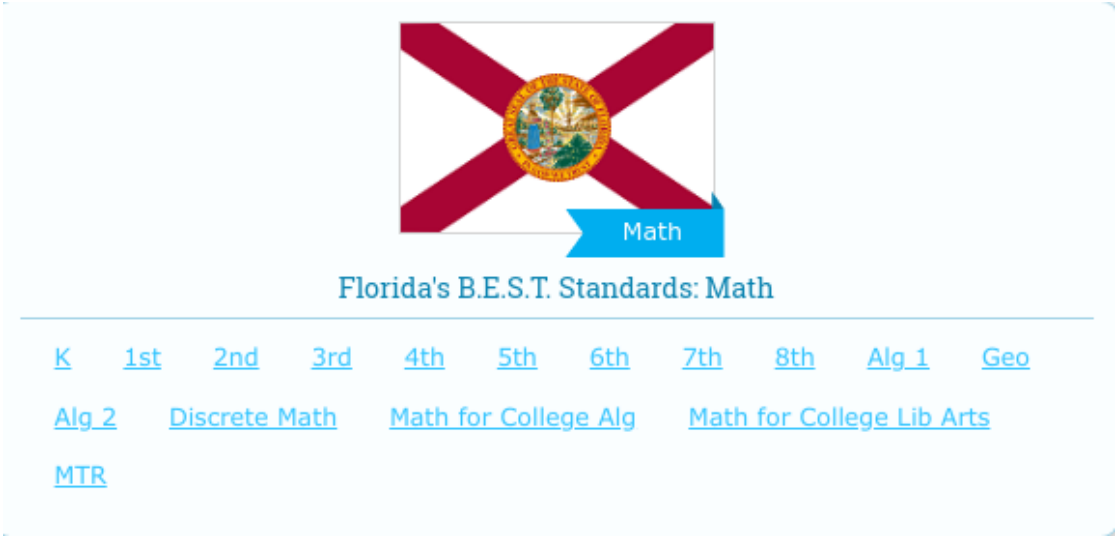
GIZMOS 3-5 GRADE



Gizmos are **virtual math and science simulations that bring powerful new interactive STEM learning experiences to grade 3-12 classrooms.**

IXL MATH

- Gain fluency and confidence in math! IXL helps students master essential skills at their own pace through fun and interactive questions, built in support, and motivating awards.



GETTING OUR STUDENTS TO SELF-MONITOR: CREATING INDEPENDENT MATHEMATICAL THINKERS