Webb’s Depth of Knowledge (DOK)

Nebraska Department of Education
2015
Depth of Knowledge (DOK)

- Adapted from the model used by Norman Webb, University of Wisconsin, to align standards with assessments
- Used by the *Council of Chief State School Officers (CCSSO)* for assessment alignment in more than ten states
Depth of Knowledge

• Focuses on content standard in order to successfully complete an assessment/standard task.
• Descriptive, not a taxonomy
• Not the same as difficulty
Why Depth of Knowledge?

• No Child Left Behind (NCLB) requires assessments to “measure the depth and breadth of the state academic content standards for a given grade level” (U.S. Department of Education, 2003, p. 12)
Why Depth of Knowledge?

• 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 NCLB)

• Provides cognitive processing ceiling (highest level students can be assessed) for item development
Depth of Knowledge

Webb’s Depth of Knowledge levels:

Recall and Reproduction:  Level 1
Skills & Concepts:       Level 2
Strategic Thinking:      Level 3
Extended Thinking:       Level 4
Recall and Reproduction: Level 1

DOK 1 requires recall of information, such as a fact, definition, term, or performance of a simple process or procedure.

Answering a Level 1 item can involve following a simple, well-known procedure or formula. Simple skills and abilities or recall characterize DOK 1.
DOK Level 1 Examples

• List animals that survive by eating other animals.
• Locate or recall facts explicitly found in text
• Describe physical features of places
• Determine the perimeter or area of rectangles given a drawing or labels
• Identify elements of music using musical terminology
• Identify basic rules for participating in simple games and activities
Skills/Concepts: Level 2

DOK 2 includes the engagement of some mental processing beyond recalling or reproducing a response. Items require students to make some decisions as to how to approach the question or problem. These actions imply more than one mental or cognitive process/step.
DOK Level 2 Examples

- Compare desert and tropical environments
- Identify and summarize the major events, problem, solution, conflicts in literary text
- Explain the cause-effect of historical events
- Predict a logical outcome based on information in a reading selection
- Explain how good work habits are important at home, school, and on the job.
- Classify plane and three dimensional figures
- Describe various styles of music
DOK 3 requires deep understanding as exhibited through planning, using evidence, and more demanding cognitive reasoning. The cognitive demands at Level 3 are complex and abstract.

An assessment item that has more than one possible answer and requires students to justify the response they give would most likely be a Level 3.
DOK Level 3 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
DOK 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 have to 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.
However, extended time alone is not the distinguishing factor.

<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>
</tr>
</tbody>
</table>
Extended Reasoning/Thinking Examples: Level 4

- Gather, analyze, organize, and interpret information from multiple (print and non print sources) to draft a reasoned report
- Analyzing author’s craft (e.g., style, bias, literary techniques, point of view)
- Create an exercise plan applying the “FITT (Frequency, Intensity, Time, Type) Principle”
Extended Reasoning/Thinking Examples: Level 4

- Analyze and explain multiple perspectives or issues within or across time periods, events, or cultures
- Specify a problem, identify solution paths, solve the problem, and report the results
- Write and produce an original play
• The Depth of Knowledge is **NOT** determined by the verb, but the context in which the verb is used and the depth of thinking required.
• **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)*

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

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

Same verb—three DOK levels
DOK levels can be cumulative

An item/standard written to DOK 3 often contains DOK 1 and DOK 2 level demands
## Determining DOK: Science Example

<table>
<thead>
<tr>
<th>Sample Science Assessment Limit (based on Webb)</th>
<th>DOK Ceiling Level</th>
<th>Potential DOK Levels for Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example A: Perform a simple science process or a set procedure to gather data</td>
<td>1</td>
<td>1 (Measure temperature of water)</td>
</tr>
<tr>
<td>Example B: Represent data collected over a period time, making comparisons and interpretations</td>
<td>2</td>
<td>1 (Measure temperature of water at different times/places)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 (Construct a graph to organize, display, and compare data)</td>
</tr>
<tr>
<td>Example C: Interpret data collected for a research question for a scientific problem related to your environment</td>
<td>3</td>
<td>1 (Measure temperature of water at different times/places)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 (Construct a graph to organize, display, and compare data)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 (Design an investigation to explain the affect of varying temperatures of the river in different locations)</td>
</tr>
</tbody>
</table>
Remember...

• Depth of Knowledge (DOK) is a scale of cognitive demand.

• DOK requires looking at the assessment item/standard- **not student work**-in order to determine the level. DOK is about the item/standard- **not the student**.

• The context of the assessment item/standard must be considered to determine the DOK- **not just a look at what verb was chosen**.