Math that Matters

SMS Math

May 8th and 9th, 2014

CCRS Implementation

CCRS Lesson Discussion

SMP Review

The Eight Standards for Mathematical Practice

Standard 1:	Make sense of problems and persevere in solving them.
Standard 2:	Reason abstractly and quantitatively.
Standard 3:	Construct viable arguments and critique the reasoning of others.
Standard 4:	Model with mathematics.
Standard 5:	Use appropriate tools strategically.
Standard 6:	Attend to precision.
Standard 7:	Look for and make use of structure.
Standard 8:	Look for and express regularity in repeated reasoning.

SMP Discussion

Questioning

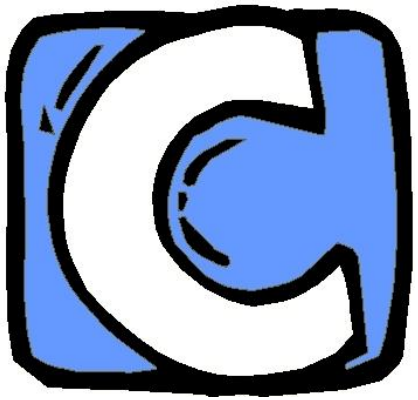
Y. Epp

How has your questioning changed in the classroom since our last meeting?

What are you finding is still difficult?

What are some of the things that make an effective question?

Rigor

I Choose 

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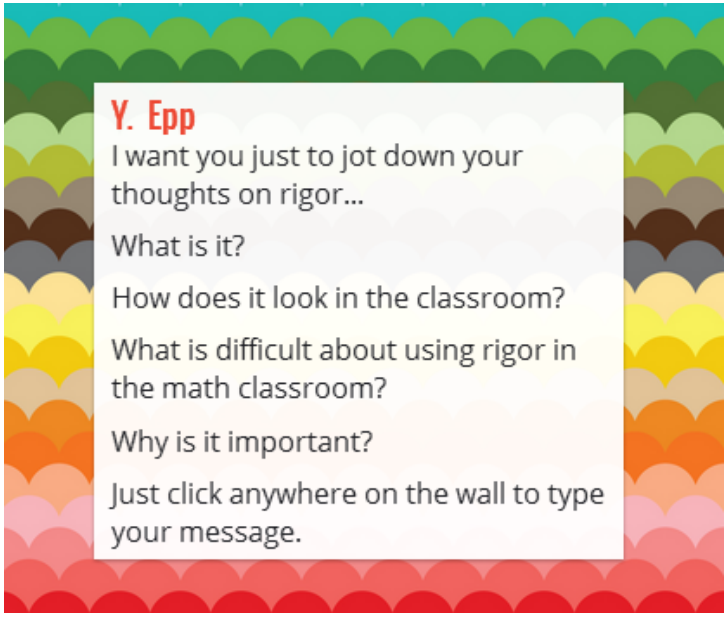

Y. Epp
I want you just to jot down your thoughts on rigor...
What is it?
How does it look in the classroom?
What is difficult about using rigor in the math classroom?
Why is it important?
Just click anywhere on the wall to type your message.

What is Rigor?

"Students should have frequent opportunities to formulate, grapple with, talk about and solve complex problems that require a significant amount of effort and should then be encouraged to reflect on their thinking."

NCTM (2000) Principles and Standards

Webb's Depth of Knowledge

When I hear....

There is a difference between difficulty and complexity, I think....

DOK Is NOT about Difficulty

Difficulty is a reference to how many students answer a question correctly.

How many of you know the definition of

dissolve?

DOK Is NOT about Difficulty

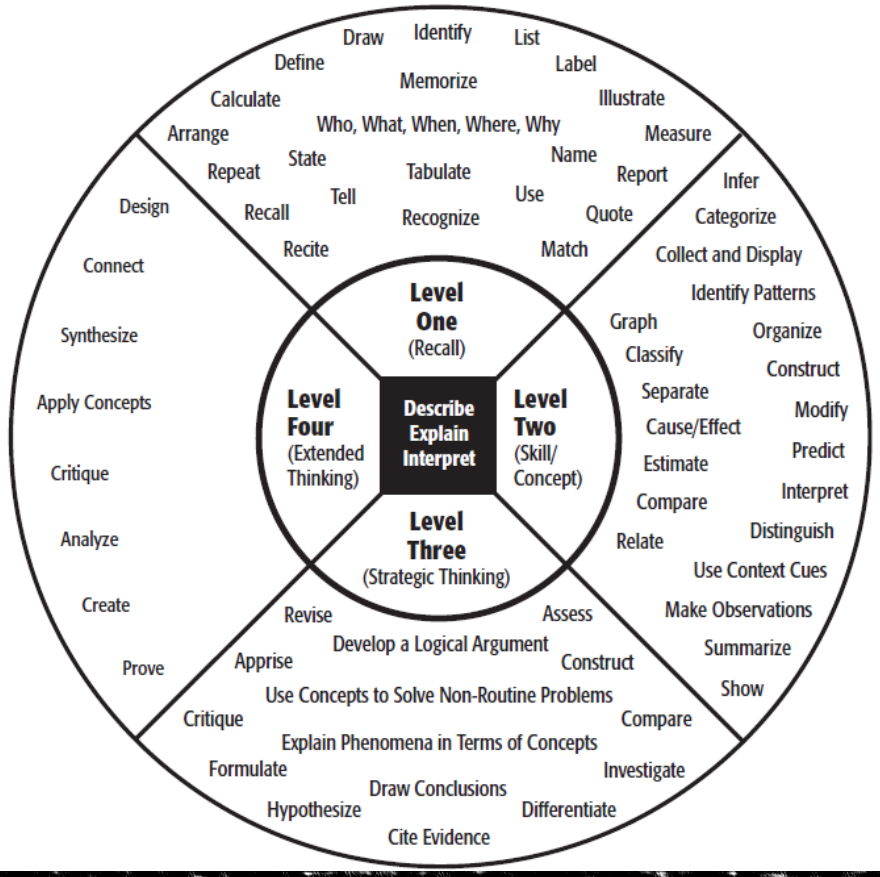
Difficulty is a reference to how many students answer a question correctly.

How many of you know the definition of

evinces?

Rigor Vs. Difficulty

Web's DOK Levels



DOK Is About Depth and Complexity – Not Difficulty

The intended student learning outcome determines the DOK level. What mental processing must occur?

While verbs may appear to point to a DOK level, it is what comes after the verb that is the best indicator of the rigor/DOK level.

DOK Is About Depth and Complexity – Not Difficulty

Describe the process of photosynthesis.

Describe/Explain the steps in long division

Describe how the two political parties are alike and different.

Describe the most significant effect of WWII on the nations of Europe.

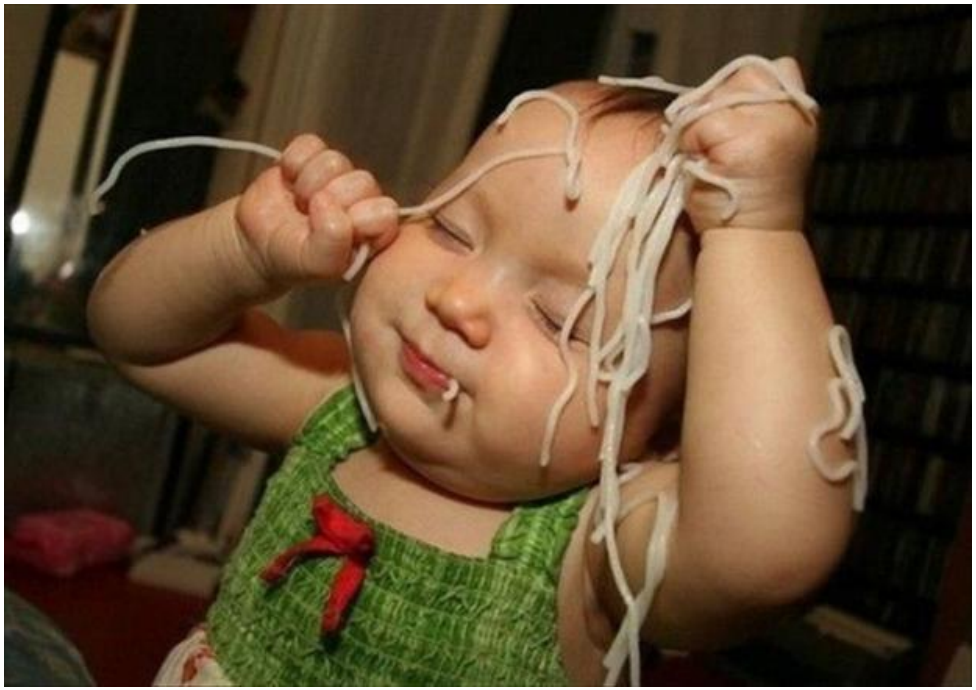
DOK Is NOT...

Determined by verb choice

The same as difficulty level

Going up a grade level

Lunch




verizon
Make progress every day

Dr. Bice's 5 Absolutes

Dr. Bice's Absolutes...

1. **Teach to the standard.** This sounds so very simple but in practice it requires a deep understanding of content and its relationship to the real world. It requires understanding what the knowledge and skill set of a student looks like when they meet the standard, and it cannot be fully realized with a heavy reliance on a textbook or some other single resource. What I can say with absolute certainty is that if we teach to the standard and the assessments we give are aligned to those standards, the test should no longer be the focus.

So how do we get there?

Critical Areas AKA Focus Standards

Domain: **Ratios and Proportional Relationships (RP)**

Cluster: Understand ratio concepts and use ratio reasoning to solve problems.

Standard: **6.RP.1**. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*

Standards for Mathematical Practice (MP):

MP.2. Reason abstractly and quantitatively.
MP.6. Attend to precision

Connections:

This cluster is connected to the Grade 6 Critical Area of Focus #1, **Connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems.**

In Grade 6, students develop the foundational understanding of ratio and proportion that will be extended in Grade 7 to include scale drawings, slope and real-world percent problems.

Explanations and Examples

6.RP.1 A ratio is the comparison of two quantities or measures. The comparison can be part-to-whole (ratio of guppies to all fish in an aquarium) or part-to-part (ratio of guppies to goldfish). Students need to understand each of these ratios when expressed in the following forms: , 6 to 15 or 6:15. These values can be *simplified to , 2 to 5 or 2:5; however, students would need to understand how the simplified value*s relate to the original numbers.

A rate is a ratio where two measurements are related to each other. When discussing

Instructional Strategies - 6.RP.1-3

Proportional reasoning is a process that requires instruction and practice. It does not develop over time on its own. Grade 6 is the first of several years in which students develop this multiplicative thinking. Examples with ratio and proportion must involve measurements, prices and geometric contexts, as well as rates of miles per hour or portions per person within contexts that are relevant to sixth graders. Experience with proportional and nonproportional relationships, comparing and predicting ratios, and relating unit rates to previously learned unit fractions will facilitate the development of proportional reasoning. Although algorithms provide efficient means for finding solutions, the cross-product algorithm commonly used for solving proportions will not aid in the development of proportional reasoning. Delaying the introduction of rules and algorithms will encourage thinking about multiplicative situations instead of indiscriminately applying rules.

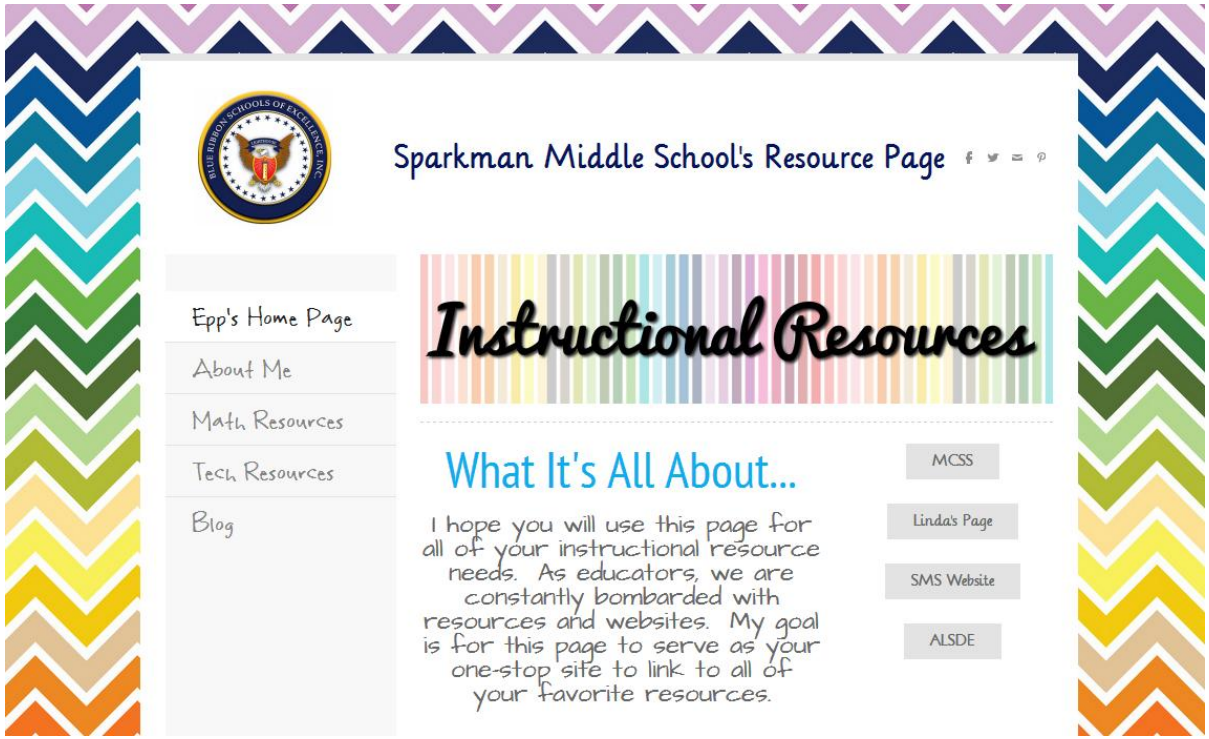
Common Misconceptions:

Fractions and ratios may represent different comparisons. Fractions always express a part-to-whole comparison, but ratios can express a part-to-whole comparison or a part-to-part comparison which can be written as: a to b, $\frac{a}{b}$, or $a{:}b$.

Even though ratios and fractions express a part-to-whole comparison, the addition of ratios and the addition of fractions are distinctly different procedures. When adding ratios, the parts are added, the wholes are added and then the total part is compared to the total whole. For example, (2 out of 3 parts) + (4 out of 5 parts) is equal to six parts out of 8 total parts (6 out of 8) if the parts are equal. When dealing with fractions, the procedure for addition is based on a common denominator: (2/3) + (4/5) = (10/15) + (12/15) which is equal to (22/15). Therefore, the addition process for ratios and for fractions is distinctly different.

Often there is a misunderstanding that a percent is always a natural number less than or equal to 100. Provide examples of percent amounts that are greater than 100%, and percent amounts that are less 1%.

Website


Sparkman Middle School's Resource Page
Epp's Home Page
About Me
Math Resources
Tech Resources
Blog
Instructional Resources
What It's All About...
I hope you will use this page for all of your instructional resource needs. As educators, we are constantly bombarded with resources and websites. My goal is for this page to serve as your one-stop site to link to all of your favorite resources.
MCSS
Linda's Page
SMS Website
ALSDE

Plan and Collaborate