Ensuring Equity and Access to Complex Tasks and Rigorous Learning

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Seattle, WA 98119

Outline of Day

Outline of Workshop

Part 1  Setting the Stage for Equity and Rigor by a Review of Content Complexity Schemes

Part 2  Depth-of-Knowledge Definitions, Practice, and Difficulty vs. Complexity

Part 3  DOK Applied to Instruction and Assessment considering Equity

Attainment vs. Readiness

Next Generation Assessments

21st Century Skills

College and Career Readiness
**Importance of Content Complexity**

- Vastness of Content
- Alignment
- Validity
- Clarity
- Teacher Guidance

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**What factors make educational material simple vs. complex?**

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**Description of Rigor**

- **Rigorous curriculum standards:** What every student needs to attain to be successful in higher education and the 21st century workplace.
- **Rigorous assessments:** Information and measures of the degree that students have attained the standards.
- **Rigorous accountability:** Level of proficiencies so that those who are judged as proficient are likely to be successful in higher education and careers.
GENERAL CHARACTERISTICS THAT WILL CONTRIBUTE TO RIGOR

The rigor of items will be increased by assessing more
- precise, greater depth, and higher level of cognitive complexity
- than one student expectation in an item

The rigor of the tests will be increased by
- assessing more focused student expectations but doing so multiple times and in more complex ways
- including a greater number of rigorous items on the test, thereby increasing the overall test complexity

March 2012

Attributes of a Rigorous Assessment Items

- Appropriate Content Complexity
- Precise
- Relevant
- Closely linked to a rigorous standard
- Real world content
- Others?

Ralph Tyler’s Behavioral Aspect of the Objectives (course dependent) (1949)

1. Understanding of important facts and principles
2. Familiarity with dependable sources of information
3. Ability to interpret data
4. Ability to apply principles
5. Ability to study and report results of study
6. Broad and mature interests
7. Social attitudes

Bloom’s Taxonomy (1956)

<table>
<thead>
<tr>
<th>Level</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Recall of specifics and generalizations; of methods and processes; and of pattern, structure, or setting.</td>
</tr>
<tr>
<td>Comprehension</td>
<td>Knows what is being communicated and can use the material or idea without necessarily relating it.</td>
</tr>
<tr>
<td>Application</td>
<td>Use of abstractions in particular and concrete situations.</td>
</tr>
<tr>
<td>Analysis</td>
<td>Make clear the relative hierarchy of ideas in a body of material or to make explicit the relations among the ideas or both.</td>
</tr>
<tr>
<td>Synthesis</td>
<td>Assemble parts into a whole.</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Judgments about the value of material and methods used for particular purposes.</td>
</tr>
</tbody>
</table>
Bloom’s Revised Taxonomy (2001)

<table>
<thead>
<tr>
<th>OLD</th>
<th>NEW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Remember</td>
</tr>
<tr>
<td>Comprehension</td>
<td>Understand</td>
</tr>
<tr>
<td>Application</td>
<td>Apply</td>
</tr>
<tr>
<td>Analysis</td>
<td>Analyze</td>
</tr>
<tr>
<td>Synthesis</td>
<td>Evaluate</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Create</td>
</tr>
</tbody>
</table>

Krathwohl and Anderson, 2001

Knowledge Dimension of Revised Bloom’s Taxonomy

- Factual knowledge
- Conceptual knowledge
- Procedural knowledge
- Metacognitive knowledge

Achieve’s Framework of Complexity Mathematics (2019)

https://www.achievethecore.org/cognitive-complexity-mathematics

Level 1: Procedure Complexity
- Little or below grade-level procedural demand.

Level 2: Conceptual Complexity
- Recall or recognize a grade-level concept without line of reasoning.

Level 3: Application Complexity
- Application of not immediately obvious mathematics, interpretation of the context, and deciding what to do.

(Krathwohl, 2002)
Achieve’s Framework of Complexity

**Reading** (2019)

https://www.achieve.org/cognitive-complexity-reading

<table>
<thead>
<tr>
<th>Level</th>
<th>Text Complexity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Explores a <strong>single theme</strong> common to readers (e.g.)</td>
</tr>
<tr>
<td>Medium</td>
<td>Explores several <strong>themes</strong> with varying levels of abstractions (e.g.)</td>
</tr>
<tr>
<td>High</td>
<td>Complex, sophisticated, or <strong>abstract themes</strong> or ideas (e.g.)</td>
</tr>
</tbody>
</table>

**Evidence**

<table>
<thead>
<tr>
<th>Evidence</th>
<th>Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Limited to a single section of text</td>
</tr>
<tr>
<td>2</td>
<td>In more than one non-contiguous or several contiguous sections</td>
</tr>
<tr>
<td>3</td>
<td>Span the entire text or multiple points in more than one text</td>
</tr>
</tbody>
</table>

Achieve’s Text Complexity Elements

---


<table>
<thead>
<tr>
<th>Recall</th>
<th>Demonstrate/Explain</th>
<th>Analyze/Investigate</th>
<th>Evaluate</th>
<th>Generate/Create</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide facts, terms, definitions, conventions; describe, etc.</td>
<td>Follow instructions; give examples; etc.</td>
<td>Categorize, schematize; distinguish fact from opinion; make inferences, draw conclusions; etc.</td>
<td>Determine relevance, coherence, logical, internal consistency; test conclusions; etc.</td>
<td>Integrate, dramatize; predict probable consequences; etc.</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Reproduction cluster</th>
<th>Knowledge of facts and common problem representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection cluster</td>
<td>Applying problem solving to non-routine situations in familiar contexts</td>
</tr>
<tr>
<td>Reflection cluster</td>
<td>Planning solution strategies and implementing them in problem settings with more elements and more unfamiliar contexts.</td>
</tr>
</tbody>
</table>
PISA: Three Science Competencies (2003)

- Identify scientific issues
- Explain phenomena scientifically
- Use scientific evidence

QUASAR Project: Cognitive Demand (1997)

- Memorization tasks
- Procedures without connections tasks
- Procedures with connection tasks
- Doing mathematics tasks

Strands of Mathematical Proficiency (Adding It Up, 2001)

- Conceptual understanding
- Procedural fluency
- Strategic competence
- Adaptive reasoning
- Productive disposition

Marzano’s Dimensions of Thinking (1988, p. 66) (WI DPI, 1989 adap.)

<table>
<thead>
<tr>
<th>Gathering Information</th>
<th>observe, recall, question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizing Information</td>
<td>represent, compare, classify, order</td>
</tr>
<tr>
<td>Analyzing Information</td>
<td>attributes and components, patterns and relationships, main points, accuracy and adequacy</td>
</tr>
<tr>
<td>Generating Information</td>
<td>infer, predict, elaborate</td>
</tr>
<tr>
<td>Integrating Information</td>
<td>summarize, restructure</td>
</tr>
<tr>
<td>Evaluating Information</td>
<td>establish criteria, verify</td>
</tr>
</tbody>
</table>
Why another system??

Standards-based education

Need for appropriate system to describe content complexity

Need for alignment

Depth of Knowledge (Webb, 1997)

Level 1: Recall
recall of a fact, information, or procedure, etc.

Level 2: Skills/Concepts
use information or conceptual knowledge, connecting ideas, etc.

Level 3: Strategic thinking
requires reasoning, developing a plan; may not have a single correct answer or approach, etc.

Level 4: Extended thinking
often an investigation or project; involves extended time spent on complex problems, etc.

Depth of Knowledge for Reading

Level 1: Recall of a fact, recognize text feature, verbatim recall, etc.

Level 2: Draw meaning from text using structure and features, comprehend, connect ideas, etc.

Level 3: Reason, conduct analysis to make inferences, read critically to attest to internal logic, implied values, identify abstract connections between texts, etc.

Level 4: Often an investigation or project; involves extended time spent on complex problems, etc.

Depth of Knowledge for Social Studies

Level 1: Recall facts, recite information, recognize human rights, etc.

Level 2: Contrasts people’s opinions, places, and events; explain points of agreement and disagreement; distinguish powers and responsibilities of the three branches of government; etc.

Level 3: Use multiple points of view to advance an argument or conclusion; make connections across time, place, or values; use economic principles to critique a treaty and its impact; etc.

Level 4: Often an investigation or project; involves extended time spent on complex problems; plan, research; and prepare a thesis on a compelling question; etc.
Depth of Knowledge for Science

**Level 1:** Recall discrete facts, repeat a definition, perform a well known process, recognize human rights, measure, etc.

**Level 2:** Knowledge-in-use, classify phenomenon, sense making, organize information into a table, explain using own words, straight forward predictions, etc.

**Level 3:** Use science and engineering practices, use evidence to draw a conclusion, design an experiment to answer a question, apply sophisticated reasoning to solve a scientific problem, contrast relevance of multiple theories, etc.

**Level 4:** At least as complex as level 3, often an investigation or project; involves extended time spent; plan, perform, and prepare conclusions for a scientific experiment; authentic iterative and non-linear engagement, research a significant questions; etc.

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Which of these means about the same as the word *gauge*?

- a. balance
- b. measure
- c. select
- a. warn

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A car odometer registered 41,256.9 miles when a highway sign warned of a detour 1,200 feet ahead. What will the odometer read when the car reaches the detour? (5,280 feet = 1 mile)

(a) 42,456.9  
(b) 41,279.9  
(c) 41,261.3  
(d) 41,259.2  
(e) 41,257.1

Did you use the calculator on this question?

☐ Yes  ☐ No

---

Which of these conclusions is best supported by information from the passage?

- a. If a candidate meets the personal and educational qualifications and is in fair physical shape, his or her chances of becoming an agent are very good.
- b. Compared with other law enforcement agencies in the country, the F.B.I. has a low success rate for tracking down and apprehending suspected offenders.
- c. The job of an agent is not for everyone; it takes someone with special training who is not afraid of danger and doesn’t mind being socially isolated at times.
- d. The life of a federal investigator is not as interesting as most people think; agents spend most of their time working at desks.
11/12/2019

121

13

32

34

A) 190
B) 200
C) 290
D) None of the above

It’s still a level 1

As of 2007, Marc Umile had recited (from memory) more digits of Pi (over 15,000) than any other North American.

Difficulty and complexity are related but different.

Difficulty

Complexity

What is the difference in setting?

[Diagram of Difficulty and Complexity]

ROMEO

Venus, a godly place.

[Text: What is the difference in setting?]
Difficult or Complex?

Compare and contrast the setting...

Grade 8 Mathematics Task

Look at the drawing. The numbers alongside each column and row are the total of the values of the symbols within each column and row. What should replace the question mark?

Difficulty & Complexity

1. Find the exact area of a circle with a radius of 3.14 cm.

2. Find the area of the circle shown. The area of a circle can be found using the formula \( A = \pi r^2 \).
1. Solve the linear equation: 
   \[ \frac{1}{3}(m-2) + 1 = \frac{2m}{7} \]

2. Compare the two cell phone plans provided. Which cell phone plan gives you the most value? Be prepared to defend your argument with numbers.

What is the difference in setting?

What is the impact of the different settings on theme?

Review DOK Definitions and Sample Objectives and Items
<table>
<thead>
<tr>
<th>Subject</th>
<th>DOK 1</th>
<th>Depth of Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Language Arts</td>
<td>Requires students to recall or observe facts, definitions, or terms. Involves computing simple algorithms (e.g., sum, quotient). Requires students to make decisions of how to approach a problem. Requires students to compare, classify, organize, estimate or order data. Typically involves two-step procedures. Requires reasoning, planning, or use of evidence to solve problem or algorithm. May involve activity with more than one possible answer. Requires conjecture or restructuring of problems. Involves drawing conclusions from observations, citing evidence and developing logical arguments for concepts. Uses concepts to solve non-routine problems.</td>
<td>Requires students to recall or observe facts, definitions, or terms. Involves computing simple procedures. Requires reasoning, planning, and developing logical arguments. Typically requires extended time to complete problem, but time spent not on repetitive tasks. Requires students to make several connections and apply one approach among many to solve the problem. Involves complex restructuring of data, establishing and evaluating criteria to solve problems.</td>
</tr>
</tbody>
</table>
Getting the Most Out of Depth of Knowledge

Common Core State Standards
Grade 6

<table>
<thead>
<tr>
<th>CCSS</th>
<th>Description</th>
<th>DOK</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.RL.1</td>
<td>Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.</td>
<td></td>
</tr>
<tr>
<td>6.RL.2</td>
<td>Determine a theme or central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.</td>
<td></td>
</tr>
<tr>
<td>6.RL.3</td>
<td>Describe how a particular story’s or drama’s plot unfolds in a series of episodes as well as how the characters respond or change as the plot moves toward a resolution.</td>
<td></td>
</tr>
<tr>
<td>6.RL.4</td>
<td>Explain how an author develops the point of view of the narrator or speaker in a text.</td>
<td></td>
</tr>
</tbody>
</table>

Common Core State Standards
Grade 6 (continued)

<table>
<thead>
<tr>
<th>CCSS</th>
<th>Description</th>
<th>DOK</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.RL.5</td>
<td>Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of a specific word choice on meaning and tone.</td>
<td></td>
</tr>
<tr>
<td>6.RL.6</td>
<td>Analyze how a particular sentence, chapter, scene, or stanza fits into the overall structure of a text and contributes to the development of the theme, setting, or plot.</td>
<td></td>
</tr>
<tr>
<td>6.RL.7</td>
<td>Explain how an author develops the point of view of the narrator or speaker in a text.</td>
<td></td>
</tr>
</tbody>
</table>

6.RL.1.1
Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
6.RL.2.6
Explain how an author develops the point of view of the narrator or speaker in a text.

DOK 1
- Solve the linear equation.
- Correctly spell 10 terms.
- Define the word “liminal.”
- Describe the characteristics of a right triangle.
- Draw a circle, square, rectangle, and triangle.
- Match the carnivore with its prey.

DOK 2
- Summarize the main idea of the article.
- Compare and contrast the roles of a president and the roles of a prime minister.
- Draw a floor plan of this room (to scale).
- Define the difference between a short story and an essay.

DOK 3
- Provide a rationale for your solution to the problem.
- Describe how the story would be different if it were set in the year 2015 instead of 1915.
- Discuss what you think the author of Story A would think about Story B.
- Draw a 5-10 panel cartoon that presents an alternative ending to the story you just read.
- Define the terms and conditions under which children less than 15 years old should be allowed to work.

DOK 4
- Develop a research-based argument for whether or not the U.S. government should provide money to fund space exploration.

Practical exercise in assigning DOK.
REMINDERS....

- Content complexity is a continuum.
- With practice, DOK can be applied consistently.
- The DOK definitions are the arbiter.
- DOK “levels” refer to content complexity and NOT importance or sequence.

Do they match?

910.RH.1.3
Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them.

1. Analyze the events. In which order did they occur?
   - Mia found a lost dog.
   - Luis argued with Mia.
   - The dog’s owners called Mia.

Alignment

LAFS.6.RL.2.5
Analyze how a particular sentence, chapter, scene, or stanza fits into the overall structure of a text and contributes to the development of the theme, setting, or plot.

What is the purpose of this sentence in paragraph 1: “No roads cross it; ponds and lakes freckle its immensity”?

A. It illustrates the theme that human beings should keep the natural world pure and unpolluted.
B. It shows how beautiful the setting seems to Miyax.
C. It helps develop the theme that nature connects all living things together.
D. It emphasizes how the setting of the story creates great challenges for Miyax.
### Depth of Knowledge of Eligible ELA Common Core State Standards

<table>
<thead>
<tr>
<th>Grade</th>
<th>Total</th>
<th>DOK Level</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>35</td>
<td>20</td>
<td>27</td>
<td>24</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>35</td>
<td>18</td>
<td>26</td>
<td>28</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>35</td>
<td>16</td>
<td>30</td>
<td>29</td>
<td>12</td>
<td></td>
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<tr>
<td>6</td>
<td>36</td>
<td>13</td>
<td>25</td>
<td>31</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>36</td>
<td>14</td>
<td>25</td>
<td>31</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>36</td>
<td>13</td>
<td>25</td>
<td>31</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>9-10</td>
<td>36</td>
<td>13</td>
<td>25</td>
<td>31</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>11-12</td>
<td>36</td>
<td>13</td>
<td>25</td>
<td>31</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>285</td>
<td>120</td>
<td>208</td>
<td>236</td>
<td>118</td>
<td></td>
</tr>
</tbody>
</table>

Percentage of Total Standards at DOK Level (Standards may cover a range of DOK levels):

- DOK 1: 42%
- DOK 2: 73%
- DOK 3: 83%
- DOK 4: 41%


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### Florida Analysis of CCSS DOK Levels

#### English Language Arts for Grade Ranges

<table>
<thead>
<tr>
<th>Grade Ranges</th>
<th>Total # Standards</th>
<th>DOK Level</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-2</td>
<td>122</td>
<td>19%</td>
<td>56%</td>
<td>22%</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>3-5</td>
<td>128</td>
<td>8%</td>
<td>39%</td>
<td>50%</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>6-8</td>
<td>123</td>
<td>0%</td>
<td>34%</td>
<td>61%</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>9-12</td>
<td>140</td>
<td>0%</td>
<td>23%</td>
<td>66%</td>
<td>11%</td>
<td></td>
</tr>
</tbody>
</table>

---

### Percent of Items Assessed by States by DOK Levels

(Yuan and Le, 2012)

<table>
<thead>
<tr>
<th>Content Area</th>
<th>DOK Level</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Writing</td>
<td>55%</td>
<td>25%</td>
<td>15%</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>Reading</td>
<td>35%</td>
<td>43%</td>
<td>20%</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Math</td>
<td>57%</td>
<td>40%</td>
<td>3%</td>
<td>0%</td>
<td></td>
</tr>
</tbody>
</table>
Here’s the concern:

![Graph showing DOK levels](image)

(Total > 100% because ranges of DOK were assigned.)

---

**Grade 7 CCSS Mathematics Standards**

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.RP.1</td>
<td>Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.</td>
</tr>
<tr>
<td>7.RP.2</td>
<td>Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. c. Represent proportional relationships by equations. d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.</td>
</tr>
<tr>
<td>7.RP.3</td>
<td>Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</td>
</tr>
</tbody>
</table>

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**Depth of Knowledge of Eligible Math Common Core State Standards**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Total</th>
<th>DOK 1</th>
<th>DOK 2</th>
<th>DOK 3</th>
<th>DOK 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>25</td>
<td>24</td>
<td>24</td>
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<td>4</td>
<td>29</td>
<td>26</td>
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<td>5</td>
<td>29</td>
<td>26</td>
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<tr>
<td>6</td>
<td>29</td>
<td>29</td>
<td>20</td>
<td>2</td>
<td>0</td>
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<tr>
<td>7</td>
<td>24</td>
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<td>22</td>
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<tr>
<td>8</td>
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<tr>
<td>Number and Quantity</td>
<td>27</td>
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<td>15</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Algebra</td>
<td>27</td>
<td>26</td>
<td>21</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Functions</td>
<td>28</td>
<td>27</td>
<td>24</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Geometry</td>
<td>43</td>
<td>24</td>
<td>36</td>
<td>19</td>
<td>1</td>
</tr>
<tr>
<td>Statistics and Probability</td>
<td>31</td>
<td>27</td>
<td>29</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>316</strong></td>
<td><strong>282</strong></td>
<td><strong>250</strong></td>
<td><strong>67</strong></td>
<td><strong>1</strong></td>
</tr>
</tbody>
</table>

**Percentage of Total Standards at DOK Level**

- Number of Standards: 316
- DOK Level 1: 89%
- DOK Level 2: 79%
- DOK Level 3: 21%
- DOK Level 4: < 1%
Florida Analysis of DOK Levels CCSS Mathematics for Grades 3-5

<table>
<thead>
<tr>
<th></th>
<th>Total #</th>
<th>DOK Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stds</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>Operations &amp; Algebraic Thinking</td>
<td>17</td>
<td>7 9 1</td>
</tr>
<tr>
<td>Number &amp; Operations-Base Ten</td>
<td>16</td>
<td>9 7</td>
</tr>
<tr>
<td>Number &amp; Operations-Fractions</td>
<td>17</td>
<td>3 11 3</td>
</tr>
<tr>
<td>Measurement &amp; Data</td>
<td>20</td>
<td>7 12 1</td>
</tr>
<tr>
<td>Geometry</td>
<td>9</td>
<td>3 6</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
<td>29 45 5</td>
</tr>
<tr>
<td>Percent</td>
<td></td>
<td>37% 57% 6%</td>
</tr>
<tr>
<td>Smarter Balanced %</td>
<td></td>
<td>99% 73% 14%</td>
</tr>
</tbody>
</table>

Florida Analysis of DOK Levels CCSS Mathematics for Grades 6-8

<table>
<thead>
<tr>
<th></th>
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<th>DOK Level</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Stds</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>6</td>
<td>29</td>
<td>6 22 1</td>
</tr>
<tr>
<td>7</td>
<td>24</td>
<td>2 19 3</td>
</tr>
<tr>
<td>8</td>
<td>28</td>
<td>5 19 4</td>
</tr>
<tr>
<td>Total</td>
<td>81</td>
<td>13 60 8</td>
</tr>
<tr>
<td>Percent</td>
<td></td>
<td>16% 74% 10%</td>
</tr>
<tr>
<td>SB %</td>
<td>81</td>
<td>90% 80% 23%</td>
</tr>
</tbody>
</table>
Florida Analysis of DOK Levels of CCSS Mathematics for High School

<table>
<thead>
<tr>
<th>Total # Standards</th>
<th>DOK Level</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Number and Quantity</td>
<td>27</td>
</tr>
<tr>
<td>Functions</td>
<td>28</td>
</tr>
<tr>
<td>Algebra</td>
<td>27</td>
</tr>
<tr>
<td>Geometry</td>
<td>43</td>
</tr>
<tr>
<td>Statistics and Probability</td>
<td>31</td>
</tr>
<tr>
<td>Total</td>
<td>156</td>
</tr>
<tr>
<td>Percent</td>
<td>19%</td>
</tr>
<tr>
<td>Smarter Balanced %</td>
<td>156</td>
</tr>
</tbody>
</table>

DOK of All Literacy Common Core State Standards (based on WestEd data)

CCSS Grade 4 NBT.5
Multiply two two-digit numbers, using strategies based on place value and the properties of operations.
Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
TIMSS 2011 Grade 8 Item M 05228
Which shows a correct method for finding 1/3 -1/4?
A. (1-1) / (4-3) (32%)
B. 1 / (4-3) (26%)
C. (3-4) / (3*4) (10%)
D. (4-3) / (3*4) (29%)

Learning with Understanding
1. Constructing Relationships
2. Extending and Applying Knowledge
3. Justifying and Explaining Generalizations and Procedures
4. Making Knowledge One’s Own


Strategies For Using DOK To Improve Learning for All Students
1. Clarify important learning outcomes and priorities.
2. Plan and deliver instruction considering students’ current level of understanding.
3. Select and design assessments that are lower in difficulty but challenging in complexity.
4. Align standards, instruction, and assessments.

Assessment Items: Factors that Can Influence DOK
- Question
  - DOK 1 What, where, find, compute
  - DOK 2 Why or why not, compare
  - DOK 3 Imply, infer
- Context
  - DOK 1 Routine or none
  - DOK 2 Typical, routine, basic
  - DOK 3-4 Fix, verify, and justify, hypothetical

But REMEMBER: The DOK of an item depends on the main challenge for a typical student.
How Does Item Type Influence DOK?

- multiple choice
- constructed response
- cloze
- FIB
- sequencing
- drag-and-drop
- multi-part item

Summary and Takeaway Themes

- Successful application of the language of DOK within an organization is an ongoing process.
- Complexity and difficulty are related but different.
- All levels of DOK are important for all students.
- DOK does not prescribe a learning sequence.
- It’s critical to consider alignment of content complexity (DOK) among standards and assessments.
- Consider appropriate distribution of assessment items by DOK level.

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