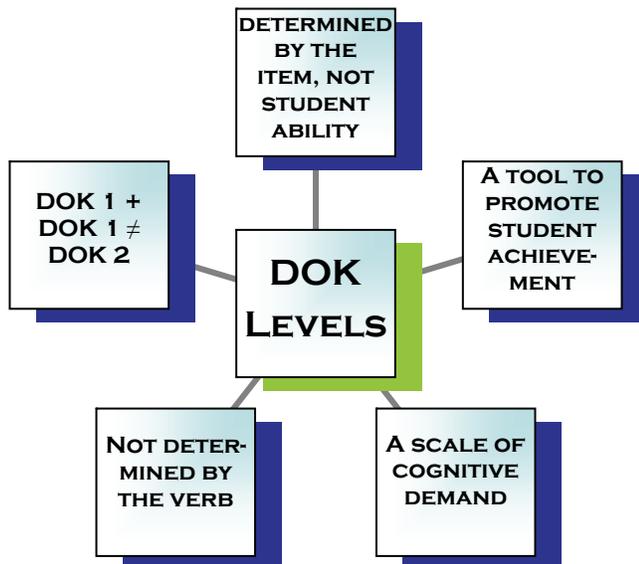# DEPTH OF KNOWLEDGE: AN EFFECTIVE TOOL FOR EDUCATING STUDENTS

In order to ensure student learning at the highest levels, practices within our classrooms must be comprehensive and rigorous. Furthermore, students who are provided with comprehensive and rigorous learning opportunities perform better on state achievement tests than those who do not. In an effort to create these positive learning opportunities and ensure that the standards are accurately assessed, the Nevada Department of Education has adopted and modified Norman Webb's Depth of Knowledge (DOK) levels. The Department of Education feels the DOK levels not only provide for a greater depth and breadth of learning, but also meet the requirements of academic rigor required by No Child Left Behind.

These DOK levels will be incorporated into all of Nevada's state tests starting in 2010, with field test items leveled to DOK in 2009.

DETERMINED BY THE ITEM, NOT STUDENT ABILITY

DOK 1 + DOK 1 ≠ DOK 2

DOK LEVELS

A TOOL TO PROMOTE STUDENT ACHIEVEMENT

NOT DETERMINED BY THE VERB

A SCALE OF COGNITIVE DEMAND

A Familiar Face

DOK is familiar territory to Southern Nevada's teachers because DOK reinforces exemplary classroom practice and is consistent with both the *Components of an Effective Lesson* and *Teacher Expectancies*. Most teachers learned about Bloom's Taxonomy in pedagogy classes during their teacher preparation program. In Bloom's Taxonomy, different verbs represent six levels of cognitive processes. However, unlike Bloom's system, the DOK levels are not a taxonomical tool that uses verbs to classify the level of each cognitive demand. The DOK level is determined by the degree of mental processing required by the student to meet the objectives of a particular classroom activity. In the case of assessment, DOK is the cognitive demand required to correctly answer test questions. It is important to note that DOK levels will replace the ability levels (A1, A2, and A3) on the state standardized tests as DOK more closely reflects the depth and breadth we would like our students to achieve in the classroom.

What are DOK the Levels?

The DOK level describes the kind of thinking involved in the task, not whether it will be completed correctly. A greater DOK level requires greater conceptual understanding and cognitive processing by the students. On average, students who reach greater DOK levels more regularly will have increased student achievement.

Level 1

Level 1 involves recall and the response is automatic. Students either know the answer or not. Level 1 activities require students to demonstrate a rote response, follow a set of procedures, or perform simple calculations.

Level 2

Level 2 activities are more complex and require students to engage in mental processing and reasoning beyond a habitual response. These activities make students decide how to approach the problem, involving interpreting and developing relationships among concepts.

Level 3

Level 3 activities necessitate higher cognitive demands than the previous two levels. At Level 3, students are providing evidentiary support and reasoning for conclusions they draw. In most instances, having students explain and justify their thinking is at a Level 3. Typically, Level 3 activities have more than one correct response or approach to the problem.

Level 4

Level 4 includes those tasks in which students must demonstrate reasoning, planning, and developing connections within and beyond a content area. These activities usually occur over an extended period of time and cannot be assessed on the Criterion-Referenced Tests (CRT) or High School Proficiency Exam (HSPE). However, these tasks should be incorporated into the curriculum since it is this type of thinking we want to encourage from all of our students.

Not all state standards and benchmarks support DOK levels 3 and 4. Each benchmark has a "ceiling" DOK level depending on the content. Specific information about the ceiling DOK level for each benchmark can be found on the Nevada Department of Education website.

DOK levels are **cumulative**. For example, a DOK level 3 activity will probably contain DOK level 1 and 2 elements; however, DOK levels are **NOT** **additive**. You cannot create a DOK level 2 activity with only DOK level 1 elements (i.e., a DOK level 1 + DOK level 1 does not equal a DOK level 2).

Using DOK

Following are some questions to consider when analyzing your curriculum tasks for DOK.

♦ What level of work are the students most commonly required to perform?

♦ What is the complexity of the task rather than the difficulty?

♦ What are all the skills and knowledge scaffolding that the students will have already needed to build to complete the task?

The following table shows what DOK looks like in the classroom.

Examples of what Depth of Knowledge look like in the classroom				
Content Area	**Level 1**	**Level 2**	**Level 3**	**Level 4**
Elementary Language Arts	Sort known words as quickly as possible.	Find words in text that illustrate a defined pattern. (Word Hunt)	Create an open sort and define the rule and explain.	Illustrate through authentic writing stability in pattern and content of identified stage.
Elementary Mathematics	Collect data on the number of teeth lost by students in one 2nd grade classroom.	Organize these data using a graph or chart (e.g., a line plot).	Using the graph, predict how many teeth would be lost by all the 2nd grade classes in the schools and justify your answer.	Come up with a model to estimate how many teeth are lost by 2nd grade students in the United States in one year. Include the type of data you would need to collect and explain how your model works.
Middle School Science	Define the following terms: electrical generator, electrical motor, magnetic field, and electrical current.	Compare and contrast how an electrical motor operates to how an electrical generator operates.	Design and conduct an experiment to demonstrate that electrical currents produce magnetic forces.	Research and design a system to lift heavy objects using the conversion of electrical energy to mechanical energy. Build a prototype of the system using materials found in the classroom.
U.S. History	Name the U.S. presidents in order.	Using the left and right political continuum, categorize the presidents of the 20th and 21st centuries according to their political standing.	Hypothesize how Dwight D. Eisenhower would react to today's world political situation.	Analyze the strategies and effectiveness of George H. W. Bush's war strategies in the Persian Gulf with the war strategies of George W. Bush in Iraq.
High School Music	Name several composers from the Baroque and Classical periods.	Describe differences between the Baroque and Classical periods.	Critique, compare, and contrast pieces of music from the Baroque and Classical periods.	Choose a period and develop a 16 measure piece of music from that style.

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