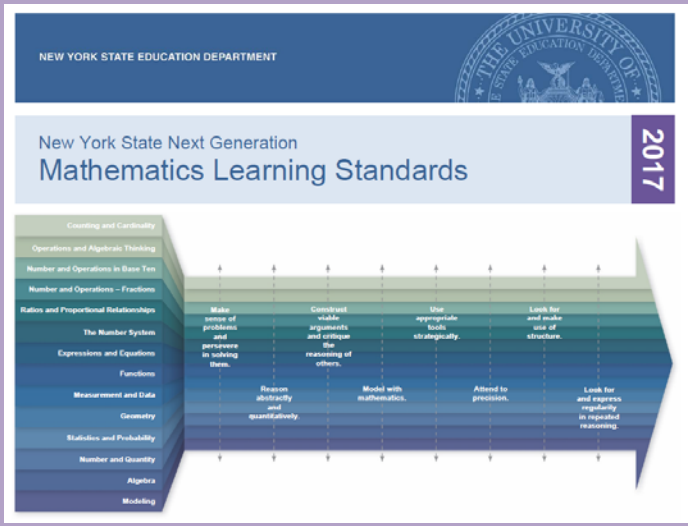
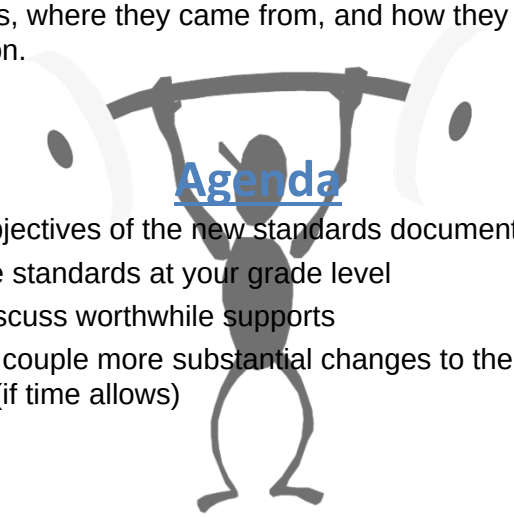
Utilizing the New Teacher-Support Features in the…



Brian Cohen bcohen@skanschools.org

Goal

Gain more insight into the types of support features built into the new standards, where they came from, and how they support implementation.



Agenda

1. Vision & objectives of the new standards document
2. Dig into the standards at your grade level
3. Share & discuss worthwhile supports
4. Highlight a couple more substantial changes to the *content* of the standards (if time allows)

CCSS → NYS NGMS

In 2012, at UC Berkeley, Bill McCallum talks about the worthwhile residue left behind when the CCSS-M collapses. He offers, for example, that well developed research-based curricula may endure and benefit students long after the CCSS-M.

As NYS moves forward from the CCSS, we wanted to:

- Keep some the good parts.
- Leave behind what didn't work for us.
- Make improvements and upgrades wherever possible.

Standards Document - Current

Counting & Cardinality **K.CC**

Know number names and the count sequence.

1. Count to 100 by ones and by tens.
2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).

Count to tell the number of objects.

4. Understand the relationship between numbers and quantities; connect counting to cardinality.
   a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
   b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
   c. Understand that each successive number name refers to a quantity that is one larger.
   d. *Develop understanding of ordinal numbers (first through tenth) to describe the relative position and magnitude of whole numbers.*
5. Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.

Compare numbers.

6. Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.[1]
7. Compare two numbers between 1 and 10 presented as written numerals.

[1] Include groups with up to ten objects.

Standards Document - Current

PARCC MODEL CONTENT FRAMEWORKS

MATHEMATICS

GRADES 3–11

Version 4.0

December 2014

PARCC MODEL CONTENT FRAMEWORKS

A COMPANION TO THE COMMON CORE STATE STANDARDS

MATHEMATICS:

KINDERGARTEN THROUGH GRADE 2

September 2014

Standards Document - Current

Examples of Key Advances from Kindergarten to Grade 1

- Students gradually come to employ mental strategies (such as counting on and making ten) that make use of embedded concepts of number and the properties of addition and subtraction; by contrast, kindergarten students determine sums and differences primarily by representing problems with objects or drawings.

Fluency Expectations or Examples of Culminating Standards

1.OA.C.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).

Examples of Major Within-Grade Dependencies

- 1.NBT.B.2 describes the place-value foundations for 1.NBT.B.3 and 1.NBT.C.4. Comparing numbers (1.NBT.B.3) involves thinking about the sizes of tens and ones, and adding two-digit numbers (1.NBT.C.4) involves adding tens with tens and ones with ones, and sometimes composing a ten. These ideas and methods rest on an understanding of the place-value units and the use of visual models of these units in solving and explaining problems using these standards.

Standards Document - Current

The importance of specifying the whole

Without specifying the whole it is not reasonable to ask what fraction is represented by the shaded area. If the left square is the whole, the shaded entire rectangle is the

ore

draft)

The word *fluent* is used in the Standards to mean "fast and accurate." Fluency in each grade involves a mixture of just knowing some answers, knowing some answers from patterns (e.g., "adding 0 yields the same number"), and knowing some answers from the use of strategies. It is important to push sensitively and encouragingly toward fluency of the designated numbers at each grade level, recognizing that fluency will be a mixture of these kinds of thinking which may differ across students. The extensive work relating addition and subtraction means that subtraction can frequently be solved by thinking of the related addition, especially for smaller numbers. It is also important that these patterns, strategies and decomposi-

Draft, 5|29|2011, comment at `commoncoretools.wordpress.com`.

Standards Document - Current

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[1] Include groups with up to ten objects.

Standards Document – A better way!

NY-2.OA Operations and Algebraic Thinking

Standards Document – A better way!

NY-2.OA Operations and Algebraic Thinking

Add and subtract within 20.

2a. Fluently add and subtract within 20 using mental strategies. Strategies could include:

Coherence: NY-1.OA.6 → NY-2.OA.2

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Standards Document – A better way!

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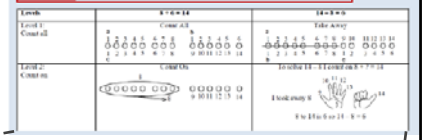
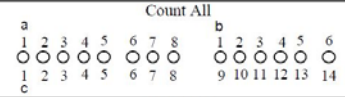
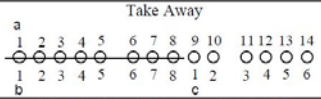
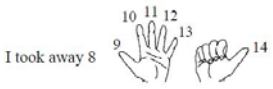


Levels	8 + 6 = 14	14 – 8 = 6
Level 1: Count all	Count All 	Take Away 
Level 2: Count on	Count On 	To solve 14 – 8 I count on 8 + ? = 14  I took away 8 8 to 14 is 6 so 14 – 8 = 6

Standards Document – A better way!

NY-2.OA Operations and Algebraic Thinking

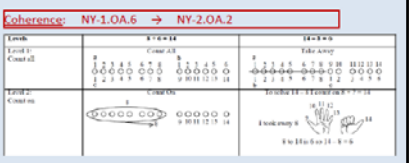
Add and subtract within 20.

2a. Fluently add and subtract within 20 using mental strategies. Strategies could include:

- counting on;
- making ten;
- decomposing a number leading to a ten;
- using the relationship between addition and subtraction; and
- creating equivalent but easier or known sums.

2b. Know from memory all sums within 20 of two one-digit numbers.

Coherence: NY-1.OA.6 → NY-2.OA.2



e.g., 8 + 6 =
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Standards Document – A better way!

Note on *Fluency* with Facts:

- *Fluently* adding and subtracting within 20 (NY-2.OA.2) means students can find sums and differences within 20 reasonably quickly, and say or write it. Fluency involves a mixture of just knowing some answers, knowing some answers from patterns, and knowing some answers from the use of strategies.[10] Reaching fluency will take much of the year for many students. For more on how children develop fluency, see *K–5 Progression on Counting and Cardinality and Operations and Algebraic Thinking*, pp. 18-19 and *Adding it Up*, pp. 182-195.

Note on *Fluency* vs. *Knowing from Memory*:

- The standards intentionally distinguish between asking for *fluency* with addition and subtraction (NY-2.OA.2a) and asking students to *know from memory* addition facts (NY-2.OA.2b). *Fluency* means students are fast, accurate, flexible, and have understanding. They use strategies efficiently.[12] By the end of the K–2 grade span, students have sufficient experience with these strategies to *know from memory* all single-digit sums.[10]

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Standards Document – A better way!

NY-2.OA — Operations and Algebraic Thinking

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e.g., 8 + 6 =
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Linked Navigation: Intro, MP, PK, K, 1, 2, 3, 4, 5, 6, 7, 8, HS Intro, Algebra I, Geometry, Algebra II, Plus, Citations

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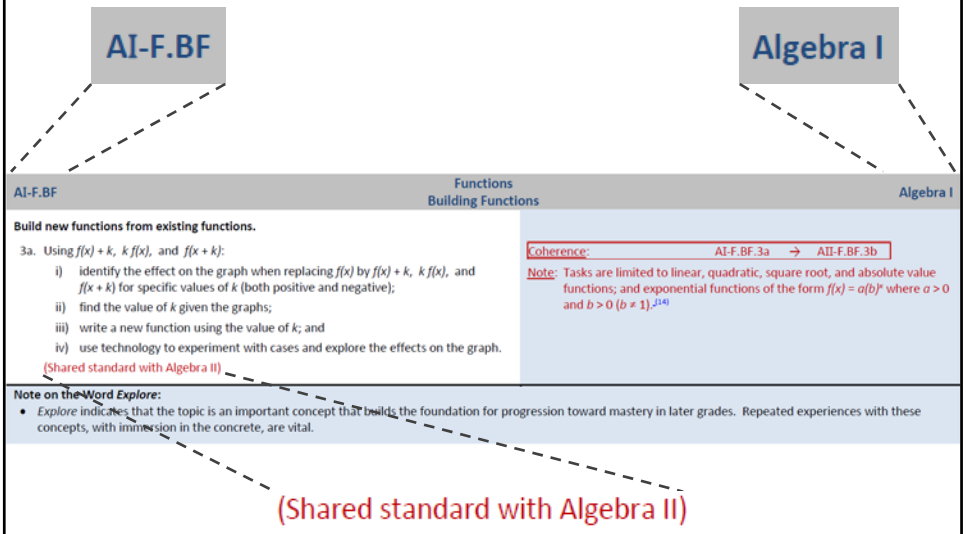
Standards Document – A better way!



Standards Document – A better way!

- Standards tagging is distinct from, but connected to CCSS
- Embed support at point-of-use:
  - "Coherence Links" to show the vertical coherence of the standards and help teachers differentiate (especially for students with IEPs and ELLs).
  - Notes and illustrations to clarify individual standards, answer FAQs, or otherwise support implementation
  - "Within-Grade Connections" to show horizontal coherence
  - Notes highlighting connections between the Standards for Mathematical Practice and content standards
  - footnotes from the original standards
- Linked navigation
- HS standards organized by course (not by Conceptual Category) and tagged to make the course clear
- *Algebra I* and *Algebra II* shared standards clearly marked

Treasure Hunt

	-1	Your Grade Level	+1
Fluency with Procedures 2 - A2			
Illustration merged from CCSS appendix PK - 5			
Illustration merged from outside source or new K - 4			
Spacing/alignment PK - A2			
Within-Grade Connection PK - (+)			
Connecting MPs PK - A2			
Note on left PK - 8: footnote from CCSS A1 & A2: shared standard			
Coherence Links PK - (+)			
e.g. PK - (+)			
Note on right (citation) PK - (+)			

Treasure Hunt

Share & Discuss

	-1	Your Grade Level	+1
Fluency with Procedures 2 - A2			
Illustration merged from CCSS appendix PK - 5			
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Within-Grade Connection PK - (+)			
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Note on left PK - 8: footnote from CCSS A1 & A2: shared standard			
Coherence Links PK - (+)			
e.g. PK - (+)			
Note on right (citation) PK - (+)			

Standards Themselves – Current

PK.OA.2	Kndg.
Duplicate and extend (e.g., What comes next?) simple patterns using concrete objects.	None

Standards Themselves – Better coherence!

PK.OA.2	NY-K.OA.6
Duplicate and extend (e.g., What comes next?) simple patterns using concrete objects.	Duplicate, extend, and create simple patterns using concrete objects.

Standards Themselves – Better clarity!

4.MD.1
Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...*

p. 64

Standards Themselves – Better clarity!

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p. 64

NY-4.MD **Measurement and Data**

Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

1. Know relative sizes of measurement units: ft., in.; km, m, cm

Know the conversion factor and use it to convert measurements in a larger unit in terms of a smaller unit: ft., in.; km, m, cm; hr., min., sec.

Given the conversion factor, convert all other measurements within a single system of measurement from a larger unit to a smaller unit.

Record measurement equivalents in a two-column table.

Standards Themselves – Better clarity!

3.OA.8
Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.[3]

[3]This standard is limited to problems posed with whole numbers and having whole number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order (Order of Operations).

p. 48

5.OA.1
Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

p. 68

Standards Themselves – Better clarity!

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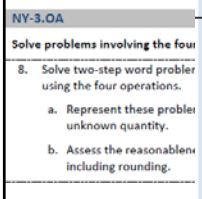
p. 48


NY-3.OA

Solve problems involving the fou

8. Solve two-step word problem using the four operations.

a. Represent these proble unknown quantity.

b. Assess the reasonablen including rounding.

Coherence: NY-2.OA.1 → NY-3.OA.8 → NY-4.OA.3

Note: Two-step problems need not be represented by a single expression or equation.

Standards Themselves – Better clarity!

5.OA.1
Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

p. 68

NY-5.OA

Write and interpret numerical expr

1. Apply the order of operations

Coherence: NY-5.OA.1 → NY-6.EE.2

e.g.,

- 6 + 8 ÷ 2
- (6 + 8) ÷ 2

Note: Exponents and nested grouping symbols are not included.

Standards Themselves – Current

2.G.1
Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.[5] Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

3.G.1
Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

4.G.1
Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

4.G.2
Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.

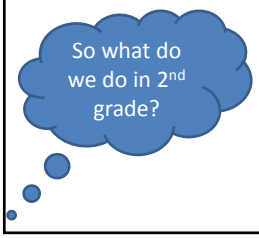
5.G.3
Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. *For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.*

5.G.4
Classify two-dimensional figures in a hierarchy based on properties.

Standards Themselves – Better coherence!

2.G.1
Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.[5] Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

NY-3.G.1
Recognize and classify polygons based on the number of sides and vertices (triangles, quadrilaterals, pentagons, and hexagons). Identify shapes that do not belong to one of the given subcategories.



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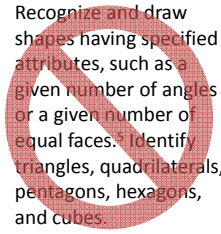

NY-2.G.1
Classify two-dimensional figures as polygons or non-polygons.

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Standards Themselves – Better coherence!

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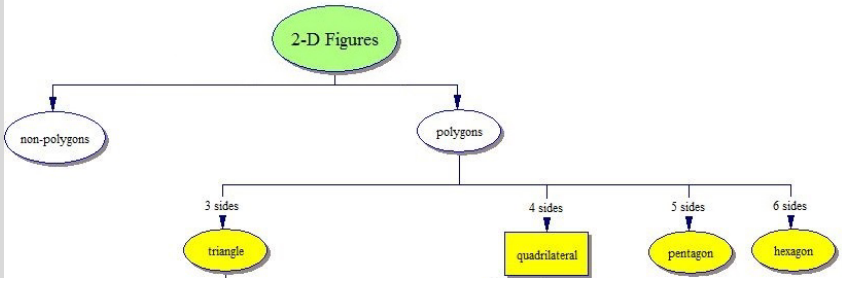

Standards Themselves – Better coherence!

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5.G.3
Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. *For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.*

5.G.4
Classify two-dimensional figures in a hierarchy based on properties.

Standards Themselves – Better coherence!

NY-2.G.1
Classify two-dimensional figures as polygons or non-polygons.

NY-3.G.1
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NY-5.G.3
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NY-5.G.4
Classify two-dimensional figures in a hierarchy based on properties.

Standards Themselves – Better coherence!

NY-2.G.1
Classify two-dimensional figures as polygons or non-polygons.

NY-3.G.1
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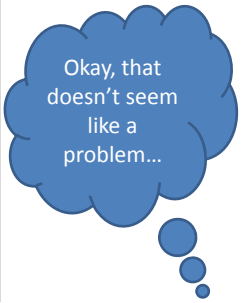
4.G.1
Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.



NY-5.G.3
Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. *For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.*

NY-5.G.4
Classify two-dimensional figures in a hierarchy based on properties.

Standards Themselves – Better coherence!

NY-2.G.1
Classify two-dimensional figures as polygons or non-polygons.

NY-3.G.1
Recognize and classify polygons based on the number of sides and vertices (triangles, quadrilaterals, pentagons, and hexagons). Identify shapes that do not belong to one of the given subcategories.

NY-4.G.1
Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

But I'm not sure it really scaffolds 3.G.1 to 5.G.3 very well. What was 4.G.2 again?

NY-5.G.3
Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. *For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.*

NY-5.G.4
Classify two-dimensional figures in a hierarchy based on properties.

Standards Themselves – Better coherence!

NY-2.G.1
Clas
dir

But the only 2 D shapes we classify based on the presence of parallel sides are quads… so why doesn't it just say classify quads?

gons). Identify
shapes that do
belong to one of the
given subcategories.

NY-4.G.1
Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

4.G.2
Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.

NY-5.G.3
Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. *For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.*

NY-5.G.4
Classify two-dimensional figures in a hierarchy based on properties.

Standards Themselves – Better coherence!

NY-2.G.1
Clas
dir

But the only 2 D shapes we classify based on the presence of parallel sides are quads… so why doesn't it just say classify quads?

gons). Identify

Oh! Because the part that talks about angles apply to triangles, too.

Wait. So, some of this applies only to quads and some applies to quads and triangles? This is confusing.

Yes. And you re right it is confusing!

NY-4.G.1
Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

4.G.2
Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.

NY-5.G.3
Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. *For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.*

NY-5.G.4
Classify two-dimensional figures in a hierarchy based on properties.

Standards Themselves – Better coherence!

NY-2.G.1
Classify two-dimensional figures as polygons or non-polygons.

NY-3.G.1
Recognize and classify polygons based on the number of sides and vertices (triangles, quadrilaterals, pentagons, and hexagons). Identify shapes that do not belong to one of the given subcategories.

And worst of all, it seems really murky where the boundary between this standard and 5.G.3 is.

NY-4.G.1
Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

4.G.2
Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.

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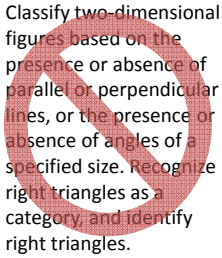

NY-4.G.2
Identify and name triangles based on angle size (right, obtuse, acute).

Identify and name all quadrilaterals with two pairs of parallel sides as parallelograms.

Identify and name all quadrilaterals with four right angles as rectangles.

Standards Themselves – Better coherence!

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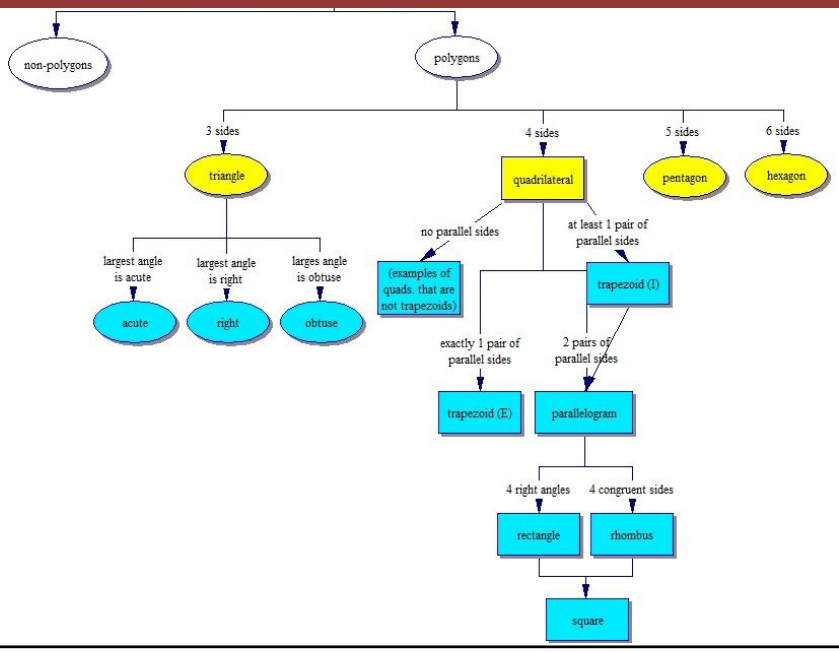
Standards Themselves – Better coherence!



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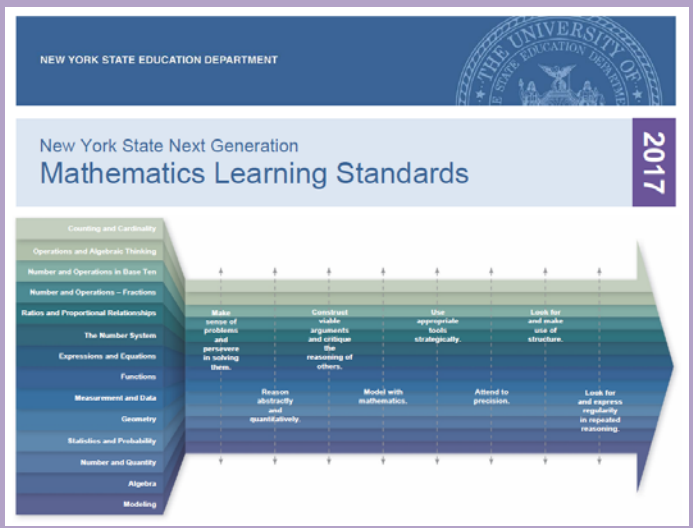

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