

Cognitive Complexity/Depth of Knowledge Rating

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Overview

Florida’s standards for Mathematics and English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects presents Florida with an opportunity to revise its Depth of Knowledge (DOK) Model of Cognitive Complexity. As a structure for identifying the alignment of the cognitive demands that standards and corresponding assessments place on learners, Florida’s original three-level model of low, moderate, and high DOK has served the state well since its implementation in 2004. Although the state’s three-level model continues to be a useful framework for assessing DOK, particularly for the purposes of assessment, now make it advisable to draw finer distinctions among the levels of complexity that are called for in the text of an individual standard or instructional unit. Toward this end, Florida is adopting Webb’s four-level DOK model of content complexity as a means of classifying the cognitive demand presented by standards and curriculum. In contrast to cognitive complexity, content complexity relates specifically to the cognitive demands that can be inferred from the language of a content standard. In essence, content complexity considers factors such as prior knowledge, processing of concepts and skills, sophistication, number of parts, and application of content structure required to meet an expectation or to attain an outcome. Because of its reliance on prior knowledge, content complexity does bear some relation to grade level. Before describing the features of the state’s new four-level DOK model of content complexity in greater detail, it is important to sketch the contextual backdrop against which Florida’s current alignment efforts are unfolding.

Since the adoption of the Sunshine State Standards (SSS) and the Florida Comprehensive Assessment Test (FCAT) over the latter half of the nineties, Florida has striven to incorporate the best available research in its continuing effort to align standards and assessments (FDOE, 2008). From the early use of Bloom’s taxonomy as the basis for identifying FCAT item difficulty, to the adoption of a modified Webb DOK model of content complexity for aligning standards and assessments, the state has worked to develop a comprehensive K-12 standards and assessment system. In contrast to item difficulty, which is based upon the analysis of student responses to specific assessment items, content complexity ratings reflect the level of cognitive demand that standards and corresponding instruction impose upon the student. The evolution of Florida’s standards and assessment alignment program from one that is based upon student ability, to one that is focused upon the scale of cognitive demand associated with standards and instruction, is illustrative of the state’s ongoing effort to support the development of a curriculum and assessment system that exemplifies the qualities of focus, coherence, and rigor embodied by Florida’s standards.

Table 1. Comparison of Webb’s DOK Model with Florida’s

	Florida’s Original DOK Levels
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Webb's DOK Levels	
Level 1: Recall	Low: Recall
Level 2: Basic Application of Skills & Concepts	Moderate: Basic Application of Skills & Concepts
Level 3: Strategic Thinking & Complex Reasoning	High: Strategic Thinking & Complex Reasoning
Level 4: Extended Thinking & Complex Reasoning	

Florida's original three-level DOK model of cognitive complexity was adapted from the four-level DOK model described by Dr. Norman Webb (2005) and shown in the left-hand column of Table 1. As shown in the right-hand column of the table, Webb's Levels 1 and 2 were represented in Florida's adaptation of Webb's DOK model as low and moderate respectively. DOK Levels 3 and 4 were collapsed into a single, "high" DOK level. Despite the structural difference between the two DOK models described in Table 1, Florida's model was consistent with Webb's in its recognition that Levels 3 and 4 both reflected the application of strategic thinking and complex reasoning. The major difference between Levels 3 and 4 is that DOK Level 4 may represent either the application and synthesis of Level 3 knowledge and skills over an extended time period, or the complex analysis of multiple concepts, issues, perspectives, or cultures, and/or any historical trends relevant to them. In either case, extended time is required for students to demonstrate Level 4 performance.

Because the DOK model of content complexity was designed primarily as a framework for aligning content standards and assessments, it is important to distinguish between the DOK rating for a given standard and the possible DOK ratings for assessment items designed to address the standard. The DOK level for an individual content standard is intended to represent the typical performance level of cognitive complexity that a learning activity or assessment item associated with that standard might entail. This is particularly important for assessment purposes, since 50% or more of assessment items associated with a given standard should meet or exceed the DOK level of the standard. For example, a grade 5 standard for mathematics states:

Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result $2/5 + 1/2 = 3/7$ by observing that $3/7 < 1/2$.

While a valid argument could be made that the "assess the reasonableness of answers" phrase in the standard calls upon the student to develop a mathematical argument – a DOK Level 3 skill – the typical expectation for this standard would be for students to use benchmark numbers or general reasoning to assess reasonableness. Since these strategies encompass DOK Level 2, then a Level 2 rating is more appropriate for this standard. This becomes very important for assessment purposes when items must be devised so that half or more of them meet or exceed the DOK Level of the standard.

New assessments incorporate Level 4 tasks makes it feasible for the state to incorporate Webb's four-level DOK model of content complexity. This change will reinforce the state's commitment to the development of curriculum and assessment frameworks that are aligned and fully support college and career-readiness for all of Florida's students.

What follows are brief descriptions of each of Webb's four DOK levels as they apply to the five content areas of English language arts, mathematics, science, social studies, and health education.

Adapted From:

Florida Department of Education, (2008). Cognitive complexity classification of FCAT test items. Retrieved on April 22, 2012 from: http://fcat.fldoe.org/pdf/cog_complexity-fv31.pdf

Webb, N.L., 2002, *Depth-of-Knowledge Levels for Four Content Areas*, University of Wisconsin Center for Educational Research.

Written in collaboration with Dr. Norman L. Webb

Levels of Content Complexity for English Language Arts

Reading

Level 1 (Recall) items or tasks require students to recite facts or to use simple skills or abilities. Oral reading that does not include analysis of the text or verbatim repetition of a text are exemplary of DOK Level 1 reading tasks. Level 1 standards or test items require only a surface understanding of text presented and often consist of verbatim recall from text or simple understanding of a single word or phrase.

Some examples that represent but do not constitute all of Level 1 performance are:

- Recognize and name end punctuation.
- Use a dictionary to find the meaning of words.
- Identify figurative language in a reading passage..
- Recognize the correct order of events from a text.
- Quote accurately from a text.

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Level 2 (Basic Application of Concepts & Skills) includes the engagement of some mental processing beyond recalling a response; it requires both comprehension by attending to contextual clues and subsequent processing of text or portions of text. Inter-sentence analysis of inference is required. Some important concepts are covered but not in a complex way. Literal main ideas are stressed. A Level 2 thinking may require students to apply some of the skills and concepts that are covered in Level 1.

Some examples that represent but do not constitute all of Level 2 performance are:

- Use context cues to identify the meaning of unfamiliar words.
- Provide an objective summary of the text.

- Predict a logical outcome based on information in a reading selection.
- Identify and summarize the major events in a narrative.
- Determine the main idea of a text.
- Determine how details support the main idea.
- Recognize elements of a plot.
- Make connections between the text of a story or drama and a visual or oral presentation of the text.

Level 3 (Strategic Thinking & Complex Reasoning) tasks call upon students to go beyond the text; however, they are still required to show understanding of the ideas in the text. Students may be encouraged to explain, generalize, or connect ideas. Standards and items at Level 3 involve reasoning and planning. Students must be able to support their thinking. Level 3 may involve abstract theme identification, inference across an entire passage, or students' application of prior knowledge. Level 3 may also involve more than superficial connections between texts.

Some examples that represent but do not constitute all of Level 3 performance are:

- Determine the author's purpose and describe how it affects the interpretation of a reading selection.
- Identify causal relationships in a text.
- Assess the extent to which the reasoning and evidence in a text support the author's claims.
- Compare and contrast the treatment of similar themes and topics (e.g., opposition of good and evil).
- Trace and evaluate the argument and specific claims in a text.
- Summarize information from multiple sources to address a specific topic.
- Analyze and describe the characteristics of various types of literature.
- Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

Level 4 (Extended Thinking & Complex Reasoning) standards or assessment items consist of extended activities, with extended time provided for their completion. The extended time period is not a distinguishing factor if the required work is only repetitive. In other words, any combination of levels 1 - 3 skills called upon by an extended time period task will not rise to a level 4 rating unless the task also encompasses significant conceptual understanding and higher-order thinking. High levels of complexity through analysis and synthesis characterize both levels 3 and 4. What distinguishes the two is that a level 4 standard or test item will entail a significant effort over time, multiple resources, and documents. At level 4 students are expected to take information from at least one passage and are asked to apply this information to a new task. They may also be asked to develop hypotheses and perform complex analyses of the connections among texts.

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Some examples that represent but do not constitute all of Level 4 performance are:

- Analyze and synthesize information from multiple sources.
- Examine and explain alternative perspectives across a variety of sources.
- Describe and illustrate how common themes are found across texts from different cultures.

Writing

Level 1 (Recall) requires the student to write or recite simple facts. This writing or recitation does not include complex synthesis or analysis but is restricted to basic ideas. The students are engaged in listing ideas or words as in a brainstorming activity prior to written composition, are engaged in a simple spelling or vocabulary assessment or are asked to write simple sentences. Students are expected to write and speak using Standard English conventions. This includes using appropriate grammar, punctuation, capitalization and spelling.

Some examples that represent but do not constitute all of Level 1 performance are:

- Use punctuation marks correctly.
- Identify Standard English grammatical structures and refer to resources for correction.
- Recall information from experiences or gather information from provided sources to answer a question.
- Use correct grammar, punctuation, capitalization, and spelling to construct simple sentences.

Level 2 (Basic Application of Concepts & Skills) tasks require some mental processing. At this level students are engaged in tasks such as first draft writing for a limited number of purposes and audiences. At Level 2 students are beginning to connect ideas using a simple organizational structure. For example, students may be engaged in note-taking, outlining or simple summaries. Text may be limited to one paragraph. Students demonstrate a basic understanding and appropriate use of such reference materials as a dictionary, thesaurus, or web site.

Some examples that represent but do not constitute all of Level 2 performance are:

- Construct compound sentences.
- Use simple organizational strategies to structure written work.
- Write summaries that contain the main idea of the reading selection and pertinent details.
- Outline a text, illustrating its key ideas.
- Use correct grammar, punctuation, capitalization, and spelling to produce a paragraph about an experience or activity.

Level 3 (Strategic Thinking & Complex Reasoning) tasks require higher-level mental processing. Students are engaged in developing compositions that include multiple paragraphs. These compositions may include complex sentence structure and may demonstrate some synthesis and analysis. Students show awareness of their audience and purpose through focus, organization and the use of appropriate compositional elements. The use of appropriate compositional elements includes such things as addressing chronological order in a narrative or including supporting facts and details in an informational report. At this stage students are engaged in editing and revising to improve the quality of the composition.

Some examples that represent but do not constitute all of Level 3 performance are:

- Support ideas with details and examples.
- Use transitional words or sentences to tie ideas together in an essay or story.
- Edit writing to produce a logical progression of ideas associated with a theme.

- Write arguments to support claims with clear reasons and relevant evidence.
- Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

Level 4 (Extended Thinking & Complex Reasoning) tasks may incorporate a multi-paragraph composition that demonstrates synthesis and analysis of complex ideas or themes. Such tasks will require extended time and effort with evidence of a deep awareness of purpose and audience. For example, informational papers include hypotheses and supporting evidence. Students are expected to create compositions that demonstrate a distinct voice and that stimulate the reader or listener to consider new perspectives on the addressed ideas and themes.

Some examples that represent but do not constitute all of Level 4 performance are:

- Write an analysis of two selections, identifying the common theme and generating a purpose that is appropriate for both.
- Use voice appropriate to the purpose and audience of an essay.
- Conduct research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.
- Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
- Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

Levels of Content Complexity for Mathematics

Level 1 (Recall) includes the recall of information such as a fact, definition, term, or a simple procedure, as well as performing a simple algorithm or applying a formula. That is, in mathematics a one-step, well-defined, or straight algorithmic procedure should be included at this lowest level.

Some examples that represent but do not constitute all of Level 1 performance are:

- Count to 100 by ones and by tens.
- Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$).
- Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation "add 8 and 7, then multiply by 2" as $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product.
- Enter measurement data into a data table.
- Identify the variables indicated in a two-dimensional graph.

Level 2 (Basic Application of Concepts & Skills) includes the engagement of some mental processing beyond a habitual response. A Level 2 standard or assessment item requires students to make some decisions as to how to approach the problem or activity, whereas Level 1 requires students to demonstrate a

rote response, perform a well-known algorithm, follow a set procedure (like a recipe), or perform a clearly defined series of steps. For example, to compare data requires first identifying characteristics of the objects or phenomenon and then grouping or ordering the objects. Interpreting information from a simple graph, requiring reading information from the graph, also is a Level 2. Interpreting information from a complex graph that requires some decisions on what features of the graph need to be considered and how information from the graph can be aggregated is a Level 3. Caution is warranted in interpreting Level 2 as only skills because some reviewers will interpret skills very narrowly, as primarily numerical skills, and such interpretation excludes from this level other skills such as visualization skills and probability skills, which may be more complex simply because they are less common and require more mental processing.

Some examples that represent but do not constitute all of Level 2 performance are:

- Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
- Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end.
- Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l)
- Apply properties of operations as strategies to add and subtract rational numbers.
- Measure and record data and produce graphs of relevant variables.
- Graph proportional relationships, interpreting the unit rate as the slope of the graph.

Level 3 (Strategic Thinking & Complex Reasoning) requires reasoning, planning, using evidence, and a higher level of thinking than the previous two levels. In most instances, requiring students to explain their thinking is a Level 3. Activities that require students to make conjectures are also at this level. The cognitive demands at Level 3 are complex and abstract. The complexity does not result from the fact that there are multiple answers, a possibility for both Levels 1 and 2, but because the task requires more demanding reasoning. However, an activity that has more than one possible answer and requires students to justify the response they give would most likely be a Level 3.

Some examples that represent but do not constitute all of Level 3 performance are:

- Explain why addition and subtraction strategies work, using place value and the properties of operations.
- Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
- Given a real-world situation, formulate a problem.
- Organize, represent, and interpret data obtained through experiments or observations.
- Formulate a mathematical model to describe a complex phenomenon
- Justify a solution to a problem.
- Analyze a deductive argument.

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Level 4 (Extended Thinking & Complex Reasoning) in mathematics involves the application of level three processes and skills over an extended period. This is likely to incorporate demands from other content areas (e.g., English language arts, science), in the development and support of mathematical arguments that describe some real-world phenomenon or situation.

Some examples that represent but do not constitute all of Level 4 performance are:

- Derive a mathematical model to explain a complex phenomenon or make a prediction.
- Complete a project requiring the formulation of questions, devising a plan, collecting data, analyzing the data, and preparing a written report describing the justification of the conclusions reached.

Levels of Content Complexity for Science

Interpreting and assigning Depth of Knowledge levels to objectives within science standards and assessment items is an essential requirement of alignment analysis. Please note that, in science, "knowledge" can refer to content knowledge, knowledge of science processes, and nature of science.

Level 1 (Recall) is the recall of information such as a fact, definition, or term, as well as performing a simple science process or procedure. Level 1 only requires students to demonstrate a rote response, use a well-known formula, follow a set well-defined procedure (like a recipe), or perform a clearly defined series of steps. Standards that lend themselves to simple word problems that can be directly translated into and solved by a formula are considered Level 1.

Some examples that represent but do not constitute all of Level 1 performance are:

- Recall or recognize a fact, term, or property.
- Represent in words or diagrams a scientific concept or relationship.
- Provide or recognize a standard scientific representation for simple phenomena.
- Perform a routine procedure such as measuring length.
- Identify familiar forces (e.g. pushes, pulls, gravitation, friction, etc.)
- Identify objects and materials as solids, liquids, or gases.

Level 2 (Basic Application of Concepts & Skills) includes the engagement of some mental processing beyond recalling or reproducing a response. The content knowledge or process involved is more complex than in Level 1. Level 2 requires that students make some decisions as to how to approach the question or problem. Level 2 activities include making observations and collecting data; classifying, organizing, and comparing data; representing and displaying data in tables, graphs, and charts.

Some action verbs, such as "explain," "describe," or "interpret," may be classified at different DOK levels, depending on the complexity of the action. For example, interpreting information from a simple graph, requiring reading information from the graph, is at Level 2. An activity that requires interpretation from a complex graph, such as making decisions regarding features of the graph that should be considered and how information from the graph can be aggregated, is at Level 3.

Some examples that represent, but do not constitute all of Level 2 performance, are:

- Specify and explain the relationship among facts, terms, properties, and variables.
- Identify variables, including controls, in simple experiments.
- Distinguish between experiments and systematic observations.

- Describe and explain examples and non-examples of science concepts.
- Select a procedure according to specified criteria and perform it.
- Formulate a routine problem given data and conditions.
- Organize, represent, and interpret data.

Level 3 (Strategic Thinking & Complex Reasoning) requires reasoning, planning, using evidence, and a higher level of thinking than the previous two levels. The cognitive demands at Level 3 are complex and abstract. The complexity does not result only from the fact that there could be multiple answers, a possibility for both Levels 1 and 2, but because the multi-step task requires more demanding reasoning. In most instances, requiring students to explain their thinking is at Level 3; requiring a very simple explanation or a word or two should be at Level 2. An activity that has more than one possible answer and requires students to justify the response they give would most likely be a Level 3. Experimental designs in Level 3 typically involve more than one dependent variable. Other Level 3 activities include drawing conclusions from observations; citing evidence and developing a logical argument for concepts; explaining phenomena in terms of concepts; and using concepts to solve non-routine problems.

Some examples that represent, but do not constitute all of Level 3 performance, are:

- Identify research questions and design investigations for a scientific problem.
- Design and execute an experiment or systematic observation to test a hypothesis or research question.
- Develop a scientific model for a complex situation.
- Form conclusions from experimental data.
- Cite evidence that living systems follow the Laws of Conservation of Mass and Energy.
- Explain how political, social, and economic concerns can affect science, and vice versa.
- Create a conceptual or mathematical model to explain the key elements of a scientific theory or concept.
- Explain the physical properties of the Sun and its dynamic nature and connect them to conditions and events on Earth.
- Analyze past, present, and potential future consequences to the environment resulting from various energy production technologies.

Level 4 (Extended Thinking & Complex Reasoning) standards and assessment items have the same high cognitive demands as Level 3 with the additional requirement that students work over an extended period of time or with extended effort. Students are required to make several connections—relating ideas within the content area or among content areas—and have to select or devise one approach among many alternatives for how the situation or problem can be solved. Standards, goals, and objectives can be stated in such a way as to expect students to perform extended thinking. Many, but not all, performance assessments and open-ended assessment activities requiring significant thought will be level 4.

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Level 4 requires complex reasoning, and an extended period of time either for a science investigation relevant to a standard, or for carrying out the complex analysis and synthesis required of an assessment item. For example, a standard or performance task that calls for the student to use evidence from multiple fields of scientific inquiry in supporting a scientific claim might represent a level 4, depending upon the complexity of the analysis. In any event, an activity or performance task associated with a level 4 standard will require an extended period of time for a student to accomplish. It is important to reiterate that the extended time period is not a distinguishing factor if the required work is only repetitive and does not require the application of significant conceptual understanding and higher-order thinking. For example, an activity that calls upon a student to measure the water temperature from a river each day for a month before constructing a graph would be classified as a level 2. On the other hand, an activity that calls upon a student to conduct a complex river study that requires taking into consideration a number of variables would be a level 4.

Some examples that represent but do not constitute all of a Level 4 performance are:

- Based on provided data from a complex experiment that is novel to the student, deduce the fundamental relationships among several variables.
- Conduct an investigation, from specifying a problem to designing and carrying out an experiment, to analyzing its data and forming conclusions.
- Explain how a particular scientific theory (e.g., evolution, plate tectonics, atomic theory, etc.) is supported by evidence from multiple lines of inquiry.
- Produce a detailed report of a scientific experiment or systematic observation and infer conclusions based upon evidence obtained.
- Write a detailed history of the development of an important scientific concept (e.g., atomic theory, gravitation) and explain how current conceptions developed from prior ones.

Levels of Content Complexity for Social Studies

Level 1 (Recall) standards and assessment items require students to recall facts, terms, concepts, trends, generalizations and theories or to recognize or identify specific information contained in graphics. This level generally requires students to identify, list, or define. Standards or tasks at this level usually ask the student to recall who, what, when and where. Items that require students to “describe” and “explain” could be classified at Level 1 or 2 depending on what is to be described and explained. A Level 1 “describe or explain” would recall, recite or reproduce information. Items that require students to recognize or identify specific information contained in maps, charts, tables, graphs or drawings are generally level 1.

Some examples that represent but do not constitute all of Level 1 performance are:

- Recognize the importance of U.S. symbols.
- List characteristics of good citizenship.
- Describe different types of jobs in an economic system and the types of tools used.
- Identify significant individuals responsible for the development of the New England, Middle, and Southern colonies.
- Use latitude and longitude to locate places.
- Describe the role of the three branches of government in the U.S.

Level 2 (Basic Application of Concepts & Skills) 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; give an example; classify or sort items into meaningful categories; describe, interpret or explain issues and problems, patterns, reasons, 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.”

Some examples that represent but do not constitute all of Level 2 performance are:

- Distinguish between primary and secondary sources.
- Describe technological developments that shaped European exploration.

- Identify and explain significant events leading up to the American Revolution.
- Discuss the concept of Manifest Destiny.
- Explain how the three branches of government in the U.S. were designed to set up a system of checks and balances.

Level 3 (Strategic Thinking & Complex Reasoning) requires reasoning, using evidence, and a higher level of thinking than the previous two levels. Students would go beyond explaining or describing “how and why” to justifying the “how and why” through application and evidence. The cognitive demands at Level 3 are more complex and more abstract than Levels 1 or 2. Items at Level 3 include drawing conclusions; citing evidence; applying concepts to analyze new situations; using concepts to solve problems; analyzing similarities and differences in issues and problems; proposing and evaluating solutions to problems; recognizing and explaining misconceptions or making connections across time and place to explain a concept or big idea.

Some examples that represent but do not constitute all of Level 3 performance are:

- Describe the introduction, impact, and role of slavery in the colonies.
- Examine and explain the changing roles and impact of significant women during the American Revolution.
- Compare and contrast Federalist and Anti-Federalist views of government.
- Trace the development of technology and the impact of major inventions on business productivity during the early development of the United States.
- Differentiate fact from opinion, utilizing appropriate historical research and fiction/nonfiction support materials.
- Discuss the impact of westward expansion on cultural practices and migration patterns of Native American and African slave populations.

Level 4 (Extended Thinking & Complex Reasoning) standards and assessment items combine the strategic thinking of Level 3 with the addition of planning, investigating, or developing that will require an extended period of time. The extended time period is not a distinguishing factor if the required work is only repetitive and does not require applying significant conceptual understanding and higher-order thinking. At this level the cognitive demands should be high and the work should require in-depth analysis using multiple sources. Students should connect and relate ideas and concepts within the content area or among content areas through research in order to be at this highest level. The distinguishing factor for Level 4 would be evidence through a task or product that the cognitive demands have been met. A Level 4 standard or assessment item will require students to analyze and synthesize information from multiple sources, examine and explain alternative perspectives across a variety of sources, and/or describe and illustrate how common themes and concepts are found across time and place. In some Level 4 performances students will make predictions with evidence as support, develop a logical argument, or plan and develop solutions to problems.

Standards, goals, and objectives can be stated so as to expect students to perform thinking at this level. On-demand assessment tasks, extended responses, or extended responses would be classified as Level 4.

Some examples that represent but do not constitute all of Level 4 performance are:

- Using primary sources, write an analysis of the historical development of significant sociocultural and/or socioeconomic trends and developments (e.g., women's/worker's rights, race relations, religious influences).
- Produce a presentation that compares and contrasts various political systems (e.g., democracy, communism, democratic socialism, anarchy, etc.).
- Write an essay linking the significance of geological location and resources on the economic and social development of a country or region.
- Design a study of regional natural resources and assess the impact of human development and use.

Levels of Content Complexity for Health Education

Level 1 (Recall) tasks call upon students to recall facts, terms, concepts, trends, generalizations and theories or to recognize or identify specific information contained in graphics. This level generally requires students to identify, list, or define. The items at this level usually ask the student to recall who, what, when and where. Items that require students to “describe” and “explain” could be classified at Level 1 or 2 depending on what is to be described and explained. A Level 1 “describe or explain” would recall, recite or reproduce information. Items that require students to recognize or identify specific information contained in maps, charts, tables, graphs or drawings are generally Level 1.

Some examples that represent but do not constitute all of Level 1 performance are:

- Recognize that various body parts and organs work together as body systems.
- List various psychological coping strategies.
- Describe risks associated with unhealthy habits.
- List healthy behaviors that promote physical wellbeing.
- Identify major chronic diseases that impact human body systems.

Level 2 (Basic Application of Concepts & Skills) tasks include 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; give an example; classify or sort items into meaningful categories; describe, interpret or explain issues and problems, patterns, reasons, 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.”

Some examples that represent but do not constitute all of Level 2 performance are:

- Explain how certain organs work together as a human system (e.g., reproductive, cardio-vascular, etc.).
- Explain why healthy eating habits are important.
- Describe how personal behavior and choices affect the body.
- Analyze valid health information from home, school, and community.
- Categorize healthy and unhealthy alternatives to health-related issues or problems.
- Determine situations when specific professional health services or providers may be required.

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Level 3 (Strategic Thinking & Complex Reasoning) requires reasoning, using evidence, and a higher level of thinking than the previous two levels. Students go beyond explaining or describing “how and why” to justifying the “how and why” through application and evidence. The cognitive demands at Level 3 are more complex and more abstract than Levels 1 or 2. Items at Level 3 include drawing conclusions; citing evidence; applying concepts to new situations; using concepts to solve problems; analyzing similarities and differences in issues and problems; proposing and evaluating solutions to problems; recognizing and explaining misconceptions or making connections across time and place to explain a concept or big idea.

Some examples that represent but do not constitute all of Level 3 performance are:

- Evaluate the outcomes of a health-related decision.
- Evaluate the validity of health information, products, and services.
- Analyze the relationship between healthy behaviors and personal health.
- Justify a health-enhancing position on a topic and support it with accurate information.
- Analyze the interrelationship between healthy behaviors and the dimensions of health: physical, mental/emotional, social, and intellectual.
- Explain how the perceptions of norms influence healthy and unhealthy behaviors.

Level 4 (Extended Thinking & Complex Reasoning) requires the complex reasoning of Level 3 with the addition of planning, investigating, or developing that will most likely require an extended period of time. The extended time period is not a distinguishing factor if the required work is only repetitive and does not require applying significant conceptual understanding and higher-order thinking. At this level the cognitive demands should be high and the work should require in depth analysis using multiple of sources. Students should be required to connect and relate ideas and concepts within the content area or among content areas in order to be at this highest level. The distinguishing factor for Level 4 would be evidenced through a task or product that the cognitive demands have been met. In order for a standard or assessment item to qualify as a Level 4, the student would have to be expected to analyze and synthesize information from multiple sources, examine and explain alternative perspectives across a variety of sources and/or describe and illustrate how common themes and concepts are found across time and place. In some Level 4 performances students will make predictions with evidence as support, develop a logical argument or plan, and develop solutions to problems.

On-demand assessments that do include tasks, products, or extended responses would be classified as Level 4 when the task or response requires evidence that the cognitive requirements have been met.

Some examples that represent but do not constitute all of Level 4 performance are:

- Evaluate using critical sources ways health messages and communication techniques can be targeted for different audiences.
- Create a comprehensive exercise plan based upon knowledge of body and organ systems
- Create an advertising promotion plan that encourages healthy lifestyles.
- Produce a newscast to report on recent events that impact human health at school and in the community.

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