

Depth of Knowledge (DOK)

Kentucky Department of Education

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

Strategic Thinking: Level 3

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

Extended Thinking: Level 4

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.

<i>Task</i>	<i>Thinking</i>
Collecting data samples over several months	Recall
Organizing the data in a chart	Skills/ concepts
Using this chart to make and justify predictions	Strategic Thinking
Developing a generalized model from this data and applying it to a new situation	Extending Thinking

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

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

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.