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ELL Depth of Knowledge

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Overview: *Why DOK? Why not Bloom's?*

The Common Core State Standards ask students to demonstrate deep conceptual understanding through the application of content knowledge and skills in new situations. The Smarter Balanced Assessment Consortium has aligned their assessments to Webb's DOK.

Background

In 1956, Bloom's Taxonomy was developed as a way to classify intellectual behaviors important in learning. In 2001, we were presented with a revised taxonomy table that applied two dimensions, cognitive processes (the verbs) and the knowledge (the nouns) used to articulate educational objectives. This restructuring of the original taxonomy recognizes the importance of the interaction between the content taught – characterized by factual, conceptual, procedural, and metacognitive knowledge – and the thought processes used to demonstrate learning.

Depth of Knowledge Levels

Depth of knowledge forms another important perspective of cognitive complexity. Probably the best known work in the area of depth of knowledge is that of Norman Webb (1997, 1999). Webb describes his DOK levels as "nominative" rather than as a taxonomy; DOK levels name four different ways students interact with content. Each level is dependent upon how **deeply** students understand the content in order to respond, not simply the "verb" used. *The Webb levels do not necessarily indicate degree of "difficulty" in that Level 1 can ask students to recall or restate a simple or a much more complex concept, the latter being much more difficult. Conversely, depth of understanding a concept is required to be able to explain how/why a concept works (Level 2), apply it to real-world phenomena with justification/supporting evidence (Level 3), or to integrate one concept with other concepts or other perspectives (Level 4)*

Source: Cognitive complexity: Applying Webb DOK Levels to Bloom's Taxonomy, Karin K. Hess, National Center for Assessment, Dover, NH (2005; updated 2006) khess@nciea.org

This guide was developed for the Connecticut RESC Alliance in collaboration with Karin K. Hess. It consolidates numerous tools educators use to implement Webb's Depth of Knowledge for curriculum and assessment: Hess' Cognitive Rigor Matrices for ELA-Social Studies, Writing, and Math-Science; Norman Webb's Alignment Tool from Wisconsin Center of Educational Research with Gary's Cook's Linguistic Difficulty Levels for ELLs; and Bonnie Campbell Hill's Developmental Continuums. (2001), Learning Progressions for English as an Additional Language, Christopher Gordon Publishers.

Depth of Knowledge Levels

Level 1 **Recall & Reproduction**	Requires recall or recognition of information or concept, such as a fact, definition, term, or performance of a simple process or procedure. Responding to a Level 1 involves following a simple, well-known procedure or formula. Simple skills and abilities or recall characterize this level. *Key words that signify a Level 1 include identify, use, recognize, measure and recall.*
Level 2 **Basic Application of Skills/Concepts**	Includes the engagement of some mental processing beyond recalling or reproducing a response. It requires both comprehension and subsequent processing of content. Level 2 require students to make some decisions about how to approach the question or problem, and the content knowledge or process involved is more complex than in Level 1. *Key words that signify Level 2 include summarize, interpret, infer, classify, organize, collect, display, compare, estimate, and make observations.*
Level 3 **Strategic Thinking**	Higher order thinking and deep knowledge become a focus at Level 3. Students may be asked to explain their thinking, generalize or connect ideas. Level 3 involves cognitive demands that are complex and abstract with often more than one possible answer, and/or more demanding reasoning, such as: developing a plan or sequence of steps to approach a problem/issue, applying prior knowledge, drawing conclusions from observations, supporting thinking, citing evidence, and developing logical arguments. *Key words/phrases that signify Level 3 include analyzing similarities and differences in issues or problems; editing and revising for specific criteria/purpose; using voice appropriate to purpose and audience; solving non-routine problems; and applying concepts to new situations.*
Level 4 **Extended Thinking**	Higher level thinking is central to Level 4. This level requires complex reasoning, experimental design and planning and will probably be an extended activity over time. Tasks have a high cognitive demand and are very complex requiring significant conceptual understanding. Students are required to make several connections and relate ideas both within the content area and/or among content areas and/or disciplines using multiple sources. *Key words/phrases that signify Level 4 include gather, analyze and evaluate information across multiple sources to draw conclusions; articulate a new voice, new knowledge or perspective; conduct a complete investigation, from specifying a problem to designing and carrying out an experiment to analyzing its data and forming conclusions; and describe and illustrate how common themes and concepts are found across time and place/across multiple sources of fiction/informational text.*

DOK Level 1 - *Recall & Reproduction*

Teacher Role	Student Role
Questions to direct or focus attention	Listens, Recognizes, Reproduces (e.g., echoes, copies), Absorbs
Directs, leads	Responds nonverbally (nods, gestures, etc.) and verbally
Demonstrates, shows	Restates, describes
Defines, Provides examples	Translates single words, common/stock phrases
Examines, breaks down	Follows simple directions, routines
Uses concrete objects, nonverbal and visual cues to teach concepts and vocabulary	Remembers, Memorizes, Demonstrates, Locates

DOK Level 1 and ELLs

- The tasks at this level are good for students in LAS level 1 (pre-production)
- May be used in LAS levels 2 -5 to scaffold students' learning
- The tasks at this level are very basic, there is little extended thinking.
- The tasks require students to recall, reproduce knowledge and or skills
- Students may not have the language necessary to respond, therefore, teachers may need to use the following strategies:
  - Non-linguistic representations
  - Cooperative learning (peer support)
  - 6-step vocabulary process
  - Cues, questions, and organizers
  - Repetition & practice
  - Use of technology
- Teachers must front load language needed to complete the tasks

Potential Learning Tasks or Products:

- Cut out/draw a picture that illustrates an event, process, or story
- Match objects or words with story characters, events
- Represent math relationships using manipulatives, words, pictures, or symbols
- Compose a list of key words you know about… to show…
- Complete routine calculation and measurement tasks involving only one step
- Memorize, reproduce math facts
- Recognize, locate, or retrieve basic facts, details or ideas
- Label, reproduce, or locate information in a diagram/picture/map
- Brainstorm words/ideas related to a topic/concept
- Describe/explain/locate who, what, where, when
- Complete/fill in sentence frames; write complete sentences
- Word analysis (break words into their parts; build new words)
- Keep a vocabulary journal; identify nouns, verbs, synonyms, etc.
- Locate or retrieve information in verbatim form
- Memorize lines in a play or poem
- Explain/show/act out how to perform a particular task
- Decode/sound out words; read orally

DOK Level 2 - *Basic Application of Skills & Concepts*

Teacher Role	Student Role
Questions to differentiate, infer, or check conceptual understanding	Demonstrates conceptual knowledge using verbal/nonverbal/or combination of both (draws, acts out, etc.)
Provides organizers that help make conceptual connections	Constructs models, Organizes/reorganizes information to show relationships
Shows, Models, "Thinks aloud"	Compiles/Illustrates/Elaborates/Discusses
Uses verbal and visual cues and Interactive approaches to teach concepts and vocabulary	Solves routine, multi-step problems with decision points

DOK Level 2 and ELLs

- The tasks at this level are good for students in LAS levels 2 (with support) and LAS level 3 to 5
- The tasks at this level demand some mental processes beyond recalling
- The tasks require students to apply, compare and contrast, convert information from one form to another, look for cause and effect, categorize, explain issues and problems
- The tasks expect students to use context clues to identify the meaning of words
- Students need to use information in a different context than the one learned
- Comprehensible input is key at this level, therefore, teachers may need to use the following strategies:
  - Cooperative Learning
  - Generating Hypothesis
  - Summarizing and Note Taking
  - Homework
  - Cues, Questions, and Advance Organizers
  - Non-linguistic representations
  - Similarities and Differences
  - Academic Vocabulary
  - Use of technology
- Teachers must front load language needed to infer (close reads) and complete tasks

Potential Learning Tasks or Products:

- Select an appropriate procedure according to criteria and perform it
- Complete/create a timeline/make a chart/prepare a flow chart illustrating a sequence or connections
- Make a cartoon strip to show sequence of a process or story line
- Use a concept map to show a process or describe a topic/word; Organize information in a story map
- Make a puzzle or game about a topic
- Make a model based on criteria provided to show how something works
- Classify objects according to different properties with explanation of reasoning
- Develop a flow chart that shows interactions/connections
- Summarize a piece of text or event
- Take or organize notes
- Write journal or learning log entries (Using L1 and/or L2)
- Explain the meaning of a concept using words, actions, objects, and/or visuals
- Fill in a compare/contrast Venn diagram
- Complete multi-step calculations/collect, organize and display data
- Make a captioned/labeled scrapbook about an area of study, given criteria
- Create a PowerPoint with the purpose to inform, summarize
- Write a paragraph applying basic structures or templates
- Make and record observations
- Identify signal words and structures in a text, that indicate cause/effect, compare/contrast, problem/solution
- Extend a pattern; Apply or use formulas
- Explain steps followed (math/science); keep a science log
- Participate in simulation activities, small group discussions

DOK Level 3 - *Strategic Thinking*

Teacher Role	Student Role
Questions to probe reasoning and underlying thinking, asks open-ended questions, acts as a resource and coach	Uses print and nonprint language to show thinking (Uses linguistic and/or semi-linguistic representations)
Determines when/where (text, concept) depth and exploration are most appropriate	Plans, initiates questions, tests ideas/solutions
Provides criteria and examples for making judgments and supporting claims	Selects relevant and credible supporting evidence for analyses, critiques, debates, claims and judgments
Encourages multiple approaches and possible solutions/formats	Sustains inquiry into topics or deeper/more complex problems
Guides/"Thinks aloud"	Debates/Disputes/Defends
Uses verbal, visual, multi-media as cues/context to teach concepts and vocabulary	Examines/thinks deeply; Applies to the real world

DOK Level 3 and ELLs

- The tasks at this level are good for students in LAS levels 2 (high) and LAS Levels 3 to 5
- The tasks at this level demand use of higher order processes (e.g., deeper analysis)
- The tasks require students to state their own reasoning/analyze/explain and support with evidence/generalize/and create a product
- The tasks require a project-based learning that is cross curricular
- The tasks require that students understand authors' craft and purpose to interpret and analyze and critique readings
- Students need to analyze data and draw conclusions/interpret data from complex graphs/explain thinking when more than one solution is possible
- The tasks may require that students develop alternate solutions
- Comprehensible input is critical and students may lack the academic language necessary to perform at this level, therefore, teachers may need to use the following strategies:
  - Cooperative Learning
  - Problem solving tasks
  - Generating Hypothesis
  - 6 step vocabulary process
- Teachers should consider at this level the following strategies:
  - Debate
  - Role Playing
  - Structured Controversy
  - Guided Inquiry and Modeled Inquiry
  - Journaling
  - Group Problem-solving Tasks
- Teachers must front load language needed to perform at this level and assist students by constantly paraphrasing at a higher level
- If ELLs are not engaged in their groups, teachers should consider stepping in and assigning specific roles to the members of the group

Potential Learning Tasks or Products:

- Answer open-ended questions, supporting ideas with examples/ citing evidence
- Write a multi-paragraph report/essay/PowerPoint about an area of study using appropriate voice for purpose and audience
- Prepare and conduct a debate; Propose solutions
- Write a persuasive speech arguing for/against with claim, evidence and conclusion
- Write a letter to… about change needed, specifying reason and including supporting evidence
- Explain and/or work with abstract terms and concepts
- Apply a concept in other contexts
- Solve complex calculation problems that draw on multiple processes
- Analyze data to create charts, tables, and graphs to convey complex information
- Examine theme, tone, or plots/subplots in print and non-print /multimedia text
- Conduct designed experiments; Draw conclusions based on observations/data
- Support inference, interpretation, or conclusion with evidence from the text
- Devise an approach among many, given alternatives to conduct/ present project
- Solve non-routine mathematics problems
- Support ideas with details and examples
- Generate charts/graphs/tables that explain data in different ways
- Design surveys or questionnaires to gather and analyze information collected
- Evaluate relevancy, accuracy, and completeness of class projects, using specific criteria/rubric to evaluate
- Create a video, a new game, a blog, a new menu, a multi-level presentation, play
- Write a jingle, a newspaper article, a story, a song/poem, a review to… for…

DOK Level 4 - *Extended Thinking*

Teacher Role	Student Role
Questions to extend thinking and broaden perspectives	Creates by synthesizing multiple resources, perspectives, etc
Facilitates teaming, collaboration, self-evaluation	Plans, organizes, and modifies to create concrete tangible products
Strategically groups students	Takes risks/actively engages/plans, researches
Assists ELLs and classmates with text and resources at their level	Formulates/Thinks deeply

DOK Level 4 and ELLs

- The tasks at this level are good for students in LAS levels 1 to 5
- The tasks at this level demand collaboration; it is key that ELLs are strategically and heterogeneously grouped
- The tasks require students to use higher order thinking such as synthesis and reflection over a period of time. The expectation is for students to plan and adjust a course of action that will lead them to a product.
- The tasks require a project-based learning that is cross curricular
- The tasks require that students organize the information and work with minimal prompting; nevertheless, teachers must monitor that ELLs are actively engaged and have a meaningful role within their groups
- Comprehensible input is critical at this level; therefore, teachers should consider allowing students to read references in their native language. This will enhance the meaningful contribution of ELLs to the project. Also, teachers must find English material at their independent level
- Teachers should consider at this level the following strategies:
  - Modeled and Free Inquiry
  - Case Studies
  - Multiple technology resources
  - Problem-based learning
- Group Research Projects
- If ELLs are not engaged in their groups, teachers should consider stepping in and assigning specific roles to the members of the group

Potential Learning Tasks or Products:

- Synthesize and analyze information across multiple sources or texts
- Select or devise an approach among many alternatives to research and solve a problem
- Investigate a real-world problem with unpredictable outcomes and propose a solution. Create the judgment or policy-based argument to support claim
- Design a mathematical model to inform and solve a practical or abstract problem
- Develop a novel way to…
- Use criteria to evaluate relevancy, accuracy, and completeness of information from multiple sources
- Illustrate how multiple themes (historical, geographic, social) are interrelated
- Write informed opinions/write different types of argument essays
- Take multiple perspectives on a topic, issue, etc.
- Develop generalizations of the results obtained and the strategies used (from investigations and readings) and apply them to a new problem
- Explain how concepts or ideas specifically relate to other content areas, other domains, or concepts
- Examine and explain alternative perspectives across a variety of sources
- Write an analysis of two selections, identifying the common theme and providing evidence for the stated conclusion
- Use data from a complex experiment that is novel to the student, to deduce the fundamental relationship between several controlled variables

DOK Insites

- DOK is a reference to the complexity of mental processing that must occur to answer a question, perform a task, or generate a product.
- DOK is not meant to be used as a taxonomy. An activity that aligns to a particular DOK level is not always "easier" than an activity that aligns to a DOK level above it.
- The complexity of both the content and the task required are used to determine the DOK levels, not the grade level or innate ability of students. Complexity and difficulty are NOT the same. Difficulty refers to how easy or hard something is. An example: Once someone learns the "rule" of how to add. Adding 4 + 4 is DOK 1 and is also easy to do. Adding 4,678,895 + 9,578,885 is still a DOK 1 but may be more "difficult." Or, a task where students recite a simple fact or a much more complex abstract theory are both DOK 1, even though the abstract theory is much more difficult to memorize and restate. Neither task asks for much depth of understanding of the content.
- The DOK levels describe four different and deeper ways a student might interact with content. An activity that aligns to a particular level is not always easier than an activity that aligns to a DOK level above it.
- Verbs (Bloom's Taxonomy) alone do not determine the DOK level of a task. DOK focus is on how deeply students need to know content to be able to generate a specific type of response. It is what comes after the verb that indicates complexity.
- DOK descriptors offer a common language to analyze the "rigor," or cognitive demand, in assessments, curricular units, lessons, and learning tasks.
- DOK provides educators a lens to guide the creation of more cognitively engaging and challenging tasks