Priorities in the Common Core State Standards’ Standards for Mathematical Content

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DISCUSSION DRAFT

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Introduction

The next three years are a critical period of transition. Now that the Standards have been adopted by a number of states, the field has begun to respond. States and districts are working toward implementation. The two Race to the Top assessment consortia are designing assessment systems for 2014–15. Commercial providers of curriculum, professional development, and assessments are creating tools for states, districts, and teachers to use. Three years from now, we can be well along the way to making the vision of the Standards for greater focus and coherence in mathematics a reality. But translating Standards into quality curriculum, assessment, and instruction is difficult. In the case of the Common Core Standards, it might be more difficult still, because these are challenging standards with higher expectations for conceptual understanding, procedural skill, and problem solving.

It is important then to recognize that the Standards are designed to be a strategy for meeting the very challenge they set. The Standards focus on crucial material, so students can have more time to discuss, reflect upon, and practice it. The Standards treat mathematics as a coherent subject, in order to promote the sense-making that fuels achievement. The principles of focus and coherence are the twin engines that must be carried forward in implementation efforts, and instantiated in curricula and assessments.

Another challenge is that the next three years will be defined by scarcity—scarcity of funds for professional development and new curriculum materials, scarcity of testing time, and scarcity of instructional days. In a world without scarcity, everything can be done equally well and there is never a need to set priorities. That is not our world. And while mathematics education is about more than mathematical content, everything in mathematics education ultimately happens through mathematical content. Therefore we will need to prioritize within that content.

Not everything in the Standards should have equal priority. For one thing, CCSSO and NGA charged the Working Group with basing the Standards on evidence. And in fact, the actual demands of college and careers elevate some material in the Standards to high importance for mastery, while making other material less important.

Moreover, at every level in mathematics there are intricate, challenging, and necessary things that serve as prerequisites for the next level’s intricate, challenging, and necessary things. In
In order to keep as many students as possible on the path to readiness for college and careers, we need to give students enough time to succeed in these areas.

More is at stake than the mastery of specific content that bears causally on a student’s future chances. There is also the building of those capacities contributing to college success which cannot be captured by content standards alone. A classroom scrambling to cover everything is an environment hostile to any number of educational goals, whether those be Conley’s intellectual openness, the William & Flora Hewlett Foundation’s self-directed learning, or even the Standards for Mathematical Practice themselves.

For all these reasons, we here suggest a prioritization of content in the Standards for purposes of focusing time, effort, and investment in bringing more students to college readiness.

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I. General considerations

The following are not *reasons* to focus; rather, they are things to keep in mind for doing it well.

- Signals about priority should be qualitative, yet clear and firm. Where quantitative description is necessary, rough numbers are enough to communicate intent. A clanking system of weights and measures might tend to suggest greater precision than is either possible or desirable.

- Setting priorities can seem to turn the content landscape into a field of competition, with “topic winners” and “topic losers.” But the responsibility of educators is to students, not to topics. Topics don’t have feelings and can’t experience pain. And ultimately, the point of having priorities in life and work altogether is precisely to admit that some things do and should come at the expense of others when necessary. (If not necessary, then so much the better.)

- Focus does not imply exclusion. Nothing from a consensus policy document can be zeroed out completely, even if its necessity as a prerequisite for college readiness is demonstrably zero.¹

- Focus doesn’t mean ensuring that one thing gets a larger share of time and resources than any other single thing. That is a “shopping-aisle” mentality, in which we go up and down the aisles throwing things into the basket—pretty soon, without our noticing, healthy food is in the overall minority. Instead, focus has to mean ensuring that the top tier gets a larger share of time and resources than everything else combined, while remaining meaningfully limited in scope.

- The Standards are built out of progressions, so priorities have to be chosen with an eye to the arc of big ideas in the Standards. A prioritization scheme that respects progressions in the Standards will strike a balance between the journey and the endpoint. If the endpoint is everything, few will have enough wisdom to walk the path; if the endpoint is nothing, there is likely nothing or almost nothing in the K–8 Standards that fits this description. As noted previously however, that does not imply that everything in the K–8 standards must be taught with the same intensity, or learned to the same depth of mastery, or that everything has the same consequences for students if, despite everyone’s best efforts, it is not learned. Nor does it imply, at least logically speaking, that everything in the K–8 standards must be learned while students are in grades K–8. Nor does it imply that everything must be learned in the mathematics classroom, nor, I suppose, in the classroom at all.

¹ There is likely nothing or almost nothing in the K–8 Standards that fits this description. As noted previously however, that does not imply that everything in the K–8 standards must be taught with the same intensity, or learned to the same depth of mastery, or that everything has the same consequences for students if, despite everyone’s best efforts, it is not learned. Nor does it imply, at least logically speaking, that everything in the K–8 standards must be learned while students are in grades K–8. Nor does it imply that everything must be learned in the mathematics classroom, nor, I suppose, in the classroom at all.
few will understand where the journey is headed. Beginnings and endings both need particular care—beginnings inasmuch as the ends depend upon them entirely, and endings inasmuch as the journey itself was designed to lead to those ends. For example, standard 2.OA.2 is the culmination of a major three-year body of work. It would be a mistake not to identify such a standard as a locus of emphasis. It would also be a mistake to dis incent people from the investments in prior work that aim to make meeting this standard possible in the first place.

- It is possible to work at too high a grain size, and thereby fail to send meaningful signals about priority. However, it is also possible to work at too fine a granularity and thereby force bizarre conversations about how to spend time. (“Should we spend 2 days for this standard, or 3 days? It’s lower priority than this one, and I only did 3 days for that one.”) Moreover, if the prioritization lens has too small a field of view, then the coherence value of closely related standards will be sacrificed.

- Just as not all topics are equal, not all connections between topics are equal. Standards in the focus set don’t automatically pull in everything that might be seen as connected with them. It might even be helpful for some connections to cross in and out of the focus set, so that this material can be addressed in a way that promotes focus instead of detracting from it. Coherence would then become an engine for focus, even as focus is meant to be an engine for coherence.

**Implications.** Given the design of the content standards—and given what its particular statements actually say—the best way to balance forces is to work primarily at the cluster level. Thus, in the next section we identify each cluster in the Standards as belonging to one of three qualitative levels. The names chosen for these levels are important, because the terms are meant to apply in many contexts and influence resource allocations across the board, from testing time, to curriculum page counts, to professional development, to R&D budgets, to general attitudes. We here use the following names:

- Focus
- Additional
- Sample
These tiers would have applications in various contexts. For example,

- In a testing context, there could be a rough 70-20-10 breakdown in testing time across the three tiers. This is not unduly narrow—the Focus tier is a wide swath of content by itself. Indeed, in cases where there is very little material in the Sample tier, the Sample tier would be easily less than 10%. In the rough 70-20-10 picture, 70 is a lower bound while 10 is an upper bound.

- In an instructional context, the implications of these terms might be fairly loose. A teacher might see “Focus” and respond by being more than usually thorough, whether in planning instruction or in making sure that all the students really get the ideas before moving on.

- In a commercial context, product developers might budget more of their time and energy for innovating within the Focus set. Purchasers in states, districts, and schools could send signals to the market by paying special attention to how well materials and services address content in the Focus set—and whether those materials and services indeed focus appropriately on it. Imagine a marketplace in which shallow coverage were a liability, not a selling point.

**Rethinking and linking.** The three tiers are mutually exclusive in the sense that each cluster belongs to one and only one tier. But in practice, the tiers can work together to support the priorities of the grade. For example, teachers can view “Additional” and “Sample” in relation to the Focus tier by pulling the lower-priority material into a lesson that is centrally about more important things; e.g., pictographs in Grade 3 could be positioned in direct support of multiplication and two-step word problems. Because the Additional and Sample tiers often include engaging material, they can be an attraction to higher priority work, rather than a distraction from it.

**Advanced work in high school.** Advanced work in high school is often found in the Additional or Sample tier. Students who intend to pursue STEM careers, or take Advanced Placement courses during high school, should master most of this material.
II. Priorities in the Standards for Mathematical Content

On the following pages, we indicate cluster-level priorities by annotating overview pages for the grades and high school conceptual categories in the Common Core State Standards for Mathematics. The key for these annotations is

- **Focus**
- **Additional**
- **Sample**

Because there are no specific content clusters for Modeling, we have not shown an overview page for that category. However, many cluster-level priorities were chosen with Modeling in view.

The overview pages that follow also indicate certain individual standards as opportunities for especially in-depth treatment. This aspect of the priorities is discussed further following the annotated overview pages themselves.
Grade K Overview

Counting and Cardinality
- Know number names and the count sequence.
- Count to tell the number of objects.
- Compare numbers.

Operations and Algebraic Thinking
- Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.

Number and Operations in Base Ten
- Work with numbers 11–19 to gain foundations for place value.

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

Measurement and Data
- Describe and compare measurable attributes.
- Classify objects and count the number of objects in categories.

Geometry
- Identify and describe shapes.
- Analyze, compare, create, and compose shapes.

DOs: CC 4, 5, 6; OA 2, 4
Grade 1 Overview

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

- Extend 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.

DOs: OA 1, 6; NBT 2, 4; MD 2

Mathematical Practices

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

Operations and Algebraic Thinking
- Represent and solve problems involving addition and subtraction.
- Add and subtract within 20.
- Work with equal groups of objects to gain foundations for multiplication.

Number and Operations in Base Ten
- Understand place value.
- Use place value understanding and properties of operations to add and subtract.

Measurement and Data
- Measure and estimate lengths in standard units.
- Relate addition and subtraction to length.
  - Work with time and money.
  - Represent and interpret data.

Geometry
- Reason with shapes and their attributes.

DOs: OA 1, 2; NBT 1, 7; MD 5

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

Operations and Algebraic Thinking

- Represent and solve problems involving multiplication and division.
- Understand properties of multiplication and the relationship between multiplication and division.
- Multiply and divide within 100.
- Solve problems involving the four operations, and identify and explain patterns in arithmetic.

Number and Operations in Base Ten

- Use place value understanding and properties of operations to perform multi-digit arithmetic.

Number and Operations—Fractions

- Develop understanding of fractions as numbers.

Measurement and Data

- Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.
- Represent and interpret data.
- Geometric measurement: understand concepts of area and relate area to multiplication and to addition.
- Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

Geometry

- Reason with shapes and their attributes.

Mathematical Practices

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

DOs: OA 3, 7; NF 3; MD 2, 7
Grade 4 Overview

Operations and Algebraic Thinking
- Use the four operations with whole numbers to solve problems.
- Gain familiarity with factors and multiples.
- Generate and analyze patterns.

Number and Operations in Base Ten
- Generalize place value understanding for multi-digit whole numbers.
- Use place value understanding and properties of operations to perform multi-digit arithmetic.

Number and Operations—Fractions
- Extend understanding of fraction equivalence and ordering.
- Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
- Understand decimal notation for fractions, and compare decimal fractions.

Measurement and Data
- Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
- Represent and interpret data.
- Geometric measurement: understand concepts of angle and measure angles.

Geometry
- Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

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

DOs: NBT 5, 6; NF 1, 3, 4
Grade 5 Overview

Operations and Algebraic Thinking
- Write and interpret numerical expressions.
- Analyze patterns and relationships.

Number and Operations in Base Ten
- Understand the place value system.
- Perform operations with multi-digit whole numbers and with decimals to hundredths.

Number and Operations—Fractions
- Use equivalent fractions as a strategy to add and subtract fractions.
- Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

Measurement and Data
- Convert like measurement units within a given measurement system.
- Represent and interpret data.
- Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

Geometry
- Graph points on the coordinate plane to solve real-world and mathematical problems.
- Classify two-dimensional figures into categories based on their properties.

DOs: NBT 1, 6; NF 2, 4; MD 5

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

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.
- Compute fluently with multi-digit numbers and find common factors and multiples.
- Apply and extend previous understandings of numbers to the system of rational numbers.

Expressions and Equations

- Apply and extend previous understandings of arithmetic to algebraic expressions.
- Reason about and solve one-variable equations and inequalities.
- Represent and analyze quantitative relationships between dependent and independent variables.

Geometry

- Solve real-world and mathematical problems involving area, surface area, and volume.

Statistics and Probability

- Develop understanding of statistical variability.
- Summarize and describe distributions.

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
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DOs: RP 3; NS 1, 8; EE 3, 7
Grade 7 Overview

Ratios and Proportional Relationships
- Analyze proportional relationships and use them to solve real-world and mathematical problems.

The Number System
- Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

Expressions and Equations
- Use properties of operations to generate equivalent expressions.
- Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

Geometry
- Draw, construct, and describe geometrical figures and describe the relationships between them.
- Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

Statistics and Probability
- Use random sampling to draw inferences about a population.
- Draw informal comparative inferences about two populations.
- Investigate chance processes and develop, use, and evaluate probability models.

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

DOs: RP 2; NS 3; EE 3, 4; G 6
Grade 8 Overview

The Number System

- Know that there are numbers that are not rational, and approximate them by rational numbers.

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.
- Use functions to model relationships between quantities.

Geometry

- Understand congruence and similarity using physical models, transparencies, or geometry software.
- Understand and apply the Pythagorean Theorem.
- Solve real-world and mathematical problems involving volume of cylinders, cones and spheres.

Statistics and Probability

- Investigate patterns of association in bivariate data.

Mathematical Practices

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

DOs: EE 5, 7, 8; F 2; G 7
Number and Quantity Overview

The Real Number System

- Extend the properties of exponents to rational exponents
- Use properties of rational and irrational numbers.

Quantities

- Reason quantitatively and use units to solve problems

The Complex Number System

- Perform arithmetic operations with complex numbers
- Represent complex numbers and their operations on the complex plane
- Use complex numbers in polynomial identities and equations

Vector and Matrix Quantities

- Represent and model with vector quantities.
- Perform operations on vectors.
- Perform operations on matrices and use matrices in applications.

DOs: N-NQ 1

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
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Algebra Overview

Seeing Structure in Expressions
- Interpret the structure of expressions
- Write expressions in equivalent forms to solve problems

Arithmetic with Polynomials and Rational Expressions
- Perform arithmetic operations on polynomials
- Understand the relationship between zeros and factors of polynomials
  - Use polynomial identities to solve problems
  - Rewrite rational expressions

Creating Equations
- Create equations that describe numbers or relationships

Reasoning with Equations and Inequalities
- Understand solving equations as a process of reasoning and explain the reasoning
- Solve equations and inequalities in one variable
- Solve systems of equations
- Represent and solve equations and inequalities graphically

Mathematical Practices
- 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.

DOs: A–SSE 2, 3; A–APR 1; A–CED 2; A–REI 4
Functions Overview

Interpreting Functions

☐ Understand the concept of a function and use function notation
☐ Interpret functions that arise in applications in terms of the context
☐ Analyze functions using different representations

Building Functions

☐ Build a function that models a relationship between two quantities
☐ Build new functions from existing functions

Linear, Quadratic, and Exponential Models

☐ Construct and compare linear, quadratic, and exponential models and solve problems
☐ Interpret expressions for functions in terms of the situation they model

Trigonometric Functions

☐ Extend the domain of trigonometric functions using the unit circle
☐ Model periodic phenomena with trigonometric functions
☐ Prove and apply trigonometric identities

Mathematical Practices

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DOs: F-IF 4, 8, 9; F-LE 1
**Geometry Overview**

**Congruence**
- Experiment with transformations in the plane
- Understand congruence in terms of rigid motions
- Prove geometric theorems
  - Make geometric constructions

**Similarity, Right Triangles, and Trigonometry**
- Understand similarity in terms of similarity transformations
- Prove theorems involving similarity
- Define trigonometric ratios and solve problems involving right triangles
  - Apply trigonometry to general triangles

**Circles**
- Understand and apply theorems about circles
- Find arc lengths and areas of sectors of circles

**Expressing Geometric Properties with Equations**
- Translate between the geometric description and the equation for a conic section
- Use coordinates to prove simple geometric theorems algebraically

**Geometric Measurement and Dimension**
- Explain volume formulas and use them to solve problems
- Visualize relationships between two-dimensional and three-dimensional objects

**Modeling with Geometry**
- Apply geometric concepts in modeling situations

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**Mathematical Practices**
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3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.
Statistics and Probability Overview

Interpreting Categorical and Quantitative Data

- Summarize, represent, and interpret data on a single count or measurement variable
- Summarize, represent, and interpret data on two categorical and quantitative variables
- Interpret linear models

Making Inferences and Justifying Conclusions

- Understand and evaluate random processes underlying statistical experiments
- Make inferences and justify conclusions from sample surveys, experiments and observational studies

Conditional Probability and the Rules of Probability

- Understand independence and conditional probability and use them to interpret data
- Use the rules of probability to compute probabilities of compound events in a uniform probability model

Using Probability to Make Decisions

- Calculate expected values and use them to solve problems
- Use probability to evaluate outcomes of decisions

DOs: S-ID 3, 5, 6, 9; S-IC 3
III. Depth Opportunities

The overview pages in the previous section included not only cluster-level priorities, but also a designation of up to five standards per grade or major high school category from the Focus tier as opportunities for especially in-depth treatment. We call these standards DO’s—Depth Opportunities.

What is the intent of the DO’s? In a general sense, the DO’s provide qualitative information about how to allocate time and effort sensibly within the Focus tier, which is broad by itself.

More specifically, they supplement the cluster-level priorities by highlighting beginnings, endings, or critical moments in progressions. They also give the prioritization a way to handle the highly uneven grain size of the content standards; many of the DO’s are by no means small.

Like the cluster-level priorities, the DO’s are meant to have relevance for curriculum, instruction, assessment, and professional development, and for the public and private sectors. For example, a curriculum designer producing a textbook chapter—or a teacher planning a unit of instruction—might opt to “switch gears” for these areas, entering a more intense mode of engagement marked by tight focus, rigorous classroom reasoning and discussion, extended classroom time devoted to practice and reflection, and high expectations for mastery. Those reviewing or purchasing textbooks might pay particular attention to the quality of treatment in these areas.

Shared awareness of the DO’s among states and districts could also create greater market opportunities for excellence and innovation. Boutique content shops could create excellent supplementary materials in these areas, knowing that sales discussions would not automatically open with the question of coverage. Technology innovators could focus on DO’s to showcase new tools and demonstrate impact on learning without having to absorb the up-front cost of
exhaustive content development. DO’s give players like these an ecological niche in the content landscape and an opening to compete with larger companies.

The DO’s that were presented in the previous section were chosen with all of these intents in mind. There is a mixture of beginnings, endings, critical moments, and places where the Standards signal a different approach—all places where particular excellence is called for.

Efforts are underway to provide example tasks aligned to the Standards. It seems particularly important to provide a balanced set of excellent mathematical tasks aligned to the DO’s, as well as any immediate precursors or intimate neighbors. Such tasks could be used as models for summative assessments and also as classroom-level tools to inform instructional decisions. For high-stakes assessment in particular, it is important that tasks address the central concern of the standards being assessed, rather than pressing to the ends of the difficulty scale or exploring the exotic margins of the indicated scope of content.

The DO’s could have a role to play in improving today’s large-scale testing systems and their wide and shallow sampling. Sampling is logistically necessary, and it has game-theoretic value in defeating attempts to game the accountability system. But when sampling is the basic principle of test construction, the accountability system itself becomes a guessing game. It isn’t fair to teachers or students, and it’s contrary to the principles of focus and coherence in the Standards. These two principles make untenable the metaphor of math content as a homogeneous fluid, to be sampled by assessment experts and poured into little bottles. Perhaps in conjunction with a rough breakdown such as 70-20-10, there could be a qualitative constraint on test blueprints that the DO’s be represented in some fashion every year.

With at most five individual DO’s to work with, it is inevitable that different people would have made somewhat different choices. On the other hand, if the collection were large enough to approach uniqueness, then the resulting set would likely give a dangerous appearance of completeness. An idea might form in people’s minds that the 8, or 10, or 12 identified standards were somehow sufficient by themselves for instruction or assessment (which they would not be).

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2 This advice applies to all of the content standards, not just to those in the Focus tier.
The number five was chosen to be manifestly insufficient. Consequently, the standard of judging the DO’s is not whether they are inarguable, but whether they are reasonable and valuable. Settling on the DO’s is a little like settling on a national anthem. National anthems aren’t derivable from the criteria of their form—that they be stirring, that they be unifying—but they are constrained holistically by those criteria. The DO’s are like that, and like the Standards as a whole, which are also arguable, but reasonable and infused with salutary principles.
About the Author

Jason Zimba is co-founder of Student Achievement Partners, an organization that designs policy actions for raising student achievement. He served as a member of the writing team for the Common Core State Standards for Mathematics. His published research spans a range of fields including astronomy, astrophysics, theoretical physics, philosophy of science, and pure mathematics. His academic awards include a Rhodes scholarship and a Majorana Prize for theoretical physics. Jason has held faculty positions in physics and mathematics at Grinnell College and Bennington College. As an educator, he has taught physics, mathematics, and other subjects to college students, university physics and engineering majors, adult prison inmates, disadvantaged high school students, and children of non-English speaking immigrants. He is the author of *Force and Motion: An Illustrated Guide to Newton's Laws.*

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