Enrichment In Common Core Math

a presentation by elizabeth sadqi, math focus teacher, pine crest elementary

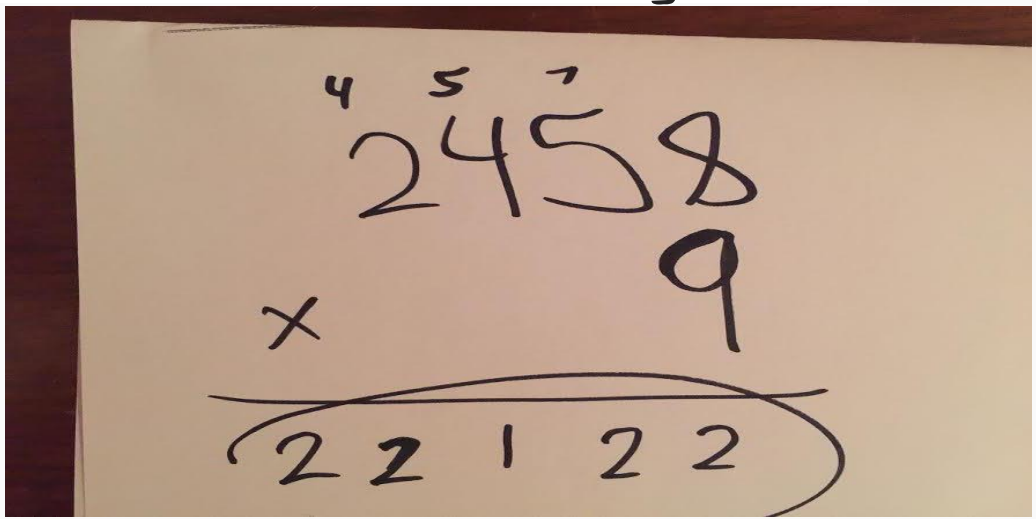
Math + Common Core = Different!

We Emphasize:

- deep understanding
  - representation
  - models
- strategies
- word problems (application)
- flexible thinking

Before Common Core

4th Grade: Standard Algorithm



Common Core: Reason and Model

Students **reason** without finding the product for 2458 x 9.

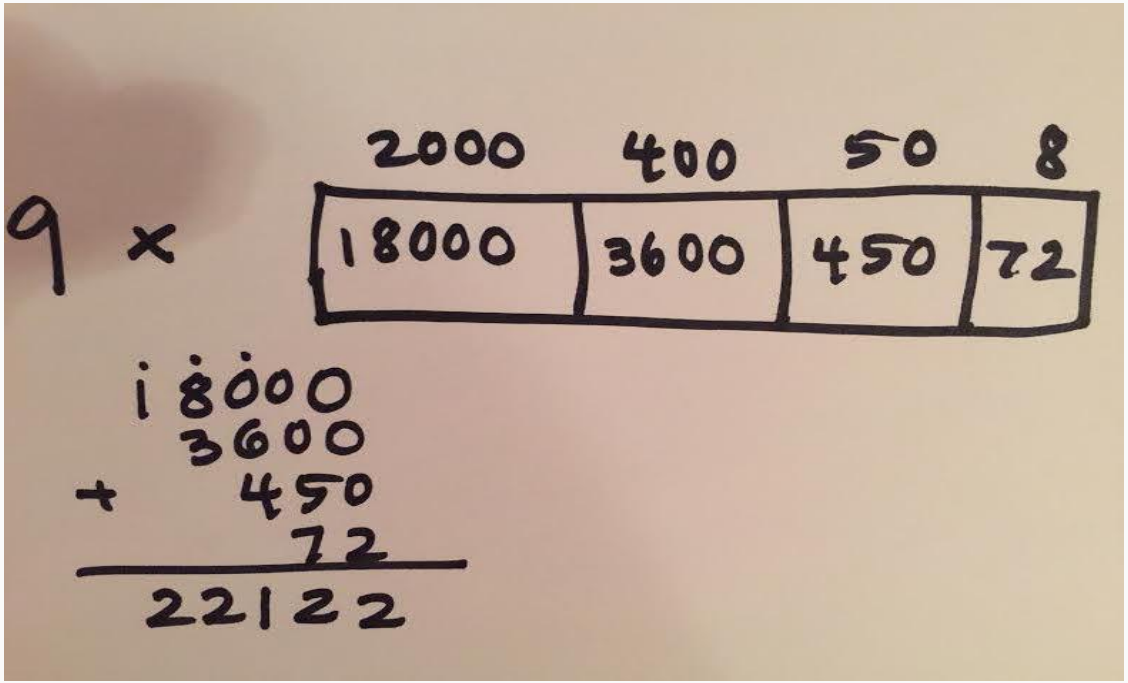
- What is a reasonable estimate?

- Will the product be even or odd?

- How could you use mental math (10 x 2458) to solve this problem?

- How can 7374 = 3 x 2458 help you to find the product of 2458 x 9?

Area Model 2458 x 9



Partial Product Model: 2458 x 9

2000 x 9 = 18000

400 x 9 = 3600

50 x 9 = 450

8 x 9 = 72

22,122

Standardized Assessment

- Students will be assessed on finding products, reading models, solving word problems, and analyzing error patterns.

Assessment Example 1

Which equation can be used to find the product of 8 and 4036?

a) $8 + 4036 = 4044$

b) $8 \times (4 + 1000 + 30 + 6) = 8{,}320$

c) $(8 + 6) \times 4630 = 56{,}420$

d) $(8 \times 4000) + (8 \times 30) + (8 \times 6) = 32{,}288$

Assessment Example 2

Mr. Sol's son lives in San Diego.

San Diego is 1739 miles from his home in Mississippi.

Mr. Sol travelled to San Diego and back 3 times last year.

How many miles did Mr. Sol travel to and from his son's home last year?

What happens when some students master the objectives faster than others?

If, prior to the end of week 2, a student demonstrates proficiency at an exceptionally thorough level with all of the following multi-digit multiplication concepts in Week 2:

- using area models and arrays to represent and explain multiplication of a 3- or 4-digit number by a 1-digit number
- using place value strategies and properties of operations to represent and explain multiplication of a 3- or 4-digit number by a 1-digit number

Then enrich learning using the following resource:

- University of Cambridge NRICH: Weekly Problem 33-2011
- Towers of Hanoi

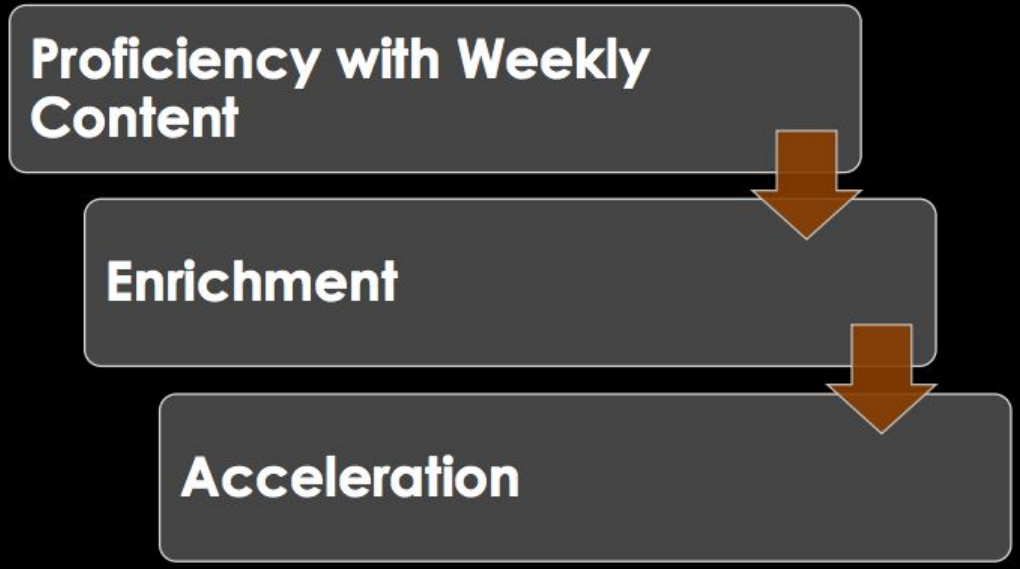
Then enrich learning using Challenging Word Problems for Grade 4

Then accelerate learning to:

- developing and applying formulas for the perimeter of a rectangle (See Marking Period 2 Week 3 Measurement and Data)
- developing and applying formulas for the area of a rectangle (See Marking Period 2 Week 3 Measurement and Data)
- measuring and applying the formula to determine the area of a rectangle (See Marking Period 2 Week 3 Measurement and Data)
- relating and applying area and perimeter formulas for rectangles to solve problems (See Marking Period 2 Week 3 Measurement and Data)

Slides 11 - 14 were taken from http://www.montgomeryschoolsmd.org/uploadedFiles/curriculum/enriched/about/MeetingNeedsHighlyAbleES.pdf

MATHEMATICS



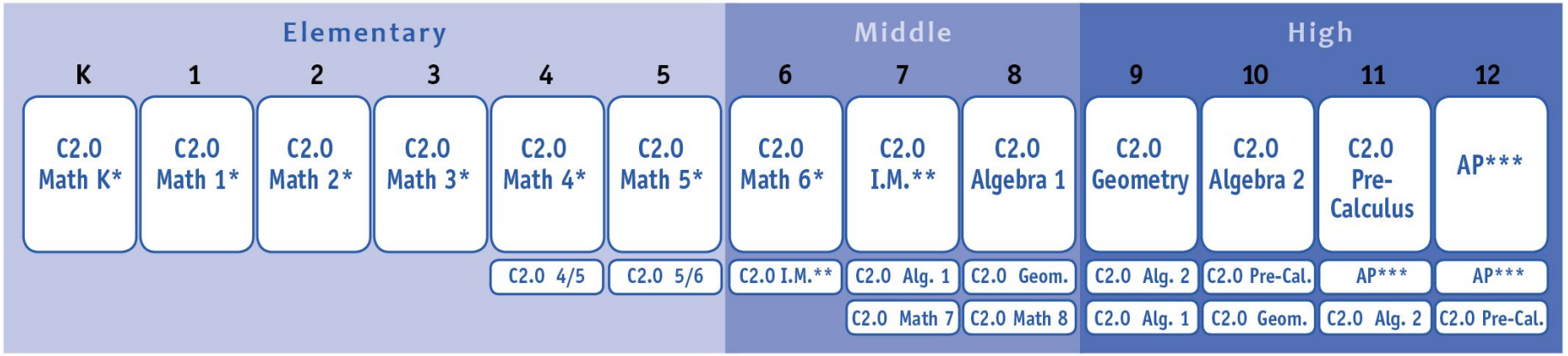
- MCPS is committed to meeting the needs of each child, including nurturing those who demonstrate exceptional proficiency in mathematics.
- Curriculum 2.0 mathematics was designed to develop a deep understanding of mathematics by building a strong foundation of number sense at the elementary level before moving into more advanced content.
- Grade-level expectations are the rigorous and internationally-benchmarked Maryland College and Career Readiness Standards (MCCRS) and the program is designed to engage all students in a mathematics program that meets their individual needs.
- Students working on grade-level mathematics are on a pathway to complete Algebra 1 by Grade 8 and will be prepared for a college-level course, such as AP Calculus or AP Statistics, before the end of high school.

PROGRAMMING FOR ENRICHMENT AND ACCELERATION

Kindergarten–Grade 3 Considerations

- Students in Kindergarten through Grade 3 should be challenged by the opportunities for enrichment and acceleration defined in the grade level curriculum.
  - Students who consistently, 70 percent or more of the time enriched and acceleration is offered, receive instruction based on the enrichment/acceleration guidelines qualify for the enrichment/acceleration designation on the report card.
  - Students who consistently demonstrates proficiency (UCARE) of all the indicators for a grade level and all the weekly acceleration and enrichment opportunities, the student may be a candidate for further challenge by the school/system.

MCPS Curriculum: Courses that lead to College/Career Readiness



* *Including MCPS enrichment and acceleration opportunities*
** *Investigations in Math*
*** *Advanced Placement Calculus, Advanced Placement Statistics, or other college-level courses*

http://www.montgomeryschoolsmd.org/curriculum/math/

ENRICHMENT AND ACCELERATION MATHEMATICS APPROACH

Enrichment

Enrichment tasks may further engage students in content from that week of instruction	**Enrichment tasks may challenge students to apply previously-taught content and skills in a novel way**	**Enrichment tasks may provide opportunities to further challenge students to apply The Mathematical Practices with content that does not directly align with specific grade-level indicators**

After students have successfully completed enrichment opportunities for a week, there may be suggestions for **acceleration** to the next logical topic in the learning progression, often in the next week of instruction.

Acceleration

Enrich!

- more depth or breadth
- alone or in groups, students solve word problems, brain teasers, related problems

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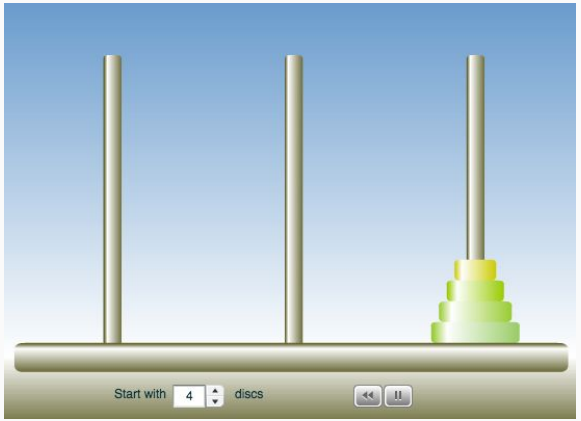

Enrichment Example 1

Jam and Egg Sandwich https://nrich.maths.org/7186

Stage: 2 and 3 Short

Each different letter in the multiplication below stands for a different digit. Identical letters stand for the same digit. Work out the value which each letter represents.

```
  E  G  G
        E   ×
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  J  A  M
```

Enrichment Example 2

***Challenging Word Problems* (Singapore Math):**

For every paper crane Lisa makes, Ali can make 2 paper cranes. If they make 1209 paper cranes all together, how many paper cranes are made by Ali?

How Parents Can Support
Talk! Play! Apply!

Talk: Ask questions and talk about math! Compare models, and talk about strategies.

- Ask "Why?" and "What if?"

Play: math games online or on the table

- coolmath4kids.com or Think Fun! games http://thinkfun.com/our-products/ (Rush Hour, Chocolate Fix, more)

Apply: math to STEM activities, household projects, sports; etc.

Apply math skills in less-familiar contexts

Resist: the urge to accelerate!