A Common Sense Approach to the Common Core

Math 6 – 8

Characteristics of the Common Core Standards…

- **Fewer and more rigorous standards**
- **Aligned with college and career expectations – prepare all students for success after high school**
- **Internationally benchmarked so that all of our students are prepared to succeed globally**
- **Rigorous content and applications of higher order thinking skills**
- **Builds on strengths and lessons of current state standards**
- **Consistent from state to state**
- **Research based**

Math teaches us more than just content

Standards for Mathematical Practice

- **Make sense of problems and persevere in solving them.**
- **Reason abstractly and quantitatively.**
- **Construct viable arguments and critique the reasoning of others.**
- **Model with mathematics.**
- **Use appropriate tools strategically.**
- **Attend to precision.**
- **Look for and make use of structure.**
- **Look for and express regularity in repeated reasoning.**

How has Math Instruction Changed…

Students will learn ***more*** about ***fewer topics***

- In Class…
  - Student will focus on fewer topics.
- At Home…
  - Parents can become familiar with the main topics of instruction

Students will learn ***more*** about ***fewer topics***… Grade 6

Ratios and Proportional Relationships

- Understand ratio concepts and use ratio reasoning to solve problems.

The Number System

- Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
- Work with positive and negative numbers.

Expressions and Equations

- Work with variables and expressions by generalizing how numbers work: $x + y = y + x$
- Reason about and solve one-step equations and inequalities.

Students will learn ***more*** about ***fewer topics***… Grade 7

Ratios and Proportional Relationships

- Analyze proportional relationships and use them to solve real-world and mathematical problems.
- Solve percent problems

The Number System

- Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide integers.

Expressions and Equations

- Use properties of operations to generate equivalent expressions.
- Solve real world problems using numerical and algebraic expressions and equations.

Students will learn ***more*** about ***fewer topics***… Grade 8

Expressions and Equations

- Work with radicals and integer exponents.
- Understand the connections between proportional relationships, lines, and linear equations.
- Analyze and solve linear equations and pairs of simultaneous linear equations.

Functions

- Define, evaluate, and compare functions.

Geometry

- Understand and apply the Pythagorean Theorem.
- Understand congruence and similarity using physical models, transparencies, or geometry software.

How has Math Instruction Changed…

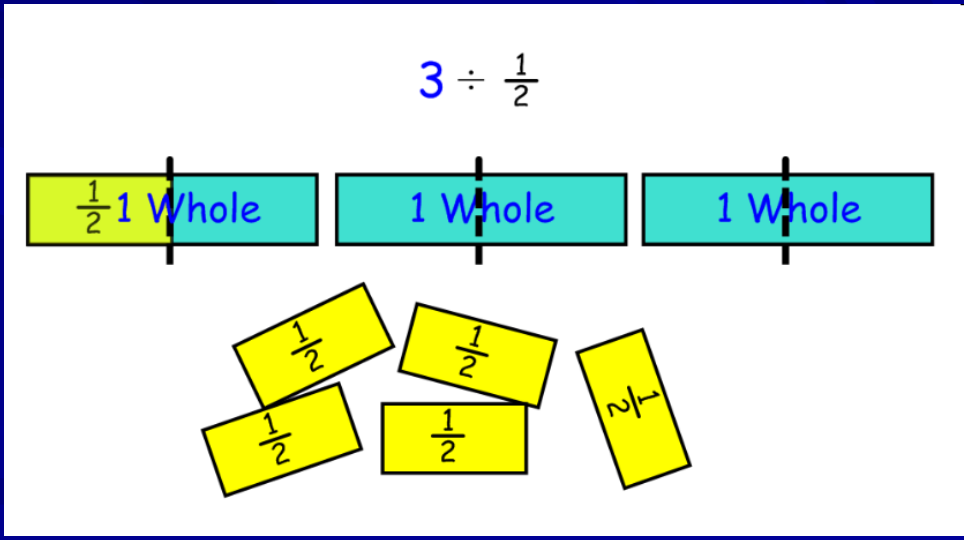
Skills are developed ***<u>across grades</u>***

- In Class…
  - Student will build new ideas from earlier topics
- At Home…
  - Parents can understand how these skills are connected
  - Be aware of topics of difficulty

Skills are developed ***across grades***…
(Numbers and Operations)

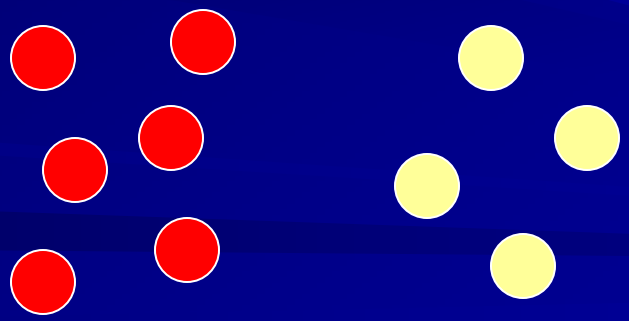
- Grade 5:
  - Add/Subtract/Multiply fractions.
  - Division with unit fractions (1/x)

- Grade 6:
  - Divide fractions and decimals



Skills are developed ***across grades***…
(Numbers and Operations)

- Grade 6:
  - Introduction to negative numbers.
- Grade 7:
  - Use objects to represent operations with integers and explain why the standard algorithms work



-6 + 4 = -2

Skills are developed ***across grades***…
(Numbers and Operations)

- Grade 6:
  - Introduction to negative numbers.
- Grade 7:
  - Use objects to represent operations with integers and explain why the standard algorithms work
- Grade 8:
  - Use the Pythagorean theorem to introduce the concept of irrational numbers

Skills are developed ***across grades***…
(Ratios and Rates)

- Grade 5:
  - Recognize patterns in tables
- Grade 6:
  - Understand the concept of rates and unit rates

Weight (lb.)	Cost ($)
1	3
2	6
3	9
4	12
5	15
6	18

Skills are developed ***across grades***…
(Ratios and Rates)

- Grade 7:
  - Use unit rates and proportional reasoning
- Grade 8:
  - Recognize the slope of a function as the rate of change (unit rate)

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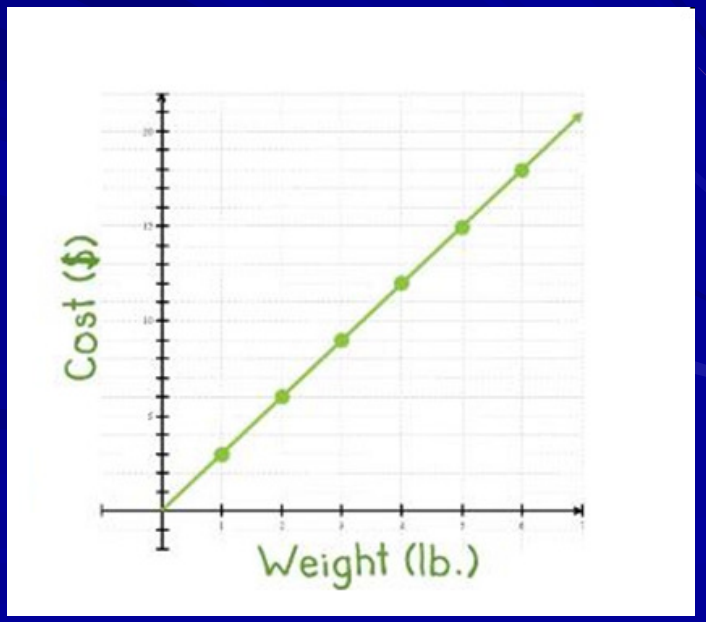


Skills are developed ***across grades***…
(Ratios and Rates)

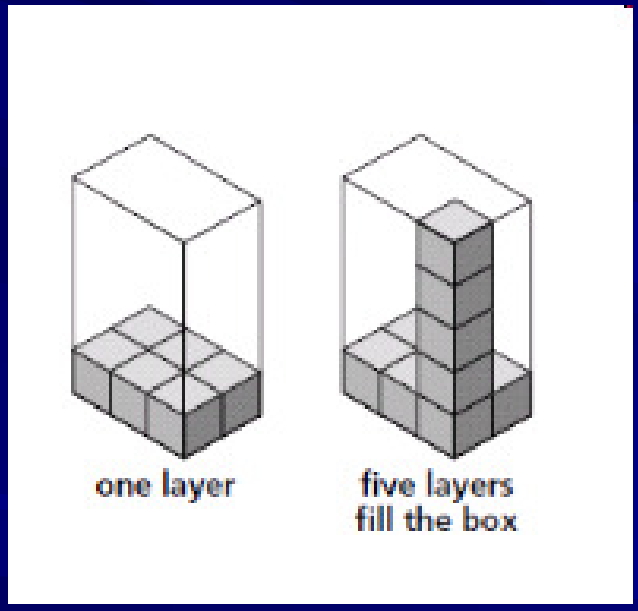
- Grade 6:
  - *"The ratio of flour to sugar is 3:4. How much flour will we need if we use 1 cup of sugar?""*
- Grade 7:
  - *"A person walks 1/2 mile in each 1/4 hour, compute the unit rate in miles per hour. At this rate, how far will the person walk in 1 ½ hours?"*
- Grade 8:
  - *"A person is walking 2 miles per hour. This is represented by the equation… d = 2t… y = 2x"*

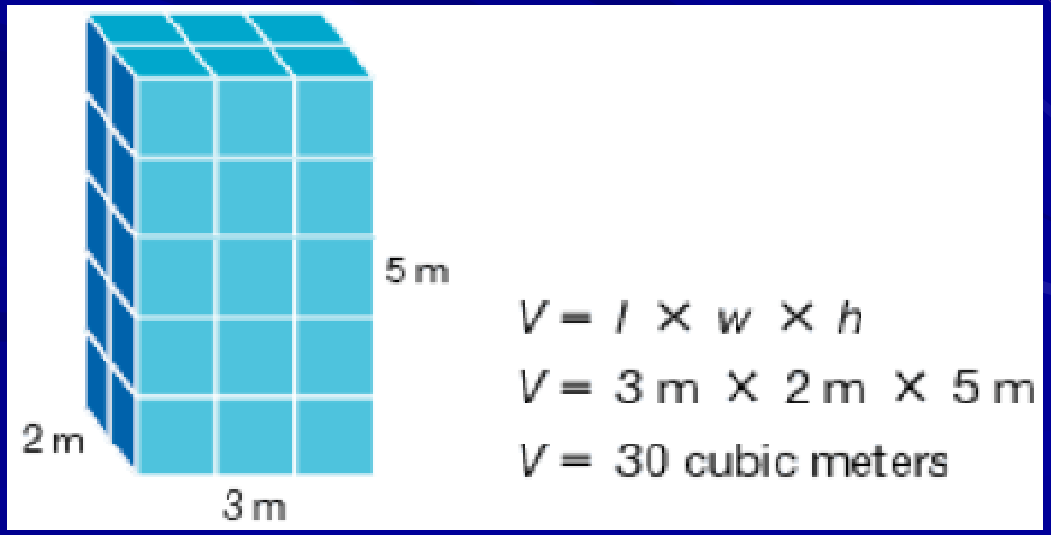
Skills are developed ***across grades***…
(Geometry)

- Grade 5:
  - Introduction to the meaning of volume
- Grade 6:
  - Recognize the difference between volume and surface area of rectangular and triangular prisms.
- Grade 7:
  - Compare volume and surface area of cylinders to that of rectangular prisms
- Grade 8:
  - Volumes of cones and spheres

Skills are developed ***across grades***…
(Geometry)

- Grade 5:
  - Introduction to the meaning of volume





Skills are developed ***across grades***…
(Geometry)

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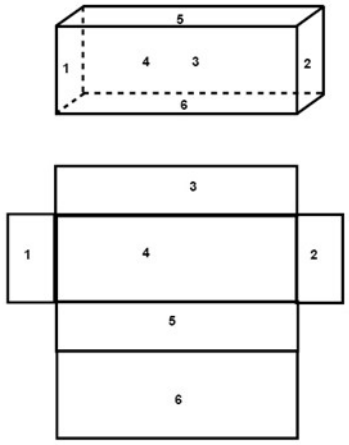
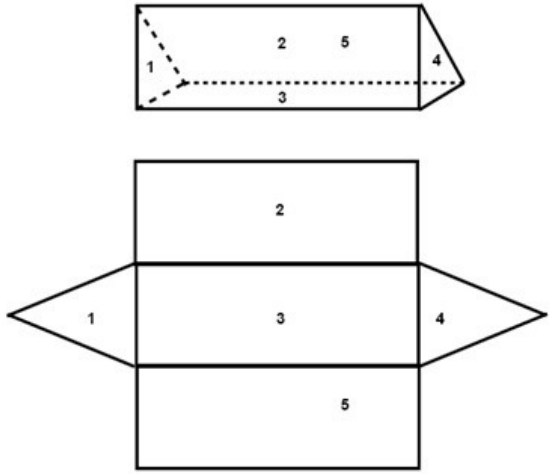




Skills are developed ***across grades***…
(Geometry)

- Grade 7:
  - Derivation of the relationship between the circumference, area and diameter of a circle.

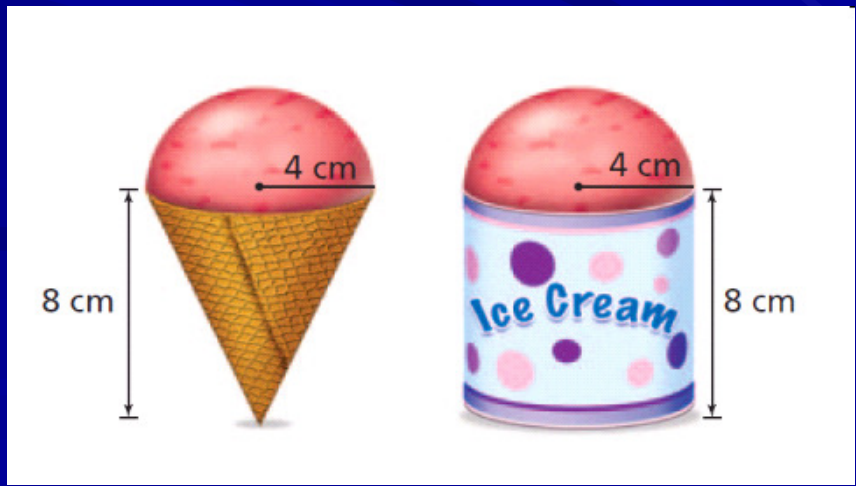
Directions for Making Paper Cylinders

- Start with two identical sheets of paper.
- Use the longer dimension of one sheet of paper as the height of the first cylinder. Tape the paper into the shape of a cylinder.
- Use the shorter dimension of the other sheet of paper as the height of the second cylinder. Tape the paper into the shape of a cylinder.

How do the volumes of the two cylinders compare?

What are we using in the classroom… and at home? (Geometry)

- Grade 7:
  - Derivation of the relationship between the circumference, area and diameter of a circle.
- Grade 8:
  - Volumes of cylinders, cones and spheres



How has Math Instruction Changed…

Not all standards are created equal

- In Class…
  - Student will spend time practicing problems on the same topic
- At Home…
  - Parents can encourage children to memorize their basic facts

Not all standards are created equal…

- **Supporting clusters**
  - Geometry… starts to become more prevalent in the middle grades
- **Additional Clusters**
  - Statistics and Probability…
    - Grade 8: C*ollect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?*

How has Math Instruction Changed…

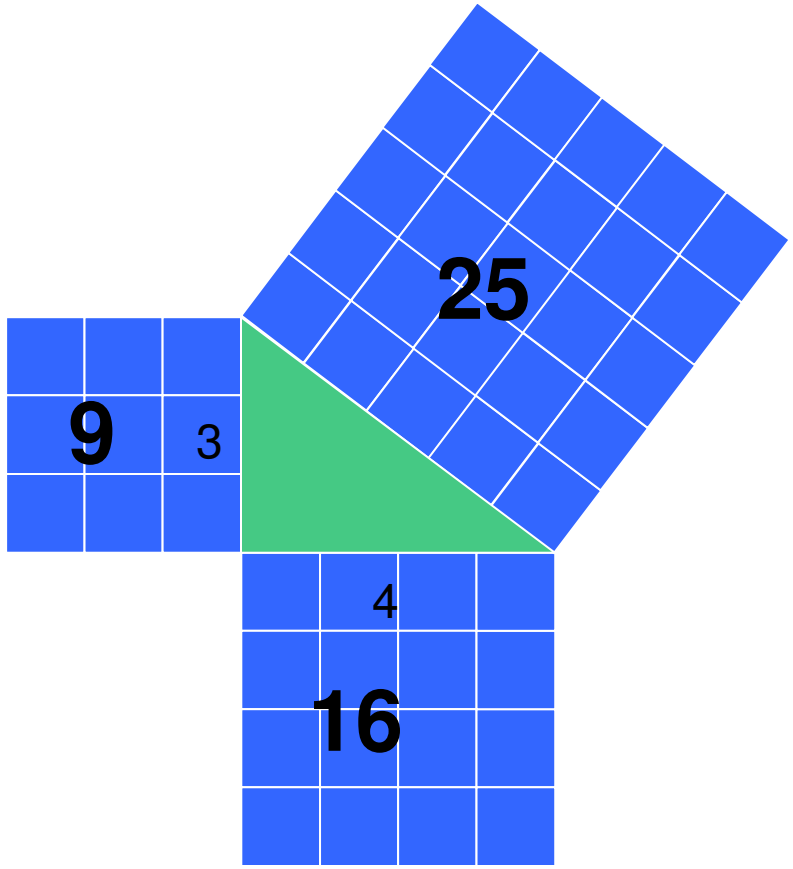
We want our children to appreciate math

- In Class…
  - Student will talk about math and prove why and how math works
- At Home…
  - Parents can be open to different strategies

We want our children to appreciate math

- The Pythagorean Theorem is…

$$a^2 + b^2 = c^2$$



How has Math Instruction Changed…

Math is all around us…

- In Class…
  - Student will know and apply the correct math in real world situations.
- At Home…
  - Parents can ask children to do the math that comes up in your daily life.

Math is all around us…

- **Grade 6:**
  - At the grocery store…
    - Ask your child to calculate the unit rates of items purchased from the grocery store. For example, if 2 pounds of flour cost $3.00, how much does flour cost per pound?
  - In the Kitchen...
    - Have your child determine the amount of ingredients needed when cooking. For example, if a recipe calls for 8 cups of rice to serve 4 people, how many cups of rice do you need to serve 6 people?
  - While doing work around the house…
    - Have your child find the surface area of the walls and ceiling of a room to determine the cost of painting the room.

Math is all around us…

- **Grade 7:**
  - At the mall…
    - Use store advertisements to engage your child in working with numbers. For example, if a store advertises 30% off, have your child estimate the dollar amount of the discount, as well as the sale price of an item.
  - In a Restaurant...
    - Much of the math we use everyday is not exact. We estimate how much money we need for an evening out. For example, estimate the bill… before it arrives. How much is the tax? How much should we leave for a tip?
  - At the checkout counter…
    - Use our experiences to begin a discussion about math. For example, when leaving the supermarket, which line do you get in… 4 people with 2, 4, 3 and 5 items, or the line with one person with 19 items?

Math is all around us…

- **Grade 8:**
  - In the Newspaper…
    - Discuss studies that connect two variables. For example, can the height of someone predict how high they can jump?
  - On the Road...
    - Talk to your child about rates of speed. For example, Grandma's house is 160 miles away. What was our average rate of speed if we arrived in 2 hours and 45 minutes? What variable will affect our rate of speed?
  - At Graduation…
    - Mathematical reasoning appears in many forms. A recent tweet: "OMG… 40 names in 8 minutes! I'm going to be sitting here for another 58 minutes!"

What else can we do at home?

- **Be Positive!**
  - Avoid statements like "*I wasn't good at math*" or "*Math is too hard*."
- **Play Games!**
  - *Board Games help children develop number sense, foundation of probability and are fun!*
- **Use Math Vocabulary**
- **Ask Why?**
  - *How did you figure it out?*

Resources

- www.engageny.org
  - New York's Common cores website
- http://learnzillion.com/
  - Great videos that explain common core concepts
- http://www.azed.gov/azcommoncore
  - Detailed explanation of each standard
- www.commoncoreconversation.com
  - "One stop shopping for the common core"