Science Dissected

Depth of Knowledge Levels
The DL on DOK

Most teachers learned about Bloom's Taxonomy in pedagogy classes during their teacher preparation program. In Bloom's taxonomy, verbs are associated with six levels of cognitive processes. Nevada uses the Depth of Knowledge (DOK) Levels to rank the questions on the 8th grade Science Criterion Reference Test (CRT) and the Science High School Proficiency Exam (HSPE). 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 correctly answer the question.**

Level 1 questions involve recall and the response is automatic, meaning the students either know the answer or they do not. Level 1 questions require the students to demonstrate a rote response, follow a set of procedures, or perform simple calculations. **Level 2** questions are more complicated and require students to engage in mental processing and reasoning beyond a habitual response. These questions make students decide how to approach the problem. Level 2 questions involve interpreting and developing relationships among concepts. **Level 3** questions necessitate higher cognitive demands than the previous two levels. A Level 3 response provides support and reasoning for conclusions that are drawn. In most instances, having the students explain _and_ justify their thinking is a Level 3 question. Typically, a Level 3 question has more than one correct response or approach to the problem. Although **Level 4** questions cannot be assessed in the format of the CRT or HSPE, they should still be incorporated into the curriculum. In Level 4, students must demonstrate reasoning, planning, and developing connections within and beyond a content area. The activities that involve Level 4 typically occur over extended periods of time. It is the teacher's responsibility to ensure their students are exposed to a range of questions and activities that will prepare them for the questions they will encounter on high stakes exams that the students will take throughout their school career.

Summary of the DOK Levels

Level 1

Recall

Level 2

Conceptual Understanding

Level 3

Strategic Thinking

Level 4

Extended Thinking

Did you know?

A majority of questions on 8th grade Science CRT (52%) and the Science HSPE (50%) are DOK Level 2 questions.

RPDP has developed the **Targeted Inventions for Proficiency in Science (TIPS**) Website for secondary science teachers. The website provides background information, common student misconceptions, sample questions, and internet-based resources for all of the benchmarks in both the 6-8 and 9-12 grade band of the Nevada Science Standards.