Teaching with Depth
An Understanding of Webb’s Depth of Knowledge
**DOK (Depth of Knowledge)**

**Level 4: Extended Reasoning**
- A. Requires complex reasoning, planning, and thinking (generally over extended periods of time) for the investigation.
- B. Assessment activities have multiple steps with extended time provided.
- C. Students may be asked to relate concepts within the content area and among other content areas.
- D. Students make real-world applications in new situations.

**Level 3: Strategic Reasoning**
- A. Focus is on reasoning & planning in order to respond (e.g., write an essay, apply in new/novel situation).
- B. Complex and abstract thinking is required.
- C. Often need to provide support for reasoning or conclusions drawn.
- D. More than one “correct” response or approach is often possible.

**Level 2: Skill/Concept**
- A. Focus is on applying skills and concepts (in a familiar/typical situation), relationships (compare, cause-effect), main ideas.
- B. Requires deeper knowledge than definition.
- C. Explaining how or why.
- D. Making decisions.
- E. Estimating, interpreting in order to respond.
- F. One right answer

"He who learns but does not think, is lost! He who thinks but does not learn is in great danger." Confucius
We will be able: to distinguish the difference between DOK and Bloom’s Taxonomy to assist in creating an assessment or task at a level two or three DOK (to help when creating exit tickets) by focusing on complexity of content standards and completing a sorting activity.
Engage

• Greet students at the door with a handshake at the beginning of each class.
• This draws them into a relationship with us.
• Start the day with a positive greeting
• Affirm each student, welcome them, they have your full attention
Engage

• We are also modeling social and professional skills.
• When we start with ENGAGE, we are preparing the way for the students to be involved with us in the learning process.
Cues People Notice

• Eye contact
• Facial expression
  • Tone of Voice
  • Hand shake itself
• Dress and Grooming
  • Posture
• Level of relaxation
  • Energy
Efforts to Improve Student Learning

- Class Size Reduction
- Whole School Reform
- Re-vamp Class time (varied bell schedules, year-round schools, block schedules)
- Innovative Curriculum
- Traditional Curriculum (Back to Basics)
- Remediation Programs (Tracking, two-year algebra, etc.)
- Standards Based Education (Pacing Guides, Benchmark Test, Data Driven, etc.)
- High-stakes Accountability (Rewards, Sanctions, Differentiated Accountability)
- Choice (charter schools, magnet schools, etc.)
- Centralize Leadership and Policies (state or national)
- Professional Learning Communities

Huff
So...what is the most significant factor in student learning?

...the teacher
“What Matters Very Much is Which Classroom?”

“If a student is in one of the most effective classrooms he or she will learn in 6 months what those in an average classroom will take a year to learn. And if a student is in one of the least effective classrooms in that school, the same amount of learning takes 2 years.”
Research has indicated that... “teacher quality trumps virtually all other influences on student achievement.”

(e.g., Darling-Hammond, 1999; Hamre and Pianta, 2005; Hanushek, Kain, O’Brien and Rivken, 2005; Wright, Horn and Sanders, 1997)
What is Depth of Knowledge (DOK)?

• A scale of cognitive demand (thinking) to align standards with assessments

• Based on the research of Norman Webb, University of Wisconsin Center for Education Research and the National Institute for Science Education

• Defines the “ceiling” or highest DOK level for each Core Content standard for the state assessment

• Guides item development for state assessments
Webb’s Four Levels of Cognitive Complexity

- Extended Thinking
- Strategic Thinking
- Skills and Concepts
- Recall and Reproduction

The focus is on strategic thinking, so there can be multiple right answers!

There is usually a right answer!
Making Sense & Worthwhile Tasks

“What are our Kids really being asked to do?”

“How are we keeping up with Cognitive Demand (man)?”
Cognitive Demand

• The kind and level of thinking required of students to successfully engage with and solve a task

• Ways in which students interact with content
Depth of Knowledge (DOK)

Every Student Succeeds Act (ESSA-formerly known as No Child Left Behind) requires assessments to “measure the depth and breadth of the state academic content standards for a given grade level”.

Rider
Why Depth of Knowledge?

Focuses on complexity of content standards in order to successfully complete an assessment or task. The outcome (product) is the focus of the depth of understanding.
Why Depth of Knowledge (DOK)?

Mechanism to ensure that the intent of the standard and the level of student demonstration required by that standard matches the assessment items (required under ESSA)

To ensure that teachers are teaching to a level that will promote student achievement
DOK is NOT...

- a taxonomy (Bloom’s)
- the same as difficulty
- about using “verbs”
It’s NOT about the verb...

The Depth of Knowledge is NOT determined by the verb (Bloom’s Taxonomy), but by the context in which the verb is used and the depth of thinking required.
Verbs are not always used appropriately...

Words like explain or analyze have to be considered in context.

- “Explain to me where you live” does not raise the DOK of a simple rote response.
- Even if the student has to use addresses or landmarks, the student is doing nothing more than recalling and reciting.
Same Verb—Three Different DOK Levels

DOK 1- Describe three characteristics of metamorphic rocks. (Requires simple recall)

DOK 2- Describe the difference between metamorphic and igneous rocks. (Requires cognitive processing to determine the differences in the two rock types)

DOK 3- Describe a model that you might use to represent the relationships that exist within the rock cycle. (Requires deep understanding of rock cycle and a determination of how best to represent it)
Webb's Depth of Knowledge "The Chocolate Chip Cookie Model"

https://www.youtube.com/watch?v=YXXgloyYFkw
DOK is about intended outcome, not difficulty

DOK is a reference to the complexity of mental processing that must occur to answer a question, perform a task, or generate a product.

- Adding is a mental process.
- Knowing the rule for adding is the intended outcome that influences the DOK.
- Once someone learns the “rule” of how to add, 4 + 4 is DOK 1 and is also easy.
- Adding 4,678,895 + 9,578,885 is still a DOK 1 but may be more “difficult.”
DOK is not about difficulty...

- Difficulty is a reference to how many students answer a question correctly.

“How many of you know the definition of exaggerate?”
DOK 1 – recall
If all of you know the definition, this question is an easy question.

“How many of you know the definition of prescient?”
DOK 1 – recall
If most of you do not know the definition, this question is a difficult question.
DOK is about complexity

- The intended student learning outcome determines the DOK level.

- Every objective in the common core frameworks has been assigned a DOK level.

- Instruction and classroom assessments must reflect the DOK level of the objective or intended learning outcome.
Quick Quiz

1) Give an example of a statement that uses a verb that “sounds” like a high DOK but is used inappropriately.

2) Fill in the blanks: What _______ the verb is more _______ than the verb itself when deciding the DOK level.

3) What is the difference between difficulty and complexity?

4) What really determines the DOK level?
Quick Quiz Answers

1) Give an example of a statement that uses a verb that “sounds” like a high DOK but is used inappropriately. answers vary

2) Fill in the blanks: What follows the verb is more important than the verb itself when deciding the DOK level.

3) What is the difference between difficulty and complexity? answers vary, but do not rely on the verb

4) What really determines the DOK level? the intended learning outcomes
Strategic Thinking: Level 3

• Requires deep understanding exhibited through planning, using evidence, and more demanding cognitive reasoning

• The cognitive demands are complex and abstract

• An assessment item that has more than one possible answer and requires students to justify the response would most likely be a Level 3
DOK Level 3: Strategic Thinking

Examples:

• Compare consumer actions and analyze how these actions impact the environment

• Analyze or evaluate the effectiveness of literary elements (e.g., characterization, setting, point of view, conflict and resolution, plot structures)

• Solve a multiple-step problem and provide support with a mathematical explanation that justifies the answer
DOK Level 3 Examples

- Develop a scientific model for a complex idea
- Propose and evaluate solutions for an economic problem
- Explain, generalize or connect ideas, using supporting evidence from a text or source
- Create a dance that represents the characteristics of a culture
Extended Thinking: Level 4

- Requires high cognitive demand and is very complex
- Students are expected to make connections, relate ideas within the content or among content areas, and select or devise one approach among many alternatives on how the situation can be solved
- Due to the complexity of cognitive demand, DOK 4 often requires an extended period of time
“Extending the length of an activity alone does not necessarily create rigor!”

<table>
<thead>
<tr>
<th>Task</th>
<th>Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collecting data samples over several months</td>
<td>Recall</td>
</tr>
<tr>
<td>Organizing the data in a chart</td>
<td>Skills/ concepts</td>
</tr>
<tr>
<td>Using this chart to make and justify predictions</td>
<td>Strategic Thinking</td>
</tr>
<tr>
<td>Developing a generalized model from this data and applying it to a new situation</td>
<td>Extending Thinking</td>
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</tbody>
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Questions to think about...

- If 10-20% of the questions on AIR are low Level of Complexity...How much class time would we devote to DOK Level 1 thinking?

- If 80% of the question on AIR (and in life) require Moderate to High levels of Complexity....What are we doing to promote these complex levels of higher order thinking?
DOK Sorting Activity

You should have:

- 6 - DOK 1
- 4 - DOK 2
- 5 - DOK 3
- 1 - DOK 4
### DOK 1
- Solve the linear equation.
- Correctly spell 10 terms.
- Define the word “luminal.”
- Describe the characteristics of a right triangle.
- Draw a circle, square, rectangle, and triangle.
- Match the carnivore and its prey.

### DOK 2
- Summarize the main idea of the article.
- Compare and contrast the roles of the president and the roles of the prime minister.

### 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 the 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.
The alignment between tasks, standards, and assessments allows for cognitive complexity with a deeper understanding.

“A mile wide and an inch deep”
Key Points

- DOK 1 + DOK 1 + DOK 1 = 1
- Depths of knowledge classification is based on the task, not the student
- DOK is different from task/item difficulty
- DOK ratings aid in alignment of standards and assessment, and therefore instruction
Remember DOK is...

...descriptive
...focuses on how deeply a student has to know the content in order to respond
...NOT the same as difficulty.
...NOT the same as Bloom’s Taxonomy
The Heart of the Matter is the Depth of Knowledge
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