ExamView Learning Series

Bloom's Taxonomy Levels Assigned to **Exam***View*® *Learning Series* Test Questions

There are many ways of expressing and applying "Bloom's Taxonomy." Though Dr. Bloom's intent was to develop a classification framework for writing educational objectives, the taxonomy has continued to provide a means for categorizing the level of abstraction in test questions that commonly occur in educational settings. This is a useful function given the fact that serious questions persist regarding determination of difficulty levels or complexity of questions on both formative and summative tests administered in schools across the country. While opinions differ as to whether Bloom's Taxonomy applies to the notion of "difficulty level," there is reason to assume that a direct connection can be made between how "difficult" a given question is and the level of cognitive complexity required in student thinking to respond to that question.

In addition to providing a means for categorizing questions in terms of their difficulty or complexity for assessment purposes, assigning Bloom's levels to test questions may also be of assistance to educators in developing appropriate strategies for promoting student thinking at multiple levels—that is, the Bloom's level assignments could serve as a tool for transforming test results into a mechanism for learning—merit enough in and of itself.

The six levels of Bloom's Taxonomy for the cognitive domain are as follows: knowledge, comprehension, application, analysis, synthesis, and evaluation. The following six level descriptors were used in assigning Bloom's levels to the **Exam***View*® *Learning Series* test questions.

Bloom's Level	Description
Knowledge	"Knowledge" items require students to recognize or recall information. These items typically involve direct statement of definitions (terminology), specific facts, and other specifics regarding material *where direct exposure is known* (e.g., trends, sequences, features, structures, conventions, classifications, categories, criteria, universal and even abstract principles, generalizations, and theories). A key aspect of the knowledge level question is that even if it appears to focus in areas of abstraction or logic, it is drawn directly with little modification from other material or instruction, and characteristically involves students remembering (recalling) appropriate, previously learned information.
Comprehension	"Comprehension" items require students to selectively translate their knowledge (see previous level) in order to answer a question. These test items demonstrate a student's *understanding* of facts and ideas by organizing, retelling or giving (restating in their own words) descriptions, and stating main ideas. In doing so, students are often called upon to paraphrase or summarize details or information of a fairly straightforward nature, and explain relationships that may involve giving examples or making sense out of information, yet does not involve moving into very new areas (application) or making distinctions and differentiating among information (analysis). A principal feature of a "comprehension" level question is that it seeks to determine if a student has a sufficient enough understanding to organize and arrange material mentally and use that reorganization to respond to straightforward questions involving basic understanding.
Application	"Application" items require students to use comprehension of a concept in order to respond. These items typically involve a *new but fairly concrete* situation to which the previously learned information must be applied; if not, it often is only transfer in the sense of a comprehension-level question. Application can require that students perform operations, such as straightforward calculations and use of equations toward problems that have single or best answers, even including mathematics word problems as long as the situation does not require so many distinctions or parallels that it moves into the arena of analysis.

Bloom's Level	Description
Analysis	"Analysis" items are higher-order questions that require students to think critically and in depth. The thinking involved in analysis is mostly deductive (whole to parts), as students are asked to break down or disaggregate material into its component parts, to examine and discriminate among these parts, and to make sense of an overall organizational structure and draw conclusions to the extent possible without synthesizing findings to come to understandings about new and as-yet unseen or unclarified phenomena. During analysis, students are most typically extending an application of their understanding of a concept. It is at the analysis level that students first become intimately aware of the useful application and transfer of understanding outside of the traditional classroom setting. Analysis is, by these criteria, the beginning of definitive higher-level thinking.
Synthesis	"Synthesis" items require students to respond to new problems or "what if" situations by organizing and assembling parts and pieces of prior knowledge, information, or ideas into a new pattern or whole not obvious before. These pieces of information often seem disparate, sometimes divergent or even disconnected, when viewed alone, so that the complexity of "sense-making" often involves a good degree of creativity, and usually a level of problem solving and proposing of solutions that exceed that which would be required of students at the analysis level. The reasoning required of students is often inductive (parts to whole), moving from parts to the larger picture, and can also precede a follow-up analysis or application question such as, "How might this work?" or "Apply this method to solve problem A."
Evaluation	"Evaluation" items are high-level questions that do not have a single correct answer. They require the student to judge the merit of an idea, a solution to a problem, or an aesthetic work. Often these judgments of value are based on the student's own values or opinions, so that these types of questions may also require students to offer an opinion on an issue or idea. To answer evaluation questions, students must apply objective criteria. These criteria may be supplied or may be devised by students based on research or on personal values. Some standard must be used. Differing standards are quite acceptable and they naturally result in different answers. This type of question frequently is used to surface values or to cause students to realize that not everyone sees things the same way. They can be used to start in-depth class discussions. They can also precede a follow-up analysis or synthesis question like, "Why?"

Distribution of Bloom's Taxonomy Levels by Subject and Grade in the **Exam***View*® *Learning Series*

Bloom's Taxonomy Level	Math	Reading	Science	Social Studies	Total Items
Knowledge	167	155	37	336	**695**
Comprehension	1,002	793	278	592	**2,665**
Application	2,832	700	949	378	**4,859**
Analysis	573	585	577	180	**1,915**
Synthesis	134	96	79	16	**325**
Evaluation	5	39	41	9	**94**
Total Items per Subject	**4,713**	**2,368**	**1,961**	**1,511**	**10,553**

Anderson, L.W., & Krathwohl (Eds.). 2001. *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. New York: Longman.

Bloom, B., Englehart, M. Furst, E., Hill, W., & Krathwohl, D. 1956. *Taxonomy of educational objectives: The classification of educational goals. Handbook I: Cognitive domain*. New York, Toronto: Longmans, Green.

Designed Instruction, LLC. 2006. "Complexity Leveling through Bloom's Taxonomy: Applicability of complexity levels assignments to stand-alone questions."