Common Core State Standards Instructional Shifts:

FOCUS

First Grade

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CCSS-Mathematics Overview

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What I already know about the Common Core State Standards.	What I would like to learn about the Common Core State Standards.	What I learned today about the CCSS and how I can apply this knowledge in my classroom.

Focus

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Overview of the CCSS

http://engageny.org/resource/common-core-in-mathematics-overview

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Why Common Core?

Initiated by the National Governors Association (NGA) and Council of Chief State School Officers (CCSSO) with the following design principles:

- Result in College and Career Readiness
- Based on solid research and practice evidence
- Fewer, higher and clearer

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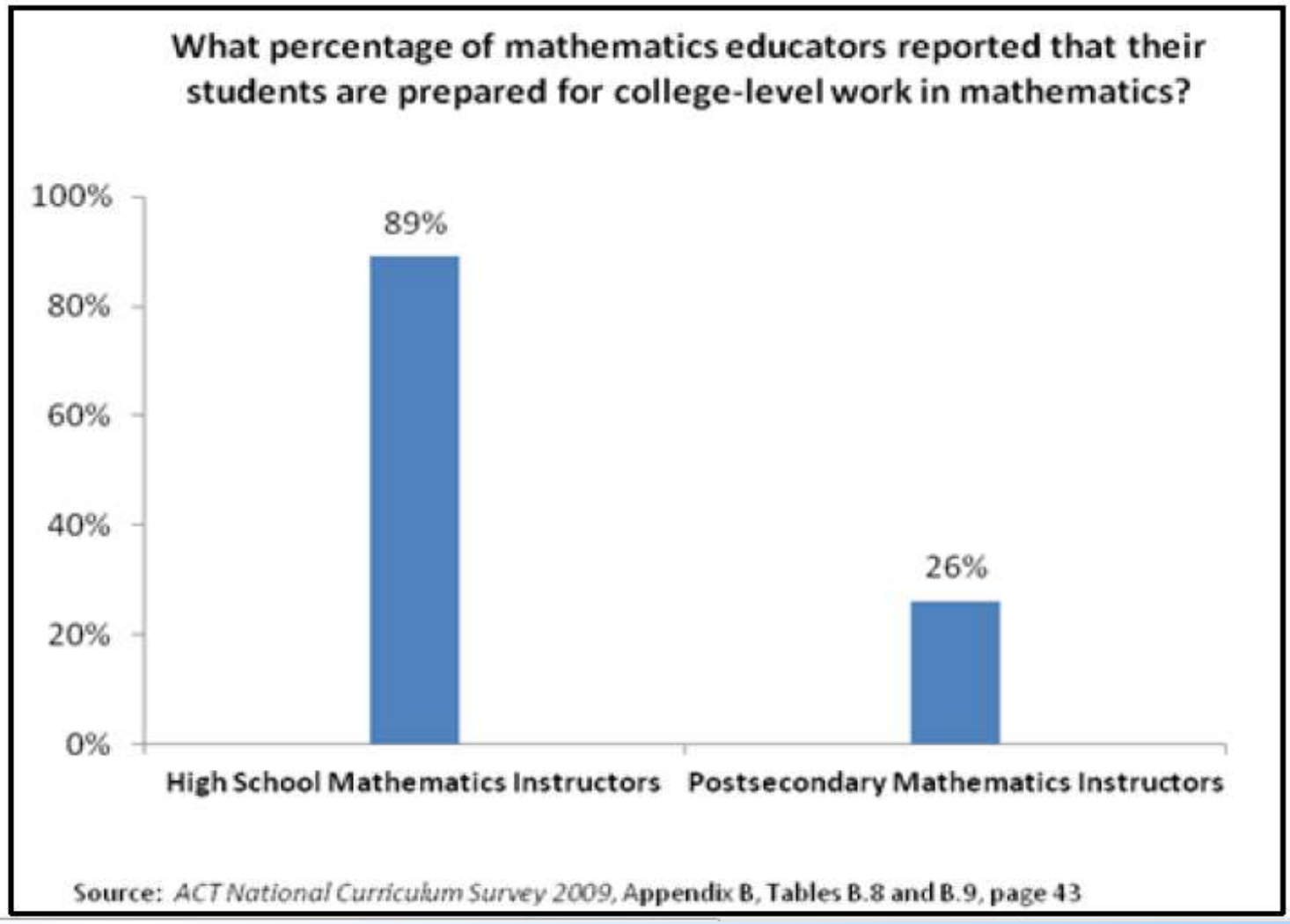

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What The Disconnect Means for Students

- Nationwide, many students in both 2 and 4 year colleges need remediation in math.
- Students who take remedial classes have lower odds of finishing their degree or program.

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Common Core State Standards for Mathematics: Three Key Shifts

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CCSS Shifts Background

1. **Focus:** Focus strongly where the standards focus.

2. **Coherence**: **Think** across grades, and **link** to major topics.

3. **Rigor:** In major topics, pursue **conceptual understanding,** procedural skill and **fluency,** and **application.**

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The Why: Shift One
Focus strongly where the Standards focus

- Significantly narrow the scope of content and deepen how time and energy is spent in the math classroom.

- Focus deeply only on what is emphasized in the standards, so that students gain strong foundations.

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The Why: Shift Two
Coherence Think across grades, and link to major topics within grades

- Carefully connect the learning within and across grades so that students can build new understanding onto foundations built in previous years.
- Begin to count on solid conceptual understanding of core content and build on it. Each standard is not a new event, but an extension of previous learning.

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The Why: Shift Three

Rigor In major topics, pursue conceptual understanding, procedural skill and fluency, and application

- The CCSSM require a balance of:
  - Solid conceptual understanding
  - Procedural skill and fluency
  - Application of skills in problem solving situations
- This requires equal intensity in time, activities, and resources in pursuit of all three.

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A Closer Look at: Focus

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CCSS: Focus

http://engageny.org/resource/common-core-in-mathematics-shift-1-focus

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Focus

- Move away from **"mile wide, inch deep"** curricula identified in TIMSS
- Learn from international comparisons
- Teach less, learn more
- “Less topic coverage can be associated with higher scores on those topics covered because students have more time to master the content that is taught”

– Ginsburg et al., 2005

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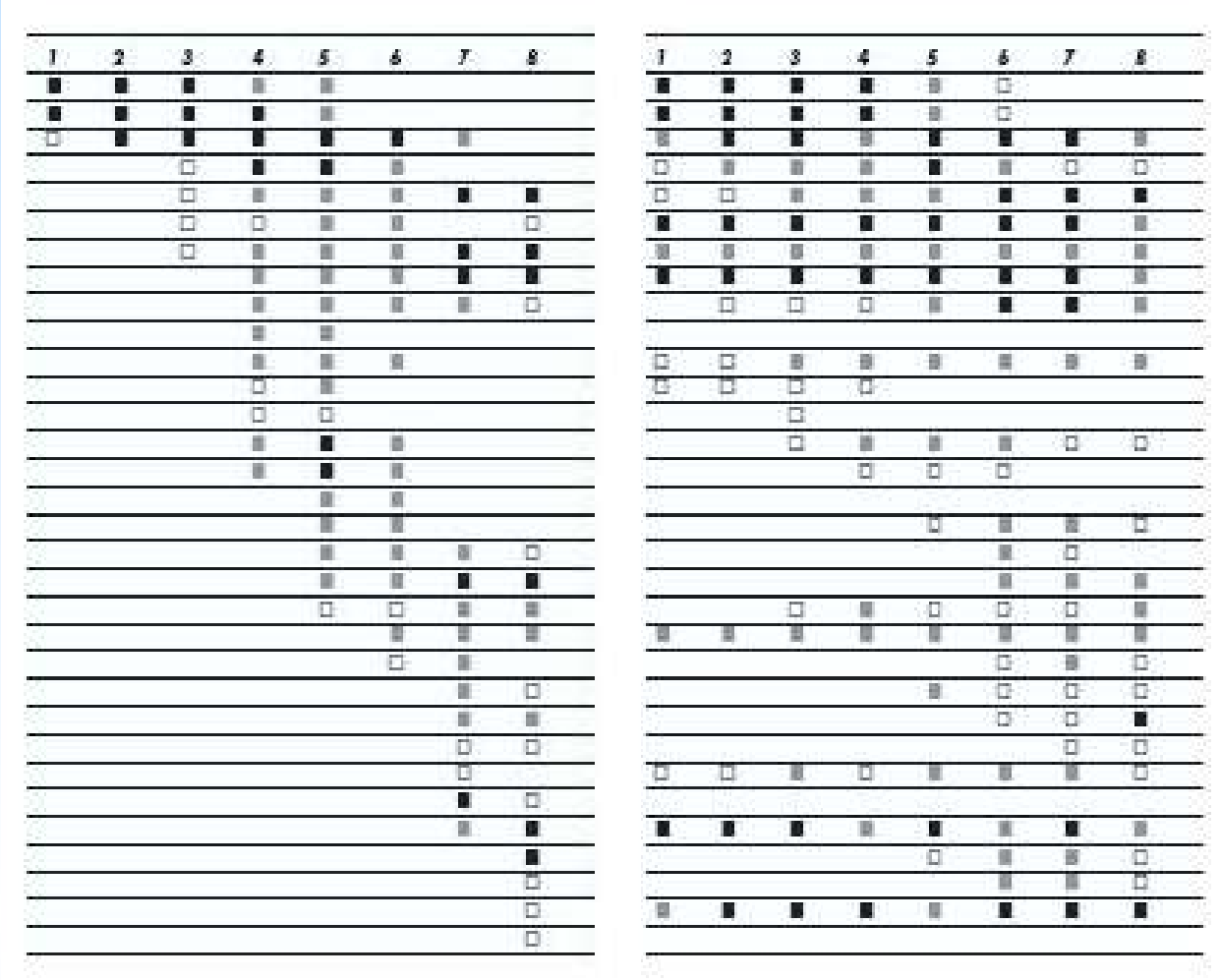
The shape of math in A+ countries

Mathematics topics intended at each grade by at least two-thirds of A+ countries

Mathematics topics intended at each grade by at least two-thirds of 21 U.S. states



[1] *Schmidt, Houang, & Cogan, "A Coherent Curriculum: The Case of Mathematics." (2002).*

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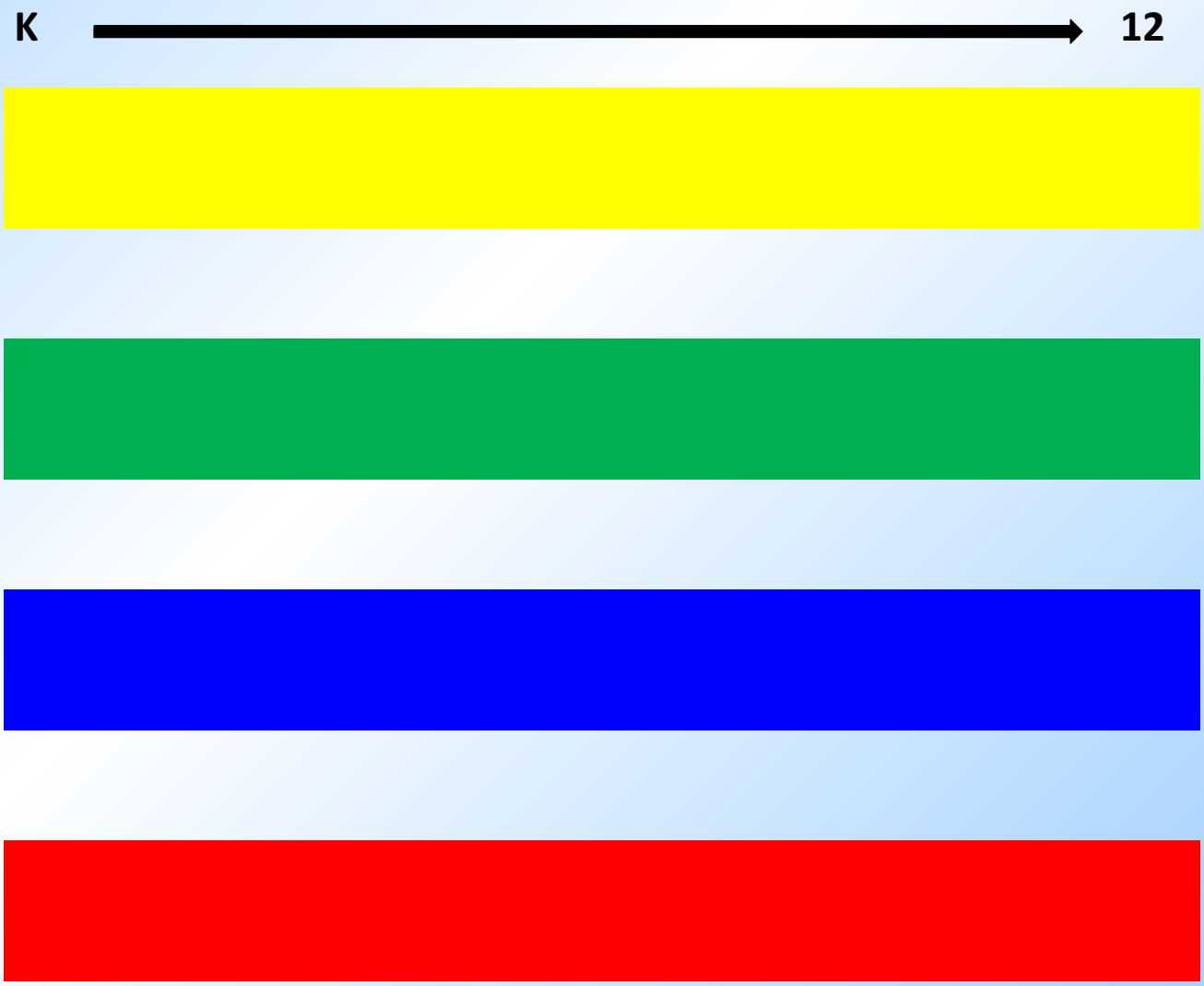
Traditional U.S. Approach



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Math Common Core Standards Progressions K-12

K	1	2	3	4	5	6	7	8	9-12
Counting and Cardinality									Number and Quantity
Number and Operations in Base Ten						Ratios and Proportional Relationships			
			Number and Operations: Fractions			The Number System			
Operations and Algebraic Thinking						Expressions and Equations			Algebra
								Functions	
Geometry						Geometry			
Measurement and Data						Statistics and Probability			

The Hunt Institute

http://www.youtube.com/watch?v=2rje1NOgHWs&list=UUF0pa3nE3aZAfBMT8pqM5PA&index=18&feature=plcp

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Focus in Math

- Focus deeply on only those concepts that are emphasized in the standards.
- Enable students to gain a conceptual understanding of math to ensure a strong foundation.
- Make certain students have a high degree of procedural skill and fluency.
- Ensure their ability to apply the math they know to solve problems inside and outside the math classroom.

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Prioritize Standards

- Not all Standards are created equal

Key: Major Clusters; Supporting Clusters; Additional Clusters

Operations and Algebraic Thinking

- **Represent and solve problems involving addition and subtraction.**
- **Understand and apply properties of operations and the relationship between addition and subtraction.**
- **Add and subtract within 20.**
- **Work with addition and subtraction equations.**

Number and Operations in Base Ten

- **Extending the counting sequence.**
- **Understand place value.**
- **Use place value understanding and properties of operations to add and subtract.**

Measurement and Data

- **Measure lengths indirectly and by iterating length units.**
- **Tell and write time.**
- **Represent and interpret data.**

Geometry

- **Reason with shapes and their attributes.**

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Key Areas of Focus in Mathematics

Grade	Focus Areas in Support of Rich Instruction and Expectations of Fluency and Conceptual Understanding
K–2	Addition and subtraction – concepts, skills, and problem solving and place value
3–5	Multiplication and division of whole numbers and fractions – concepts, skills, and problem solving

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Required Fluencies in K-6

Grade	Standard	Required Fluency
K	K.OA.5	Add/subtract within 5
1	1.OA.6	Add/subtract within 10
2	2.OA.2 2.NBT.5	Add/subtract within 20 (know single-digit sums from memory) Add/subtract within 100
3	3.OA.7 3.NBT.2	Multiply/divide within 100 (know single-digit products from memory) Add/subtract within 1000
4	4.NBT.4	Add/subtract within 1,000,000
5	5.NBT.5	Multi-digit multiplication
6	6.NS.2, 6.NS.3	Multi-digit division Multi-digit decimal operations

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Focus in First Grade

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Domains

- Numbers and Operations in Base Ten (NBT)
- Operations and Algebraic Thinking (OA)
- Measurement and Data (MD)
- Geometry (G)

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NBT- Example

Use place value understanding and properties of place value to add and subtract .

1.NBT.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

First Grade students use concrete models, drawings and place value strategies to subtract multiples of 10 from decade numbers (e.g., 30, 40, 50). They often use similar strategies as discussed in 1.OA.4.

Example: **There are 60 students in the gym. 30 students leave. How many students are still in the gym?**

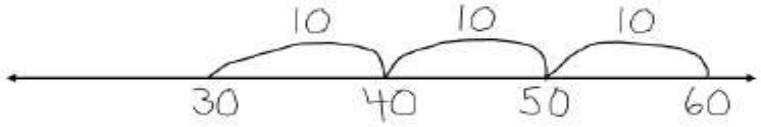
Student A

I used a number line. I started at 60 and moved back 3 jumps of 10 and landed on 30. There are 30 students left.

60 – 10 = 50

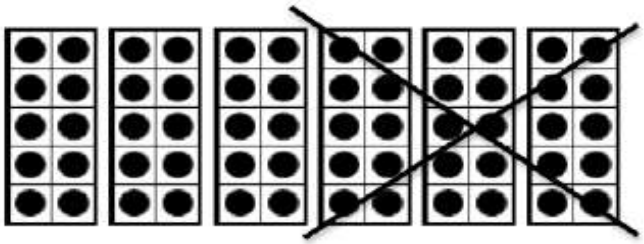
50 – 10 = 40

40 – 10 = 30



Student B

I used ten frames. I had 6 ten frames- that's 60. I removed three ten frames because 30 students left the gym. There are 30 students left in the gym.



60 – 30 = 30

Student C

I thought, "30 and what makes 60?". I know 3 and 3 is 6. So, I thought that 30 and 30 makes 60. There are 30 students still in the gym.

30 + 30 = 60

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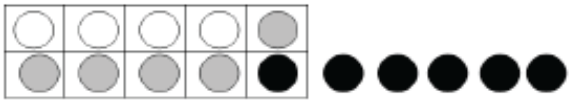
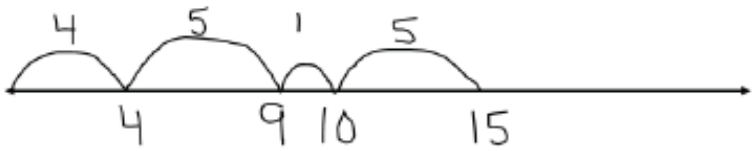
OA- Example

Represent and solve problems involving addition and subtraction.

1.OA.2 Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	First Grade students solve multi-step word problems by adding (joining) three numbers whose sum is less than or equal to 20, using a variety of mathematical representations. Example: **Mrs. Smith has 4 oatmeal raisin cookies, 5 chocolate chip cookies, and 6 gingerbread cookies. How many cookies does Mrs. Smith have?** Student A: I put 4 counters on the Ten Frame for the oatmeal raisin cookies. Then, I put 5 different color counters on the ten frame for the chocolate chip cookies. Then, I put another 6 color counters out for the gingerbread cookies. Only one of the gingerbread cookies fit, so I had 5 leftover. Ten and five more makes 15 cookies. Mrs. Smith has 15 cookies. 4 + 5 + 6 = ☼  Student B: I used a number line. First I jumped to 4, and then I jumped 5 more. That's 9. I broke up 6 into 1 and 5 so I could jump 1 to make 10. Then, I jumped 5 more and got 15. Mrs. Smith has 15 cookies.  4 + 5 + 6 = ☼ Student C: I wrote: 4 + 5 + 6 = □. I know that 4 and 6 equals 10, so the oatmeal raisin and gingerbread equals 10 cookies. Then I added the 5 chocolate chip cookies. 10 and 5 is 15. So, Mrs. Smith has 15 cookies.

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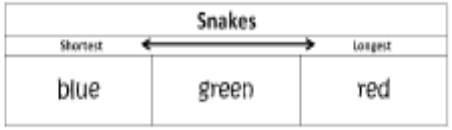
MD- Example

Measure lengths indirectly and by iterating length units.

1.MD.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object.	First Grade students continue to use direct comparison to compare lengths. *Direct* comparison means that students compare the amount of an attribute in two objects without measurement. Example: **Who is taller?** **Student**: Let's stand back to back and compare our heights. Look! I'm taller! Example: **Find at least 3 objects in the classroom that are the same length as, longer than, and shorter than your forearm.** Sometimes, a third object can be used as an intermediary, allowing *indirect* comparison. For example, if we know that Aleisha is taller than Barbara and that Barbara is taller than Callie, then we know (due to the transitivity of "taller than") that Aleisha is taller than Callie, even if Aleisha and Callie never stand back to back. This concept is referred to as the transitivity principle for indirect measurement. Example: **The snake handler is trying to put the snakes in order- from shortest to longest. She knows that the red snake is longer than the green snake. She also knows that the green snake is longer than the blue snake. What order should she put the snakes?** **Student**: Ok. I know that the red snake is longer than the green snake and the blue snake because, since it's longer than the green, that means that it's also longer than the blue snake. So the longest snake is the red snake. I also know that the green snake and red snake are both longer than the blue snake. So, the blue snake is the shortest snake. That means that the green snake is the medium sized snake. 

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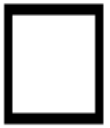
NC CCSS 1st grade Unpacked

G- Example

Measure lengths indirectly and by iterating length units.

1.G.1 Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size) ; build and draw shapes to possess defining attributes.	First Grade students use their beginning knowledge of defining and non-defining attributes of shapes to identify, name, build and draw shapes (including triangles, squares, rectangles, and trapezoids). They understand that defining attributes are always-present features that classify a particular object (e.g., number of sides, angles, etc.). They also understand that non-defining attributes are features that may be present, but do not identify what the shape is called (e.g., color, size, orientation, etc.). Example: All triangles must be closed figures and have 3 sides. These are defining attributes. Triangles can be different colors, sizes and be turned in different directions. These are non-defining attributes. **Student** I know that this shape is a triangle because it has 3 sides. It's also closed, not open.  **Student** I used toothpicks to build a square. I know it's a square because it has 4 sides. And, all 4 sides are the same size.  TEACHER NOTE: In the U.S., the term "trapezoid" may have two different meanings. Research identifies these as inclusive and exclusive definitions. The inclusive definition states: A trapezoid is a quadrilateral with *at least* one pair of parallel sides. The exclusive definition states: **A trapezoid is a quadrilateral with *exactly* one pair of parallel sides**. With this definition, a parallelogram is not a trapezoid. North Carolina has adopted the exclusive definition. (*Progressions for the CCSSM: Geometry*, The Common Core Standards Writing Team, June 2012.)

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Fluency

- Add and subtract within 10

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Group Discussion

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Shift One: Focus strongly where the Standards focus

Question One*:*

"Why focus? There's so much math that students could be learning, why limit them to just a few things?"

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Shift One: Focus strongly where the Standards focus

Question Two:

"What are the four domains that are the focus in first grade? Kindergarten has one additional focus. What is that domain?

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Shift One: Focus strongly where the Standards focus

Question Three:

"Why are some clusters focused upon more heavily than others, in particular in First Grade? How does this impact your planning of lessons for the school year with your students?

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Shift One: Focus strongly where the Standards focus

Question Four*:*

"How does looking at the examples of CCSS-M Unpacked at the First Grade level help to clarify your understanding of the focus of the Common Core State Standards?

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What I already know about the Common Core State Standards.	What I would like to learn about the Common Core State Standards.	What I learned today about the CCSS and how I can apply this knowledge in my classroom.

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Focus

Resources

- www.corestandards.org
- http://ime.math.arizona.edu/progressions/
- www.insidemathematics.org
- www.teachingchannel.org
- www.achievethecore.org
- www.illustrativemathematics.org
- commoncoretools.me

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Next Steps?

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