

Webb's Depth of Knowledge Guide

Career and Technical Education Definitions

2009

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OVERVIEW

Webb (1997) developed a process and criteria for systematically analyzing the alignment between standards and standardized assessments. Since then the process and criteria have demonstrated application to reviewing curricular alignment as well. This body of work offers the Depth of Knowledge (DOK) model employed to analyze the cognitive expectation demanded by standards, curricular activities and assessment tasks (Webb, 1997). The model is based upon the assumption that curricular elements may all be categorized based upon the cognitive demands required to produce an acceptable response. Each grouping of tasks reflects a different level of cognitive expectation, or depth of knowledge, required to complete the task. It should be noted that the term knowledge, as it is used here, is intended to broadly encompass all forms of knowledge (i.e. procedural, declarative, etc.). The following table reflects an adapted version of the model.

DOK Level	Title of Level
1	Recall and Reproduction
2	Skills and Concepts
3	Short-term Strategic Thinking
4	Extended Thinking

DOK level are assigned to each course objective the following served as general guidelines for developers:

- The DOK level assigned should reflect the level of work students are most commonly required to perform in order for the response to be deemed acceptable.
- The DOK level should reflect the complexity of the cognitive processes demanded by the task outlined by the objective, rather than its difficulty. Ultimately the DOK level describes the kind of thinking required by a task, not whether or not the task is “difficult”.
- If there is a question regarding which of two levels a statement addresses, such as Level 1 or Level 2, or Level 2 or Level 3, it is appropriate to select the higher of the two levels.
- The DOK level should be assigned based upon the cognitive demands required by the central performance described in the objective.
- **The objective’s central verb(s) alone is/are not sufficient information to assign a DOK level. Developers must also consider the complexity of the task and/or information, conventional levels of prior knowledge for students at the grade level, and the mental processes used to satisfy the requirements set forth in the objective.**

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 particular level usually involves working with facts, terms and/or properties of objects. It may also involve use of simple procedures and/or formulas. There is little transformation or extended processing of the target knowledge required by the tasks that fall into this category. Key words that often denote this particular level include: list, identify and define. 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.”

POSSIBLE PRODUCTS

Quiz	List	Collection	Podcast	Social bookmarking
Definition	Workbook	Explanation	Categorizing/Tagging	Searching
Fact	Reproduction	Show and Tell	Commenting	Googling
Worksheet	Vocabulary Quiz	Outline	Bulleting	
Test	Recitation	Blog	Highlighting	
Label	Example	Wiki	Social networking	

ROLES

TEACHER

Directs
Shows
Questions
Demonstrates
Compares
Examines

Tells
Examines
Evaluates
Listens
Contrasts

STUDENT

Responds
Remembers
Memorizes
Explains
Restates
Interprets

Absorbs
Recognizes
Describes
Translates
Demonstrates

POTENTIAL ACTIVITIES

- Develop a concept map showing a process or describing a topic.
- Make a timeline
- Write a list of keywords you know about...
- Make a chart showing...
- Recite a fact related to...
- Write in your own words...
- Cut out, or draw a picture that illustrates an event, process, or story.
- Report or present to the class.
- Make a cartoon strip showing the sequence of an event, process, or story.
- Write and perform...
- Write a brief outline and explain the event, process, or story.
- Write a summary report of the event
- Prepare a flow chart that illustrates the sequence of events.
- Paraphrase a chapter in the book
- Retell in your own words
- Outline the main points

- Recall, restate, remember, or recognize a fact, term, or property (Recognizing, listing, describing, identifying, retrieving, naming, locating, finding)
- Using basic calculation tasks involving only one step (i.e. addition, subtraction, etc), complete the following...
- Locate or retrieve information in verbatim form.
- Straight-forward recognition tasks related to identifying features, objects and/or steps that don't vary greatly in form (i.e. recognizing features of basic tools).
- Writing tasks that involve applying a standard set of conventions and or criteria that should eventually be automated (i.e. using punctuation, spelling, etc)
- Basic measurement tasks that involve one step (i.e. using a ruler to measure length)
- Use this simple formula where at least one of the unknowns are provided to...
- Locating information in maps, charts, tables, graphs, and drawings

Level 2 – Working with Skills & Concepts

Level 2 includes the engagement of some mental processing beyond recalling or reproducing a response. This level generally requires students to contrast or compare people, places, events and concepts; convert information from one form to another; classify or sort items into meaningful categories ; describe or explain issues and problems, patterns , cause and effect, significance or impact, relationships, points of view or processes. A Level 2 “describe or explain” would require students to go beyond a description or explanation of recalled information to describe or explain a result or “how” or “why.” The learner should make use of information in a context different from the one in which it was learned.

Elements found in a curriculum that fall in this category involve working with or applying skills and/or concepts to tasks related to the field of study in a laboratory setting. The subject matter content at this particular level usually involves working with a set of principles, categories, heuristics, and protocols. 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, and infer.

POSSIBLE PRODUCTS

Photograph	Presentation	Reverse-Engineering	Blog Commenting
Illustration	Interview	Cracking Codes	Blog Reflecting
Simulation	Performance	Linking	Moderating
Sculpture	Dairy	Mashing	Testing (Alpha/Beta)
Demonstration	Journal	Relationship Mind Maps	Validating

ROLES

TEACHER

Shows	Facilitates
Observes	Evaluates
Organizes	Questions

STUDENT

Solves problems	Demonstrates use of knowledge
Calculates	Compiles
Completes	Illustrates
Constructs	

POTENTIAL ACTIVITIES

- Classify a series of steps
- Construct a model to demonstrate how it looks or works
- Practices a play and perform in class
- Make a diorama to illustrate an event
- Write a diary/blog entry
- Make a scrapbook about the area of study
- Make a topographic map
- Make up puzzle or game about the topic
- Write an explanation about this topic for others
- Make a model...
- Routine application tasks (i.e. applying a simple set of rules or protocols to a laboratory situation the same way each time)
- Explaining the meaning of a concept and/or explaining how to perform a particular task
- Stating relationships among a number of concepts and or principles

- More complex recognition tasks that involve recognizing concepts and processes that may vary in how they “appear”
- More complex calculation tasks (i.e. multi-step calculations such as standard deviation)
- Research projects and writing activities that involve locating, collecting, organizing and displaying information (i.e. writing a report with the purpose to inform; meeting all steps of the writing process)
- Measurement tasks that occur over a period of time and involve aggregating/organizing the data collected in to basic presentation forms such as a simple table or graph

LEVEL 3 – SHORT-TERM STRATEGIC THINKING

Items falling into this category demand a short-term use of higher order thinking processes, such as analysis and evaluation, to solve real-world problems with predictable outcomes. Stating one’s reasoning is a key marker of tasks that fall into this particular category. The expectation established for tasks at this level tends to require coordination of knowledge and skill from multiple subject-matter areas to carry out processes and reach a solution in a project-based setting. Key processes that often denote this particular level include: analyze, explain and support with evidence, generalize, and create.

POSSIBLE PRODUCTS

Graph	Survey	Debate	Conclusion	Podcast
Spreadsheet	Database	Panel	Program	Publishing
Checklist	Mobile	Report	Film	Wiki-ing
Chart	Abstract	Evaluating	Animation	
Outline	Report	Investigation	Video cast	

ROLES

TEACHER

Probes
Observes
Acts as a resource
Organizes
Clarifies
Guides

Guides
Evaluates
Questions
Dissects
Accepts

STUDENT

Discusses
Debates
Examines
Judges
Assesses
Justifies

Uncovers
Thinks deeply
Questions
Disputes
Decides

Argues
Tests
Calculates
Compares
Selects

POTENTIAL ACTIVITIES

- Use a Venn Diagram that shows how two topics are the same and different
- Design a questionnaire to gather information
- Survey classmates/industry members to find out what they think about a particular topics
- Make a flow chart to show the critical stages.
- Classify the actions of the characters in book
- Prepare a report about an area of study
- Conduct an investigation to produce information to support a view
- Write a letter to the editor after evaluation product
- Prepare and conduct a debate
- Prepare a list of criteria to judge
- Write a persuasive speech arguing for/against...
- Make a booklet about five rules you see as important. Convince others.
- Form a panel to discuss viewpoints on...
- Write a letter to... advertising on changes needed.
- Prepare a case to present your view about

- Short-term tasks and projects placing a strong emphasis on transferring knowledge to solve predictable problems
- Explaining and/or working with abstract terms and concepts
- Recognition tasks when the environment observed is real-world and often contains extraneous information which must be sorted through
- Complex calculation problems presented that draw upon multiple processes
- Writing and or explaining tasks that require altering a message to “fit” an audience
- Creating graphs, tables and charts where students must reason through and organize the information with instructor prompts
- Identifying a research question and/or designing investigations to answer a question
- Tasks that involve proposing solutions or making predictions

Level 4 – Extended Strategic Thinking

Curricular elements assigned to this level demand extended use of higher order thinking processes such as synthesis, reflection, assessment and adjustment of plans over time. Students are engaged in conducting investigations to solve real-world problems with unpredictable outcomes. Employing and sustaining strategic thinking processes over a longer period of time to solve the problem is a key feature of curricular objectives that are assigned to this level. Key strategic thinking processes that denote this particular level include: synthesize, reflect, conduct, and manage.

POSSIBLE PRODUCTS

Film	Project	New Game	Newspaper
Story	Plan	Song	Media Product

ROLES

TEACHER

Facilitates
Reflects
Evaluates

Extends
Analyses

STUDENT

Designs
Takes risks
Proposes

Formulates
Modifies

Plans
Creates

POTENTIAL ACTIVITIES

- Applying information to solve ill-defined problems in novel situations
- Tasks that require a number of cognitive and physical skills in order to complete
- Writing and/or research tasks that involve formulating and testing hypotheses over time
- Tasks that require students to make multiple strategic and procedural decisions as they are presented with new information throughout the course of the event
- Tasks that require perspective taking and collaboration with a group of individuals
- Creating graphs, tables, and charts where students must reason through and organize the information without instructor prompts
- Writing tasks that have a strong emphasis on persuasion
- Devise a way to...
- Develop a menu for a new restaurant using a variety of healthy foods
- Sell an idea
- Write a jingle to advertise a new product
- Conduct an internship in industry where students are faced with real-world, unpredictable problems