A Guide for Using

Webb's Depth of Knowledge

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This guide was developed by Karin K. Hess for C2 Collaborative, Inc. It consolidates numerous tools educators use to implement Webb's Depth of Knowledge for curriculum and assessment. The examples herein are drawn from several classroom-tested DOK tools: Hess' Cognitive Rigor Matrices for ELA, Social Studies, Writing, and Math-Science developed by Karin Hess, at the Center for Assessment; Norman Webb's Alignment Tool from Wisconsin Center of Educational Research; and the Florida Department of Education's guide for Depth of Knowledge Questions.

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An Educator's Guide for Applying Webb's Depth-of-Knowledge Levels to the College and Career Readiness Standards

Overview

At the heart of College and Career Readiness is the need to increase the level of rigor in our classrooms for all students. The College and Career Readiness are a step in the right direction. However, the standards alone will not bring rigor to our classrooms. The implementation of these standards requires practical tools to develop local curricula and assessments and to promote classroom discourse aligned to higher levels of cognitive demand.

Norman Webb's Depth-of-Knowledge (DOK) schema has become one of the key tools educators can employ to analyze the cognitive demand (complexity) intended by the standards, curricular activities, and assessment tasks. Webb (1997) developed a process and criteria for systematically analyzing the alignment between standards and test items in standardized assessments. Since then the process and criteria have demonstrated application to reviewing curricular alignment as well. The model categorizes assessment tasks by different levels of cognitive expectation, or depth of knowledge, required to successfully complete the task. Hess (2004-2012) further articulated the model with content-specific descriptions for use by classroom teachers and organizations conducting alignment studies. The table below outlines the Webb DOK levels:

DOK Level	Description of Level
1	Recall & Reproduction
2	Skills & Concepts
3	Strategic Thinking & Reasoning
4	Extended Thinking

Level 1: Recall & Reproduction

Curricular elements that fall into this category involve basic tasks that require students to recall or reproduce knowledge and/or skills. The subject matter content at this level usually involves working with facts, terms, details, calculations, principles, and/or properties. It may also involve use of simple procedures or formulas. There is little or no transformation of the target knowledge or skill required by tasks that fall into this category. A student answering a Level 1 item either knows the answer or does not; that is, the answer does not need to be figured out or solved.

Verbs	Teacher Role	Student Role
Locate, calculate, define, identify, list, label, match, measure, copy, memorize, repeat, report, recall, recite, recognize, state, tell, tabulate, use rules, answer who, what, when, where, why, how	Questions to direct focus of attention, shows, tells, demonstrates, provides examples, explains, leads, breaks down, defines	Recognizes, responds, remembers, memorizes, restates, absorbs, describes, demonstrates, follows directions, applies routine processes, definitions, and procedures

Possible Products

- Fill-in-the-blank tasks
- Recite-math facts, poems, etc.
- Plot/locate points on a graph
- Edit sentences
- Identify/write sentence types
- Highlight key words
- Bookmark websites
- Use key word search
- Use dictionary, thesaurus
- Follow steps/directions (e.g., recipe, long division, make model)
- Explain, demonstrate
- Show & Tell
- Locate or recall quotes
- Document /cite sources
- Brainstorm related ideas
- Represent math relationships in words, pictures, or symbols
- Write complete sentences
- Identify parts of speech
- Label or locate parts in diagram
- List related parts or kinds (e.g., triangles)
- Vocabulary definitions-look up, recall, use in sentences
- Calculate, compute
- Measure, record data
- Reproduce map or diagram
- Use map key to locate information
- Oral reading fluency
- Decoding words
- Use formulas
- Evaluate expressions

Level 2: Skill/Concept

Level 2 includes the engagement of mental processing beyond recalling, reproducing, or locating an answer. This level generally requires students to compare or differentiate among people, places, events, objects, text types, etc.; apply multiple concepts when responding; classify or sort items into meaningful categories; describe or explain relationships such as cause and effect or character relationships; and provide and explain examples and non-examples. A Level 2 "describe or explain" task requires students to go beyond a basic description or definition to predict a possible result or explain "why" something might happen. The learner makes use of information provided in context to determine intended word meanings, which tools or approach is appropriate to find a solution (e.g., in a math word problem), or which characteristics to pay attention to when making observations.

At this level, students are asked to transform/process target knowledge before responding. Example mental processes that often denote this particular level include: summarize, estimate, organize, classify, extend, and make basic inferences.

Verbs	Teacher Role	Student Role
Infer, categorize, organize and display, compare-contrast, modify, predict, interpret, distinguish, estimate, extend patterns, interpret, use context clues, make observations, summarize, translate from table to graph, classify, show cause/effect, relate, edit for clarity	Questions to differentiate, infer, or check conceptual understanding, models, organizes/reorganizes, explores possible options or connections, provides examples and non-examples	Solves routine problems/tasks involving multiple decision points and concepts, constructs models to show relationships, demonstrates use of conceptual knowledge, compiles and organizes, illustrates/explains with examples or models, examines

Possible Products

- Captioned Photos Summary
- Time-line
- Demonstration
- Presentation Interview
- Diary entry
- Graphic organizer
- Reverse-Engineering
- Cracking Codes Outline
- Relationship Mind Map
- Blog Commenting
- Survey development
- Spreadsheet
- Science logs

Potential Activities

- Sequence a key chain of events and supporting details using a time-line, cartoon strip, outline or flow chart
- Write a summary /informational report or develop an outline of central ideas and supporting details
- Develop a concept map or diagram showing a process or describing relationships about a topic of study
- Explain a series of steps used to find a solution
- Construct a model to demonstrate how it looks or works
- Make a diorama to illustrate/explain an event
- Write a diary/blog entry for a character or historical figure
- Make a captioned scrapbook or photo essay about the area of study
- Make a topographic map using data provided/data collected
- Make a puzzle or game about the topic
- Explain the meaning of a concept using words, objects, and/or visuals
- Demonstrate how to perform a particular task
- Complete complex recognition tasks that involve recognizing concepts and processes that may vary in how they "appear"
- Complex calculation tasks involving decision point s (e.g., standard deviation)
- Identify appropriate strategies or sources for conducting research projects that involve locating, collecting, organizing and displaying, and summarizing information
- Create a questionnaire or survey to answer a question
- Conduct measurement or observational tasks that involve organizing the data collected into basic presentation forms such as a table, graph, Venn diagram, etc.
- Participate in a simulation in order to understand and describe differing perspectives

Potential Questions

How or why would you use...?
What examples/non-examples would help to...?
How would you organize_ to show...?
How could you show your understanding of... ?
What approach/tools would you use to...?
How would you apply what you learned to develop... ?
What other way could you solve/find out...?
What is your prediction…and why?
How would you organize these facts/observations?
If you changed these elements … what would/might happen?
What facts are relevant to show...?
What questions would you ask in an interview /survey about ...?
What question is being asked in this problem?

ELA, History & Social Studies Alignment to Bloom's Taxonomy (source: Hess ELA-SS CRM)

Revised Bloom's Taxonomy	Webb's DOK Level 2 | Skills & Concepts
REMEMBER Retrieve knowledge from long-term memory, recognize, recall, locate, identify	Not Applica
UNDERSTAND Construct meaning, clarify, paraphrase, represent, translate, illustrate, give examples, classify, categorize, summarize, generalize, infer a logical conclusion, predict, compare/contrast, match like ideas, explain, construct models	▪ Specify, explain, show relationships, explain why, cause-effect ▪ Give non-examples/examples ▪ Summarize results, concepts, ideas in one text or one data set ▪ Make basic inferences or logical predictions from data or texts ▪ Identify main ideas, accurate generalizations of texts or issues ▪ Locate information to support explicit-implicit central ideas
APPLY Carry out or use a procedure in a given situation, carry out (apply) to a familiar task, or use (apply) to an unfamiliar task	▪ Use context to identify the meaning of words/phrases ▪ Obtain and interpret information using text features ▪ Develop a text that may be limited to one paragraph ▪ Apply simple organizational structures (paragraph, sentence types) in writing
ANALYZE Break into constituent parts, determine how parts relate, differentiate between relevant-irrelevant, distinguish, focus, select, organize, outline, find coherence, deconstruct (e.g. for bias or point of view)	▪ Categorize/compare library elements, terms, facts/details, events ▪ Identify use of literary devices ▪ Analyze format, organization & internal text structure (e.g., signal words, transitions, semantic cues) of different texts ▪ Distinguish relevant-irrelevant information, fact/opinion ▪ Identify characteristic text features; distinguish between texts, genres
EVALUATE Make judgments based on criteria, check, detect inconsistencies, or fallacies, judge, critique	Not Applicable
CREATE Reorganize elements into new patterns/structures, generate, hypothesize, design, plan, produce	▪ Generate conjectures or hypotheses based on observations or prior knowledge and experience

Math & Science Alignment to Bloom's Taxonomy (source: Hess Math-Science CRM)

Revised Bloom's Taxonomy	Webb's DOK Level 2 | Skills & Concepts
REMEMBER Retrieve knowledge from long-term memory, recognize, recall, locate, identify	Not Applicable
UNDERSTAND Construct meaning, clarify, paraphrase, represent, translate, illustrate, give examples, classify, categorize, summarize, generalize, infer a logical conclusion (such as from examples given), predict, compare/contrast, match like ideas, explain, construct models	▪ Specify and explain relationships (e.g., non-examples/examples, cause-effect) ▪ Make and record observations ▪ Explain steps followed ▪ Summarize results or concepts ▪ Make basic inferences or logical predictions from data/observations ▪ Use models (e.g., diagrams to represent or explain mathematical concepts) ▪ Make and explain estimates
APPLY Carry out or use a procedure in a given situation, carry out (apply to a familiar task), or use (apply) to an unfamiliar task	▪ Select a procedure according to criteria and perform it ▪ Solve routine problem applying multiple concepts or decision points ▪ Retrieve information from a table, graph, or figure and use it to solve a problem requiring multiple steps ▪ Translate between tables, graphs, words, and symbolic notations (e.g., graph data from a table) ▪ Construct models given criteria
ANALYZE Break into constituent parts, determine how parts relate, differentiate between relevant-irrelevant, distinguish, focus, select, organize, outline, find coherence, deconstruct	▪ Categorize, classify materials, data, figures based on characteristics ▪ Organize or order data ▪ Compare/contrast figures or data ▪ Select appropriate graph and organize & display data ▪ Interpret data from a simple graph ▪ Extend a pattern
EVALUATE Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique	Not Applicable
CREATE Reorganize elements into new patterns/structures, generate, hypothesize, design, plan, construct, produce	▪ Generate conjectures or hypotheses based on observations or prior knowledge and experience

Level 3: Strategic Thinking & Reasoning

Tasks and classroom discourse falling into this category demand the use of planning, reasoning, and higher order thinking processes, such as analysis and evaluation, to solve real-world problems or explore questions with multiple possible outcomes. Stating one's reasoning and providing relevant supporting evidence are key markers of DOK 3 tasks. The expectation established for tasks at this level require an in-depth integration of conceptual knowledge and multiple skills to reach a solution or produce a final product. DOK 3 tasks and classroom discourse focus on in-depth understanding of one text, one data set, one investigation, or one key source, whereas DOK 4 tasks expand the breadth of the task using multiple texts or sources, or multiple concepts/disciplines to reach a solution or create a final product.

Verbs	Teacher Role	Student Role
Critique, appraise, revise for meaning, assess, investigate, cite evidence, test hypothesis, develop a logical argument, use concepts to solve non-routine problems, explain phenomena in terms of concepts, draw conclusions based on data	Questions to probe reasoning and underlying thinking, asks open-ended questions, acts as resource and coach, provides criteria and principles for making judgments and supporting claims, encourages multiple approaches and solutions; determines when/where (text/concept) depth and exploration is most appropriate	Uncovers and selects relevant and credible supporting evidence for analyses, critiques, debates, claims and judgments; plans, initiates questions, disputes, argues, tests ideas/solutions, sustains inquiry into topics or deeper problems, applies to the real world

Possible Products

- Complex Graph
- Set up a database
- Conduct or critique a designed investigation
- Video cast or podcast
- Analyze survey results
- Debate from a given perspective
- Develop storyboard for film or cartoon animation
- Multi-paragraph essay or short story
- Literary critique
- Play, book, music, or movie review
- Informational report with several subtopics
- Fact-based argument (Is this criticism supported by the historical facts?)
- Create a Wiki or website

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