



Depth of Knowledge: Assessing Curriculum with Depth and Meaning

National Career Pathways Conference
Atlanta, Georgia
October 1, 2009



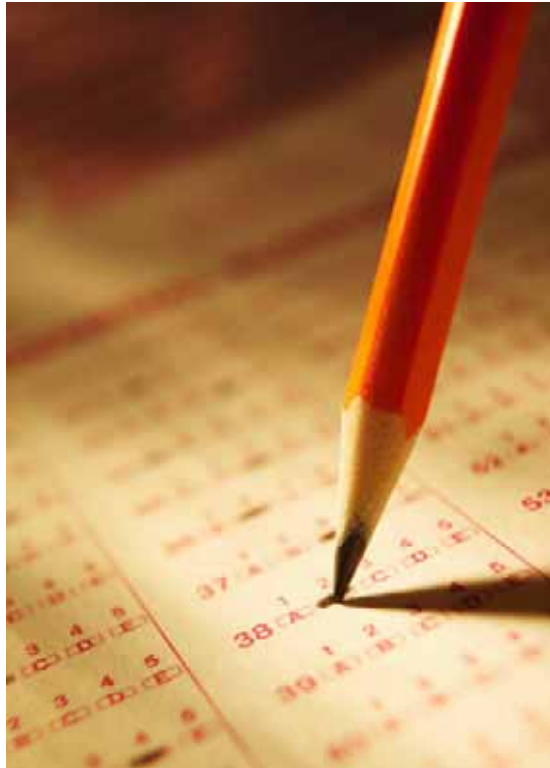
Call the Plumber...



Depth of Knowledge: Why?

- No Child Left Behind (NCLB) now requires states to align their assessments “with the depth and breadth of the state’s academic content standards at all grade levels.” (*U.S. Department of Education, 2003, p.12*)

Depth-of-Knowledge Consistency



Measures the degree to which the knowledge elicited from students on the assessment is as complex as what students are expected to know and do as stated in the curriculum/GLE's/Show-Me-Standards.

Missouri School Improvement Program: Fourth Cycle Observation Form,
Margie Vandeven, DESE, November 15, 2007

What is Webb's Depth of Knowledge (DOK)

- Descriptive, not a taxonomy
- Focuses on content standard in order to successfully complete an assessment/standard task.
- Not the same as difficulty

Lewis, Starr and Nancy LaCount. "Kentucky's Core Content for Assessment, Version 4.0." Kentucky Department of Education, 2005.

What Are Good Competencies?

- They spell out what is expected of students
- They provide a link across the disciplines of knowledge although they are not specific to the disciplines
- They are the outcomes of learning including acquired skills, abilities and knowledge
- And, they are *specific* to the instructional goals!

DOK and Rigor & Relevance

Instruction, assignments, and classroom assessment must incorporate the expectation of rigor for students associated with the DOK levels of all objectives for that grade and content area.



DOK v. Bloom's Taxonomy

Webb's Depth of Knowledge

Recall

Skill and Concept

Strategic Thinking

Extended Thinking

Bloom's Taxonomy

Knowledge

Comprehension

Application

Analysis

Synthesis and
Evaluation

Four Levels of DOK

Level 1 Recall

Recall of a fact, information or procedure

Level 2 Skill/Concept

Use information or conceptual knowledge, two or more steps, etc.

Level 3 Strategic Thinking

Requires reasoning, developing a plan or sequence of steps, some complexity, more than one possible answer

Level 4 Extended Thinking

Requires an investigation, time to think and process multiple conditions of the problem

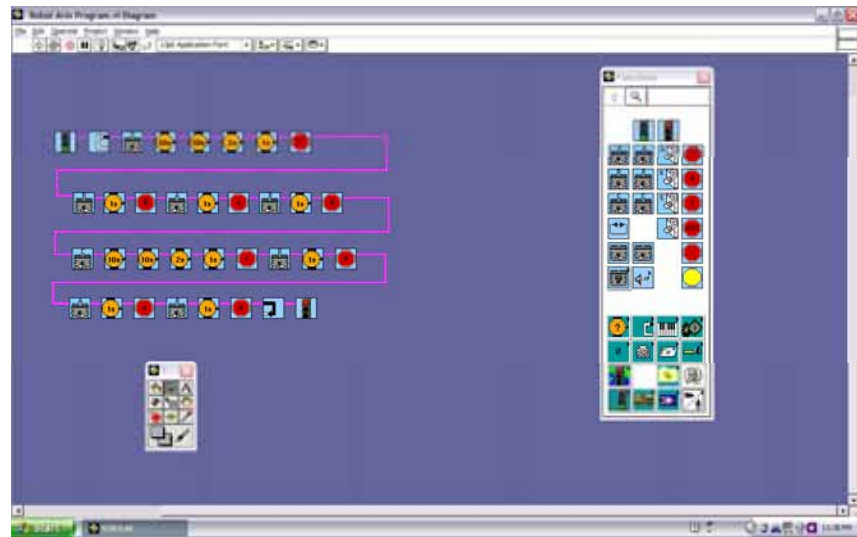
Level 1 Recall



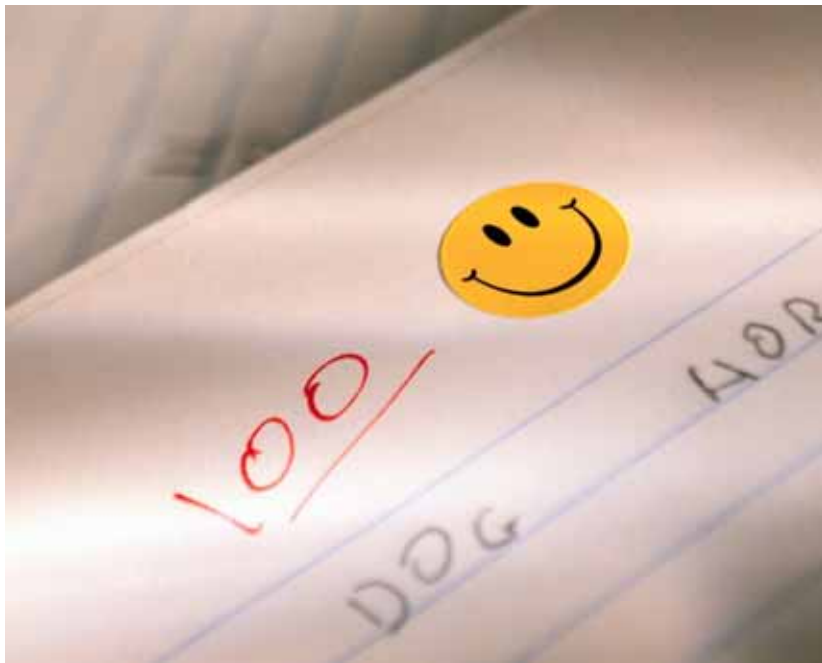
- Focus is on students to work with specific facts, definitions. Items only require students to have a shallow understanding of text.

Level 2 Skill & Concept

- Students are required to apply skills and concepts. They must comprehend and process portions of a text; main ideas are stressed.



Level 3 Strategic Thinking



- Students are required to use complex and abstract thinking. They are encouraged to go beyond the text—to explain, generalize and connect ideas.

Level 4 Extended Thinking

- Students are required to use *higher order* thinking. They are asked take material from one content area and apply it to another.



DOK and Assessment

“Firm evidence shows that formative assessment is an essential component of classroom work and that its development can raise standards of achievement.”

P. Black & D. Williams (1998) inside the Black Box: Raising Standards Through Classroom Assessment. *Phi Delta Kappa*, 80(2)

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

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Describe the physical features of a place

1

Specify a problem, identify solution paths, solve the problem, and report the results

4

Explain cause-effect of historical events

2

Analyze or evaluate the effectiveness of literary elements (plot, setting, conflict, point-of-view...)

3

Identify and summarize the major events, problem, solution, conflicts in a literary text

2

Locate or recall facts found in text

1

Solve multi-step problem and provide support with a mathematical explanation that justifies the answer

3

Gather, analyze, organize and interpret data from multiple (print and non-print sources) to draft a reasoned report

4

Analyze and explain multiple perspectives or issues within or across time periods or events

4

Compare desert and tropical areas

2

Determine the area of a triangle given a drawing or labels

1

Classify plane and three dimensional figures

1

Identify and summarize the major events,
problem, solution, conflicts in a literary text

2

Locate or recall facts found in text

1

Solve multi-step problem and provide support
with a mathematical explanation that justifies
the answer

3

Depth of Knowledge and the Show-Me-Standards

- Provides an objective tool to assess Performance and Knowledge Standards
- Provides a ***hard copy*** document for proof of assessment



Depth of Knowledge and Programs of Study

- Gives instructors the tool to compare curricula between secondary and postsecondary
- Provides assessment for MSIP requirements



DOK and Programs of Study

- Curriculum is cross walked with Knowledge and Skill Statements
- Gaps and strengths on curriculum are identified
- 4+2 transition is established for students



DOK in Review

- Depth of Knowledge (DOK) is a scale of cognitive demand.
- DOK requires looking at the assessment item—not student work—in order to determine the level.
- DOK is NOT determined by the verb, but the context in which the verb is used and the depth of thinking required.

One More Thought...



Questions?

Sources

Daggett, Willard. International Center for Leadership in Education. www.leadered.com

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www.kyaea.org/index_id_200.htm

Lewis, Starr and Nancy LaCount. “Kentucky’s Core Content for Assessment, Version 4.0.” Kentucky Department of Education, 2005.

Webb, Norman L. “Alignment, Depth of Knowledge, & Change.”, Wisconsin Center for Education Research, 2005.

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Mark's Appendix

- Marzano's Dimension of Thinking
- Bloom's Taxonomy
- Norman Webb's Alignment System
- Daggett's Rigor/Relevance Framework

Marzano's Dimension of Thinking

Gathering information **observing, recall, question**

Organizing Information **represent, compare, classify, order**

Analyzing Information **attributes and components, patterns and relationships, main points, accuracy and adequacy**

Generating Information **infer, predict, elaborate**

Integrating Information **summarize, restructure**

Evaluating Information **establish criteria, verify**

Bloom's Taxonomy

Knowledge Recall of specifics and generalizations, of methods and processes; and of patterns, structure, or setting.

Comprehension Knows what is being communicated and can use the material or idea without necessarily relating it.

Applications Use of abstractions in particular and concrete situations.

Analysis Make clear the relative hierarchy of ideas in a of material or to make explicit the relations among the ideas or both.

Synthesis Assemble parts into a whole.

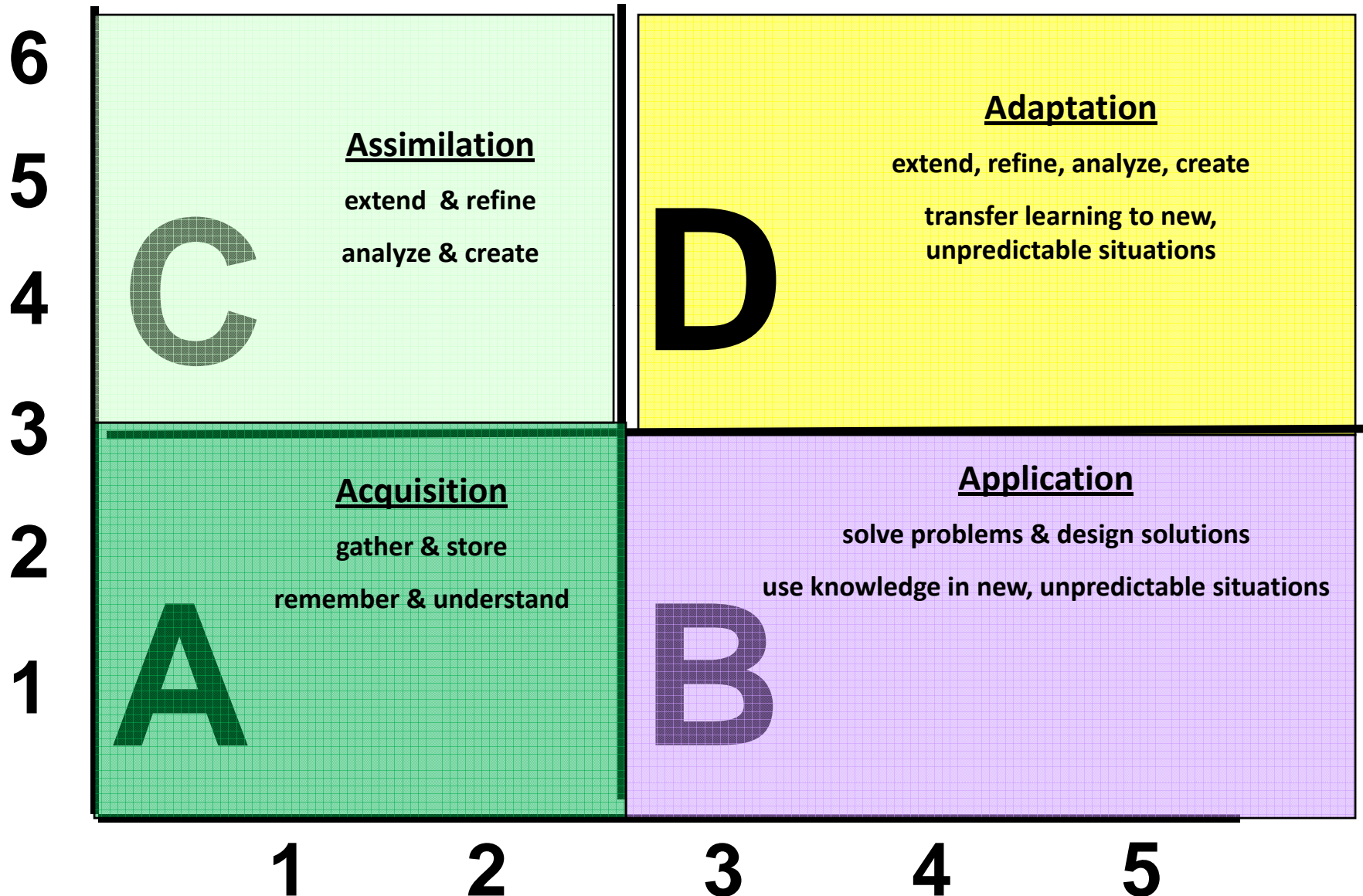
Evaluation Judgments about the value of material and methods used for particular purposes.

Depth of Knowledge (DOK)

Norman Webb's alignment system

- **Categorical Concurrence** --- measures the extent to which the same or consistent categories of content appear in the standards and the assessments.
- **Depth-of-Knowledge Consistency** --- measures the degree to which the knowledge elicited from students on the assessment is as complex within the context area as what students are expected to know and do as stated in the standards.
- **Range-of-Knowledge Correspondence** --- determines whether the span of knowledge expected of students on the basis of a standard corresponds to the span of knowledge that students need in order to correctly answer the corresponding assessment items/activities.
- **Balance of Representation** --- measures whether objectives that fall under a specific standard are given relatively equal emphasis on the assessment.
- **Source of Challenge** --- determines whether the primary difficulty of the assessment items is significantly related to students' knowledge and skill in the content area as represented in the standards.

Rigor/Relevance Framework



Thank you for your participation.

