

Classroom Assessment for Student Learning

Secondary ELA and Social Studies

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Educational Excellence

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Stages of Concern
Concerns Based Adoption Model

IMPACT	6	Refocusing	Considering alterations to the innovation
	5	Collaboration	Coordination and cooperation with colleagues
	4	Consequence	Impact of innovation on students
TASK	3	Management	Efficiency, organization, managing the innovation
SELF	2	Personal	Uncertain about the demands of using the innovation and his/her own adequacy in fulfilling those requirements
	1	Informational	General awareness and interest in learning more
	0	Unconcerned	Little awareness or concern

What Gives Formative Assessment Its Power?

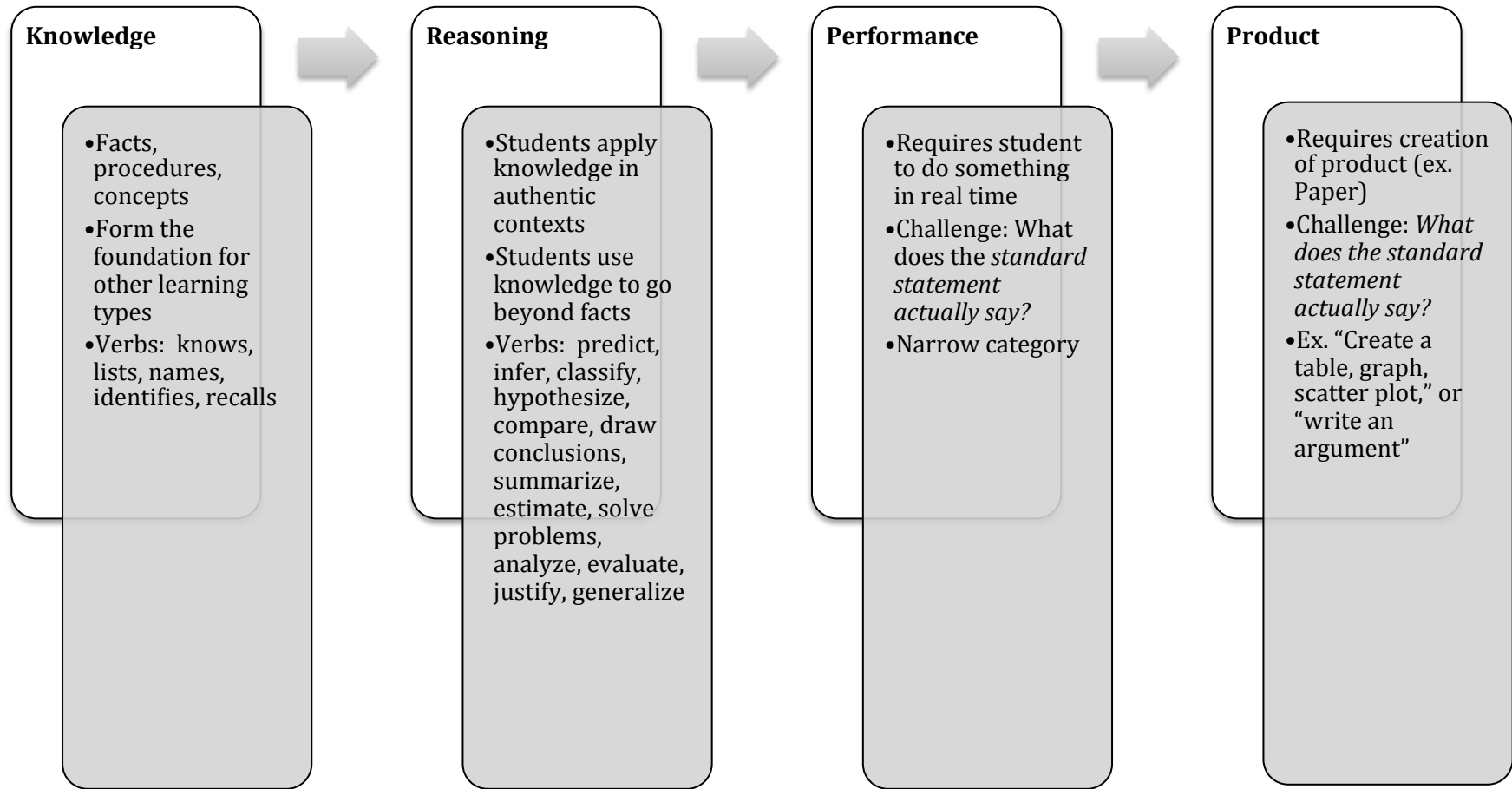
These are the reported gains that have launched a thousand “formative assessment” products. But the size of the achievement gains is only half of the story. The other half is what occurred to cause the gains. In reviewing the interventions featured in the highest-impact studies, Black and William (1998b) make the following observations:

- “Opportunities for students to express their understanding should be designed into any piece of teaching, for this will initiate the interaction through which formative assessment aids learning” (p. 143).
- “The dialogue between pupils and teachers should be thoughtful, reflective, focused to evoke and explore understanding, and conducted so that all pupils have an opportunity to think and to express their ideas” (p. 144).
- “Feedback to any pupil should be about the particular qualities of his or her work, with advice on what he or she can do to improve, and should avoid comparisons to other pupils” (p. 143).
- “If formative assessment is to be productive, pupils should be trained in self-assessment so that they can understand the main purposes of their learning and thereby grasp what they need to do to achieve” (p. 143).

Source: J. Chappuis, R. Stiggins, S. Chappuis, and J. Arter, *Classroom Assessment for Student Learning: Doing It Right—Using It Well*, 2nd ed. (Upper Saddle River, NJ: Pearson Education, 2012), pp. 22–23.

Based on Black and William's observations, what would you say are the highest-impact formative assessment practices?

Learning Target Types



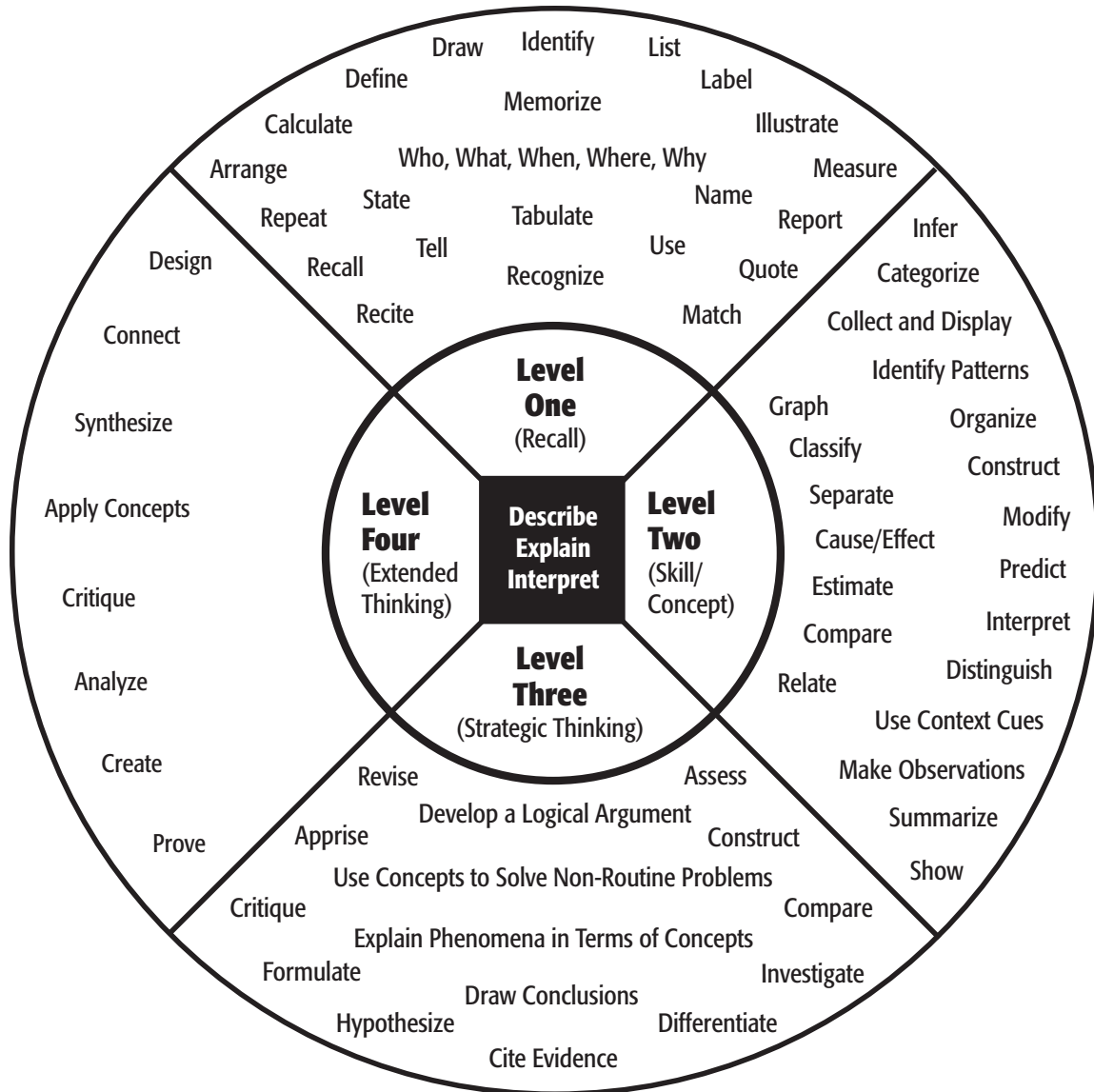
Definitions adapted from: Chappuis, J., Stiggins, R. J., & Arter, J. A. (2011). *Classroom assessment for student learning*. (2 ed.). Boston: Pearson.

Deconstruction Template

Standard Statement (Copied directly from CCSS)	
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Target Types	Learning Targets	Instructional Strategies	Assessment Ideas
<p>Knowledge</p> <p>What facts, procedures, concepts and foundational knowledge does a student need to successfully reach the target?</p>			
<p>Reasoning</p> <p>What reasoning skills does a student need to successfully reach the target?</p>			
<p>Performance</p> <p>What real-time performance does the standard statement require of the student?</p>			
<p>Product</p> <p>What product does the standard statement require the student to create</p>			

Depth of Knowledge (DOK) Levels



Level One Activities	Level Two Activities	Level Three Activities	Level Four Activities
Recall elements and details of story structure, such as sequence of events, character, plot and setting.	Identify and summarize the major events in a narrative.	Support ideas with details and examples.	Conduct a project that requires specifying a problem, designing and conducting an experiment, analyzing its data, and reporting results/solutions.
Conduct basic mathematical calculations.	Use context cues to identify the meaning of unfamiliar words.	Use voice appropriate to the purpose and audience.	Apply mathematical model to illuminate a problem or situation.
Label locations on a map.	Solve routine multiple-step problems.	Identify research questions and design investigations for a scientific problem.	Analyze and synthesize information from multiple sources.
Represent in words or diagrams a scientific concept or relationship.	Describe the cause/effect of a particular event.	Develop a scientific model for a complex situation.	Describe and illustrate how common themes are found across texts from different cultures.
Perform routine procedures like measuring length or using punctuation marks correctly.	Identify patterns in events or behavior.	Determine the author's purpose and describe how it affects the interpretation of a reading selection.	Design a mathematical model to inform and solve a practical or abstract situation.
Describe the features of a place or people.	Formulate a routine problem given data and conditions.	Apply a concept in other contexts.	
	Organize, represent and interpret data.		

Hess' Cognitive Rigor Matrix & Curricular Examples: Applying Webb's Depth-of-Knowledge Levels to Bloom's Cognitive Process Dimensions - Reading

Revised Bloom's Taxonomy	Webb's DOK Level 1 Recall & Reproduction	Webb's DOK Level 2 Skills & Concepts	Webb's DOK Level 3 Strategic Thinking/ Reasoning	Webb's DOK Level 4 Extended Thinking
<p>Remember Retrieve knowledge from long-term memory, recognize, recall, locate, identify</p>	<ul style="list-style-type: none"> Recall, recognize, or locate basic facts, details, events, or ideas explicit in texts Read words orally in connected text with fluency & accuracy Define terms 			
<p>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</p>	<ul style="list-style-type: none"> Identify or describe literary elements (characters, setting, sequence, etc.) Select appropriate words when intended meaning/definition is clearly evident Describe/explain who, what, where, when, or how 	<ul style="list-style-type: none"> Specify, explain, show relationships; explain why, cause-effect Give non-examples/examples Summarize results, concepts, ideas Make basic inferences or logical predictions from data or texts Identify main ideas or accurate generalizations of texts Locate information to support explicit-implicit central ideas 	<ul style="list-style-type: none"> Explain, generalize, or connect ideas using supporting evidence (quote, example, text reference) Identify/ make inferences about explicit or implicit themes Describe how word choice, point of view, or bias may affect the readers' interpretation of a text 	<ul style="list-style-type: none"> Explain how concepts or ideas specifically relate to <i>other</i> content domains or concepts Develop generalizations of the results obtained or strategies used and apply them to new problem situations
<p>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</p>	<ul style="list-style-type: none"> Use language structure (pre/suffix) or word relationships (synonym/antonym) to determine meaning of words 	<ul style="list-style-type: none"> Use context to identify the meaning of words/phrases Obtain and interpret information using text features 	<ul style="list-style-type: none"> Apply a concept in a new context 	<ul style="list-style-type: none"> Illustrate how multiple themes (historical, geographic, social) may be interrelated
<p>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)</p>	<ul style="list-style-type: none"> Identify whether specific information is contained in graphic representations (e.g., map, chart, table, graph, T-chart, diagram) or text features (e.g., headings, subheadings, captions) 	<ul style="list-style-type: none"> Categorize/compare literary elements, terms, facts, details, events Identify use of literary devices Analyze format, organization, & internal text structure (signal words, transitions, semantic cues) of different texts Distinguish: relevant-irrelevant information; fact/opinion Identify characteristic text features; distinguish between texts, genres 	<ul style="list-style-type: none"> Analyze information within data sets or texts Analyze interrelationships among concepts, issues, problems Analyze or interpret author's craft (literary devices, viewpoint, or potential bias) to critique a text Use reasoning, planning, and evidence to support inferences 	<ul style="list-style-type: none"> Analyze multiple sources of evidence, or multiple works by the same author, or across genres, time periods, themes Analyze complex/abstract themes, perspectives, concepts Gather, analyze, and organize multiple information sources Analyze discourse styles
<p>Evaluate Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique</p>			<ul style="list-style-type: none"> Cite evidence and develop a logical argument for conjectures Describe, compare, and contrast solution methods Verify reasonableness of results Critique conclusions drawn 	<ul style="list-style-type: none"> Evaluate relevancy, accuracy, & completeness of information from multiple sources Draw & justify conclusions Apply understanding in a novel way, provide argument or justification for the application
<p>Create Reorganize elements into new patterns/structures, generate, hypothesize, design, plan, produce</p>		<ul style="list-style-type: none"> Generate conjectures or hypotheses based on observations or prior knowledge and experience 	<ul style="list-style-type: none"> Synthesize information within one source or text Develop a complex model for a given situation Develop an alternative solution 	<ul style="list-style-type: none"> Synthesize information across multiple sources or texts Articulate a new voice, alternate theme, new knowledge or perspective

Hess' Cognitive Rigor Matrix & Curricular Examples: Applying Webb's Depth-of-Knowledge Levels to Bloom's Cognitive Process Dimensions - Writing

Revised Bloom's Taxonomy	Webb's DOK Level 1 Recall & Reproduction	Webb's DOK Level 2 Skills & Concepts	Webb's DOK Level 3 Strategic Thinking/ Reasoning	Webb's DOK Level 4 Extended Thinking
Remember Retrieve knowledge from long-term memory, recognize, recall, locate, identify				
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	<ul style="list-style-type: none"> Describe or define facts, details, terms Select appropriate words to use when intended meaning/definition is clearly evident Write simple sentences 	<ul style="list-style-type: none"> Specify, explain, show relationships; explain why, cause-effect Give non-examples/examples Take notes; organize ideas/data Summarize results, concepts, ideas Identify main ideas or accurate generalizations of texts 	<ul style="list-style-type: none"> Explain, generalize, or connect ideas using supporting evidence (quote, example, text reference) Write multi-paragraph composition for specific purpose, focus, voice, tone, & audience 	<ul style="list-style-type: none"> Explain how concepts or ideas specifically relate to <i>other</i> content domains or concepts Develop generalizations of the results obtained or strategies used and apply them to new problem situations
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	<ul style="list-style-type: none"> Apply rules or use resources to edit specific spelling, grammar, punctuation, conventions, word use Apply basic formats for documenting sources 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Revise final draft for meaning or progression of ideas Apply internal consistency of text organization and structure to composing a full composition Apply a concept in a new context Apply word choice, point of view, style to impact readers' interpretation of a text 	<ul style="list-style-type: none"> Select or devise an approach among many alternatives to research a novel problem Illustrate how multiple themes (historical, geographic, social) may be interrelated
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, point of view)	<ul style="list-style-type: none"> Decide which text structure is appropriate to audience and purpose 	<ul style="list-style-type: none"> Compare literary elements, terms, facts, details, events Analyze format, organization, & internal text structure (signal words, transitions, semantic cues) of different texts Distinguish: relevant-irrelevant information; fact/opinion 	<ul style="list-style-type: none"> Analyze interrelationships among concepts, issues, problems Apply tools of author's craft (literary devices, viewpoint, or potential dialogue) with intent Use reasoning, planning, and evidence to support inferences made 	<ul style="list-style-type: none"> Analyze multiple sources of evidence, or multiple works by the same author, or across genres, or time periods Analyze complex/abstract themes, perspectives, concepts Gather, analyze, and organize multiple information sources
Evaluate Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique			<ul style="list-style-type: none"> Cite evidence and develop a logical argument for conjectures Describe, compare, and contrast solution methods Verify reasonableness of results Justify or critique conclusions 	<ul style="list-style-type: none"> Evaluate relevancy, accuracy, & completeness of information from multiple sources Draw & justify conclusions Apply understanding in a novel way, provide argument or justification for the application
Create Reorganize elements into new patterns/structures, generate, hypothesize, design, plan, produce	<ul style="list-style-type: none"> Brainstorm ideas, concepts, problems, or perspectives related to a topic or concept 	<ul style="list-style-type: none"> Generate conjectures or hypotheses based on observations or prior knowledge and experience 	<ul style="list-style-type: none"> Develop a complex model for a given situation Develop an alternative solution 	<ul style="list-style-type: none"> Synthesize information across multiple sources or texts Articulate a new voice, alternate theme, new knowledge or perspective

Depth-of-Knowledge Levels for Four Content Areas

Norman L. Webb

March 28, 2002

Language Arts Levels of Depth of Knowledge

Interpreting and assigning depth-of-knowledge levels to both objectives within standards and assessment items is an essential requirement of alignment analysis. Four levels of depth of knowledge are used for this analysis.

Reading (based on Wixson, 1999)

Level 1

Level 1 requires students to receive or recite facts or to use simple skills or abilities. Oral reading that does not include analysis of the text as well as basic comprehension of a text is included. Items require only a shallow 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:

- Support ideas by reference to details in the text.
 - Use a dictionary to find the meaning of words.
 - Identify figurative language in a reading passage.

Level 2

Level 2 includes the engagement of some mental processing beyond recalling or reproducing a response; it requires both comprehension and subsequent processing of text or portions of text. Intersentence analysis of inference is required. Some important concepts are covered but not in a complex way. Standards and items at this level may include words such as summarize, interpret, infer, classify, organize, collect, display, compare, and determine whether fact or opinion. Literal main ideas are stressed. A Level 2 assessment item 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.
- Predict a logical outcome based on information in a reading selection.
- Identify and summarize the major events in a narrative.

Level 3

Deep knowledge becomes more of a focus at Level 3. Students are encouraged 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. Items may involve abstract theme identification, inference across an entire passage, or students' application of prior knowledge. Items may also involve more 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.
- Summarize information from multiple sources to address a specific topic.
- Analyze and describe the characteristics of various types of literature.

Level 4

Higher order thinking is central and knowledge is deep at Level 4. The standard or assessment item at this level will probably be an extended activity, with extended time provided. 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. Students 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. 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

Level 1 requires the student to write or recite simple facts. This writing or recitation does not include complex synthesis or analysis but 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.

Level 2

Level 2 requires some mental processing. At this level students are engaged in first draft writing or brief extemporaneous speaking for a limited number of purposes and audiences. 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.

Level 3

Level 3 requires some 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 voice appropriate to the purpose and audience.
- Edit writing to produce a logical progression of ideas.

Level 4

Higher-level thinking is central to Level 4. The standard at this level is a multi-paragraph composition that demonstrates synthesis and analysis of complex ideas or themes. There is 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. An example that represents but does not constitute all of Level 4 performance is:

- Write an analysis of two selections, identifying the common theme and generating a purpose that is appropriate for both.

Source of Challenge Criterion

The Source of Challenge criterion is only used to identify items where the major cognitive demand is inadvertently placed and is other than the targeted language arts skill, concept, or application. Cultural bias or specialized knowledge could be reasons for an item to have a source of challenge problem. Such items characteristics may cause some students to not answer an assessment item or answer an assessment item incorrectly or at a lower level even though they have the understanding and skills being assessed.

Mathematics depth-of-knowledge levels

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, and straight algorithmic procedure should be included at this lowest level. Other key words that signify a Level 1 include “identify,” “recall,” “recognize,” “use,” and “measure.” Verbs such as “describe” and “explain” could be classified at different levels depending on what is to be described and explained.

Level 2 (Skill/Concept) includes the engagement of some mental processing beyond a habitual response. A Level 2 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. Keywords that generally distinguish a Level 2 item include “classify,” “organize,” “estimate,” “make observations,” “collect and display data,” and “compare data.” These actions imply more than one step. For example, to compare data requires first identifying characteristics of the objects or phenomenon and then grouping or ordering the objects. Some action verbs, such as “explain,” “describe,” or “interpret” could be classified at different levels depending on the object of the action. For example, if an item required students to explain how light affects mass by indicating there is a relationship between light and heat, this is considered a Level 2. 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. Other Level 2 activities include explaining the purpose and use of experimental procedures; carrying out experimental procedures; making observations and collecting data; classifying, organizing, and comparing data; and organizing and displaying data in tables, graphs, and charts.

Level 3 (Strategic Thinking) 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. An activity, however, that has more than one possible answer and requires students to justify the response they give would most likely be a Level 3. 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 problems.

Level 4 (Extended Thinking) requires complex reasoning, planning, developing, and thinking most likely over 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. For example, if a student has to take the water temperature from a river each day for a month and then construct a graph, this would be classified as a Level 2. However, if the student is to conduct a river study that requires taking into consideration a number of variables, this would be a Level 4. At Level 4, the cognitive demands of the task should be high and the work should be very complex. Students should be required to make several connections—relate ideas

within the content area or *among* content areas—and have to select one approach among many alternatives on how the situation should be solved, in order to be at this highest level. Level 4 activities include designing and conducting experiments; making connections between a finding and related concepts and phenomena; combining and synthesizing ideas into new concepts; and critiquing experimental designs.

Science Levels of Depth-of-Knowledge

Interpreting and assigning depth-of-knowledge levels to objectives both within standards and assessment items is an essential requirement of alignment analysis. Four levels of depth of knowledge are used for this analysis. Because the highest (fourth) DOK level is rare or even absent in most standardized assessments, reviewers usually will be making distinctions among DOK levels 1, 2 and 3. Please note that, in science, “knowledge” can refer both to content knowledge and knowledge of science processes. This meaning of knowledge is consistent with the National Science Education Standards (NSES), which terms “Science as Inquiry” as its first Content Standard.

Level 1. Recall and Reproduction

Level 1 is the recall of information such as a fact, definition, term, or a simple procedure, 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 procedure (like a recipe), or perform a clearly defined series of steps. A “simple” procedure is well-defined and typically involves only **one-step**. Verbs such as “identify,” “recall,” “recognize,” “use,” “calculate,” and “measure” generally represent cognitive work at the recall and reproduction level. Simple word problems that can be directly translated into and solved by a formula are considered Level 1. Verbs such as “describe” and “explain” could be classified at different DOK levels, depending on the complexity of what is to be described and explained.

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.” In other words, if the knowledge necessary to answer an item automatically provides the answer to the item, then the item is at Level 1. If the knowledge necessary to answer the item does not automatically provide the answer, the item is at least at Level 2. 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 phenomenon.
- Perform a routine procedure such as measuring length.

Level 2. Skills and Concepts

Level 2 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. Items require students to make some decisions as to how to approach the question or problem. Keywords that generally distinguish a Level 2 item include “classify,” “organize,” “estimate,” “make observations,” “collect and display data,” and “compare data.” These actions imply **more than one step**. For example, to compare data requires first identifying characteristics of the objects or phenomenon and then grouping or ordering the objects. Level 2 activities include making observations and collecting data; classifying, organizing, and comparing data; and organizing and displaying data in tables, graphs, and charts.

Some action verbs, such as “explain,” “describe,” or “interpret,” could 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 a Level 2. An item that requires interpretation from a complex graph, such as making decisions regarding features of the graph that need to 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 between facts, terms, properties, or variables.
- 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

Level 3 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.
- Solve non-routine problems.
- Develop a scientific model for a complex situation.

- Form conclusions from experimental data.

Level 4. Extended Thinking

Tasks at Level 4 have **high cognitive demands** and are **very complex**. Students are required to make several connections—relate ideas *within* the content area or *among* content areas—and have to select or devise one approach among many alternatives on how the situation can be solved. Many on-demand assessment instruments will not include any assessment activities that could be classified as Level 4. However, standards, goals, and objectives can be stated in such a way as to expect students to perform extended thinking. “Develop generalizations of the results obtained and the strategies used and apply them to new problem situations,” is an example of a Grade 8 objective that is a Level 4. Many, but not all, performance assessments and open-ended assessment activities requiring significant thought will be Level 4.

Level 4 requires complex reasoning, experimental design and planning, and **probably will require an extended period of time** either for the science investigation required by an objective, or for carrying out the multiple steps of an assessment item. However, 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. For example, if a student has to take the water temperature from a river each day for a month and then construct a graph, this would be classified as a Level 2 activity. However, if the student conducts a river study that requires taking into consideration a number of variables, this 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, deduct the fundamental relationship between several controlled variables.
- Conduct an investigation, from specifying a problem to designing and carrying out an experiment, to analyzing its data and forming conclusions.

Social Studies Levels of Depth of Knowledge for Social Studies

Interpreting and assigning depth-of-knowledge levels to both objectives within standards and assessment items is an essential requirement of alignment analysis. Four levels of depth of knowledge are used for this analysis.

Level 1 Recall of Information

Level 1 asks 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.

Level 2 Basic Reasoning

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; 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.”

Level 3 Complex Reasoning

Level 3 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 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.

Level 4 Extended Reasoning

Level 4 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 be very complex. 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 evidence through a task or product that the cognitive demands have been met. A Level 4 performance 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 performance students will make predictions with evidence as support, develop a logical argument, or plan and develop solutions to problems.

Many on-demand assessment instruments will not include assessment activities that could be classified as Level 4. However, standards, goals, and objectives can be stated so as to expect students to perform thinking at this level. 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.

Source of Challenge Criterion

The Source of Challenge criterion is only used to identify items where the major cognitive demand is inadvertently placed and is other than the targeted social studies content, concept, skill and application. Excessive reading demands, cultural bias, or specialized knowledge could be reasons for an item to have a source of challenge problem. Such item characteristics may cause some students to not answer an assessment item or answer an assessment item incorrectly even though they have the social studies content knowledge, understanding and skills being assessed. Items with an appropriate source of challenge level will differentiate between those students who have the social studies knowledge and understanding the assessment item intends to measure from those students who do not have this knowledge.

■ Activity 4.2 Target–Method Match Template

Learning Target		Target Type				Assessment Method			
		K	R	S	P	SR	WR	PA	PC
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									

■ Activity 4.5 Form A: Blueprint for a Test with Multiple Assessment Methods

Unit:			
Learning Targets	Target Type	Assessment Method	Percent Importance

■ Activity 4.5 Form B: Blueprint for a Selected Response Assessment

Learning Targets	Problem #s	Total Points

■ Activity 5.2 Test of Franzipanics

1

Directions: Circle the correct answer for each question. Then identify the item flaw that allowed you to obtain the correct answer without knowing the subject.

1. The purpose of the cluss in furmpaling is to remove
- a. cluss-prags
 - b. tremalis
 - c. cloughs
 - d. plumots

Flaw:

2. Trassig is true when
- a. lusp trasses the vom
 - b. the viskal fans, if the viskal is donwil or zortil
 - c. the belgo frulls
 - d. dissles lisk easily

Flaw:

3. The sigla frequently overfesks the trelsum because
- a. all siglas are mellious
 - b. siglas are always votial
 - c. the trelsum is usually tarios
 - d. no trelsa are feskable

Flaw:

4. The fribbled breg will minter best with an
- a. derst
 - b. morst
 - c. sorter
 - d. ignu

Flaw:

5. Among the reasons for trisal doss are
- a. the sabs foped and the foths tinzed
 - b. the kredges roted with the orots
 - c. few rakobs were accepted in sluth
 - d. most of the polats were thonced

Flaw:

6. The mintering function of the ignu is most effectively carried out in connection with
- a. a raxma tol
 - b. the groshing stantol
 - c. the fribbled breg
 - d. a frally sush

Flaw:

■ Activity 5.2 Answers to Franzipanic Test

1

1 = a (The word “cluss” is repeated in the stem and the answer choice.)

2 = b (It’s the longest answer.)

3 = c (“Usually” is more often correct than “all,” “always,” and “no.”)

4 = d (“An” in the stem tells you the correct answer will begin with a vowel.)

5 = a (“Are” in the stem tells you the correct answer will include more than one reason.)

6 = c (This is an example of inter-item cluing with question 4.)

Descriptive or Evaluative Feedback?

Mark each example of descriptive feedback with a D and each example of evaluative feedback with an E. If you believe it is neither, mark it with an X.

_____ Try harder next time.

_____ 70%

_____ You maintained eye contact with the audience throughout your whole presentation.

_____ Good job of getting ready for lunch.

_____ Table 3 is ready for lunch. They have their desks clear, they are sitting down, and they are quiet.

_____ ☺

_____ +

_____ What you have written is a hypothesis because it is a proposed explanation. You can improve it by writing it as an “if...then...” statement.

_____ B+. Good Work.

_____ You made some simple mistakes with multiplying three-digit numbers. Next time, take a few minutes when you’ve finished to check your work.

_____ Emerging

_____ Your work is consistently above average.



■ Activity 5.5 Reviewing and Analyzing My Results, Option A

Reviewing My Results

Name: _____ Assignment: _____ Date: _____

Please look at your corrected test and mark whether each problem is right or wrong. Then look at the problems you got wrong and decide if you made a simple mistake. If you did, mark the “Simple Mistake” column. For the remaining problems you got wrong, mark the “Don’t Get It” column.

Problem	Learning Target	Right	Wrong	Simple Mistake	Don’t Get It

Analyzing My Results

Name: _____ **Assignment:** _____ **Date:** _____

I AM GOOD AT THESE!

Learning targets I got right:

I AM PRETTY GOOD AT THESE, BUT NEED TO DO A LITTLE REVIEW

Learning targets I got wrong because of a simple mistake: _____

What I can do to keep this from happening again: _____

I NEED TO KEEP LEARNING THESE

Learning targets I got wrong and I'm not sure what to do to correct them: _____

What I can do to get better at them: _____

Source: Adapted from *Seven Strategies of Assessment for Learning* (pp. 212 - 213), by J. Chappuis, 2009, Upper Saddle River, NJ: Pearson Education. Adapted by permission.

■ Activity 5.5 Reviewing and Analyzing My Results, Option B

Reviewing My Results

Name: _____ Assignment: _____ Date: _____

As you answer each question, decide whether you feel confident or unsure in your answer and mark the corresponding box.

Problem #	Learning Target #	Confident	Unsure		Right	Wrong	Simple Mistake	Don't Get It

Analyzing My Results

1. After your test has been corrected, identify which problems you got right and which you got wrong by putting Xs in the “Right” and “Wrong” columns.
2. Of the problems you got wrong, decide which ones were due to a simple mistake and mark the “Simple Mistake” column. (If it was a simple mistake, you can correct it without help.)
3. For all of the remaining wrong answers, mark the “Don't Get It” column.

Analyzing My Results

Name: _____ Assignment: _____ Date: _____

My Strengths

To identify your areas of strength, write down the learning targets for problems you felt confident about **and** got right.

Learning Target #	Learning Target or Problem Description

My Highest Priority for Studying

To determine what you need to study most, write down the learning targets for problems you marked “Don’t Get It” (problems you got wrong NOT because of a simple mistake).

Learning Target #	Learning Target or Problem Description

What I Need to Review

To determine what you need to review, write down the learning targets for problems you got right but were unsure of and for problems on which you made simple mistakes.

Learning Target #	Learning Target or Problem Description

Source: Adapted from *Seven Strategies of Assessment for Learning* (pp. 214 - 215), by J. Chappuis, 2009, Upper Saddle River, NJ: Pearson Education. Adapted by permission.

Give One, Get One
