

Bloom's Taxonomy (Plus Two More!)

(adapted from *Designing Brain Compatible Learning*)

Benjamin Bloom's model, developed in the 1950s, is both enduring and useful as a way to model the enhancement of thinking. It is a developmental model in the sense that it focuses on thinking at ever greater levels of complexity. It helps us avoid simply making content more difficult and instead make it more complex.

KNOWLEDGE: Defined as the mere rote recall of previously learned material. All that is required is bringing it forth in the form in which it was learned. It represents the lowest level of learning in the cognitive domain since there is no presumption the learner understands what is being recalled.

COMPREHENSION: Describes the ability to make sense of the material. This may occur by converting the material from one form to another by summarizing or by estimating future trends. This learning goes beyond mere rote recall and represents the lowest level of understanding. When material is understood rather than just recalled, it is available for future use to solve problems and make decisions.

APPLICATION: Refers to the ability to use learned material in new situations with a minimum of direction. It includes the application of such things as rules, concepts, methods, and theories to solve problems. Convergent thinking is used to select, transfer, and apply data to a complete new task. Practice is essential at this level.

ANALYSIS: The ability to break material into its component parts so that its structure may be understood. It includes identifying parts, examining the relationships of the parts to each other and to the whole, and recognizing the organizational principles involved. The learner must be able to organize and reorganize in categories. This is a higher level because the learner is aware of the thought process in use.

SYNTHESIS: The ability to put parts together to form a plan that is new to the learner. It may involve the production of an essay or speech, a plan of operations, or a scheme for classifying information. This level stresses creativity with major emphasis on forming new patterns. This is the level where learners get an "Aha!" experience.

EVALUATION: At this level, learners have the ability to judge the value of material based on specific criteria. The learner may determine the criteria or be given them. The learner selects criteria that are the most relevant to the situation. Activities at this level almost always have multiple and equally acceptable solutions.

Bloom's Taxonomy and Corresponding Verbs

KNOWLEDGE LEVEL	Described Identified Listed Located	Labeled Defined Matched Named	Outlined Recalled Recorded Indicated
COMPREHENSION LEVEL	Explained Given examples Summarized Paraphrased	Classified Compared Contrasted Converted Interpreted	Differentiated Distinguished Estimated
APPLICATION LEVEL	Deduced Inferred Predicted Adapted Related	Solved Modified Practiced Prepared Examined	Utilized Illustrated Discovered Applied Completed Demonstrated
ANALYSIS LEVEL	Subdivided Classified Analyzed Organized	Dissected Categorized Proposed Specified	Summarized Diagrammed Deduced Discriminated
SYNTHESIS LEVEL	Induced Generalized Created Composed	Integrated Combined Planned Developed	Selected Constructed Generated Recommended
EVALUATION LEVEL	Judged Compared Contrasted Appraised Evaluated	Graded Supported Criticized Justified Ranked	Concluded Assessed Critiqued Determined Measured

NOTE: We seek to increase the COMPLEXITY, not the difficulty of tasks. For instance, "recall" can be quite difficult! The first two levels – Knowledge and Comprehension, are at levels where learners ACQUIRE information. At the Remaining four levels, they may EXTEND what they know.

SOURCES: Parry & Gregory (1998). *Designing Brain Compatible Learning*.

Major Categories in the Affective Domain

(Adapted from Krathwohl, 1964)

RECEIVING: Receiving refers to the learner's willingness to attend to particular phenomena or stimuli. This may range from simple awareness that a thing exists to selective attention on the part of the learner. Receiving represents the lowest level of learning outcomes in the affective domain.

RESPONDING: Responding refers to active participation. At this level the learner not only attends to a particular phenomenon but also reacts to it in some way. This may emphasize acquiescence in responding, willingness to respond, or satisfaction in responding. The higher levels of this category include those objectives that stress the seeking out and enjoyment of particular activities.

VALUING: Valuing is concerned with the worth or value a student attaches to a particular object, phenomenon, or behavior. This ranges from the more simple acceptance of a value to the more complex level of commitment. Valuing is based on the internalization of a set of specified values, but clues to these values are expressed in overt behavior. Learning in this area is concerned with behavior that is consistent and stable enough to make the value clearly identifiable.

ORGANIZATION: Organization is concerned with bringing together different values, resolving conflicts between them, and beginning the building of an internally consistent value system. Thus, the emphasis is on comparing, relating, and synthesizing values. Learning in this area may be concerned with the conceptualization of a value or with the organization of a value system. Developing a philosophy of life would fall into this category.

CHARACTERIZATION BY A VALUE OR VALUE COMPLEX: At this level of the affective domain the individual has a value system that has controlled his or her behavior for a sufficiently long time for him or her to have developed a characteristic "life-style". Thus the behavior is pervasive, consistent, and predictable. Learning at this level covers a broad range of activities, but the major emphasis is on the fact that the behavior is typical or characteristic of the person.

Corresponding Verbs in the Affective Domain

RECEIVING LEVEL	<ul style="list-style-type: none"> ➤ Asked ➤ Chosen ➤ Described ➤ Followed 	<ul style="list-style-type: none"> ➤ Given ➤ Held ➤ Identified ➤ Located 	<ul style="list-style-type: none"> ➤ Named ➤ Pointed to ➤ Replied ➤ Selected
RESPONDING LEVEL	<ul style="list-style-type: none"> ➤ Answered ➤ Assisted ➤ Complied ➤ Conformed ➤ Discussed 	<ul style="list-style-type: none"> ➤ Greeted ➤ Helped ➤ Labeled ➤ Performed ➤ Practiced 	<ul style="list-style-type: none"> ➤ Presented ➤ Recited ➤ Reported ➤ Told ➤ Written
VALUING LEVEL	<ul style="list-style-type: none"> ➤ Completed ➤ Differentiated ➤ Explained ➤ Followed ➤ Justified 	<ul style="list-style-type: none"> ➤ Described ➤ Formed ➤ Initiated ➤ Invited ➤ Joined 	<ul style="list-style-type: none"> ➤ Proposed ➤ Read ➤ Reported ➤ Shared ➤ Studied
ORGANIZATION LEVEL	<ul style="list-style-type: none"> ➤ Adhered ➤ Altered ➤ Arranged ➤ Combined ➤ Compared 	<ul style="list-style-type: none"> ➤ Completed ➤ Defended ➤ Explained ➤ Generalized ➤ Identified 	<ul style="list-style-type: none"> ➤ Integrated ➤ Modified ➤ Organized ➤ Related ➤ Synthesized
CHARACTERIZATION BY A VALUE OR VALUE COMPLEX	<ul style="list-style-type: none"> ➤ Acted ➤ Discriminated ➤ Displayed ➤ Influenced ➤ Listened 	<ul style="list-style-type: none"> ➤ Modified ➤ Performed ➤ Practiced ➤ Proposed ➤ Qualified 	<ul style="list-style-type: none"> ➤ Questioned ➤ Revised ➤ Served ➤ Solved ➤ Verified

Major Categories in the Psychomotor Domain (Adapted from Krathwohl, 1964)

PERCEPTION: The first level is concerned with the use of the sense organs to obtain cues that guide motor activity. This category ranges from sensory stimulation through cue selection, to translation. For example moving from awareness of a stimulus to selecting task-relevant cues to relating the cue perception to action in a performance.

SET: Set refers to readiness to take a particular type of action. This category includes mental readiness to act, physical readiness to act and willingness to act. Perception of cues serves as an important prerequisite for this level.

GUIDED RESPONSE: Guided response is concerned with the early stages in learning a complex skill. It includes imitation and trial and error. Adequacy of performance is judged by a suitable set of criteria.

MECHANISM: Mechanism is concerned with performance acts where the learned responses have become habitual and movements can be performed with some confidence and proficiency. Learning is concerned with performance skills of various types, but the movement patterns are less complex than at the next higher level.

COMPLEX OVERT RESPONSE: Complex overt response is concerned with the skillful performance of motor acts that involve complex movement patterns. Proficiency is indicated by a quick, smooth, accurate performance, requiring a minimum of energy. This category includes resolution of uncertainty (performs without hesitation) and automatic performance (movements are made with ease and good muscle control). Learning at this level includes highly coordinated motor activities.

ADAPTATION: Adaptation is concerned with skills that are so well developed that the individual can modify movement patterns to fit special requirements or to meet a problem situation.

ORIGINATION: Origination refers to the creating of new movement patterns to fit a particular situation or specific problem. Learning at this level emphasizes creativity based on highly developed skills.

Corresponding Verbs in the Psychomotor Domain

PERCEPTION LEVEL	<ul style="list-style-type: none"> ➤ Chosen ➤ Described ➤ Detected ➤ Differentiated 	<ul style="list-style-type: none"> ➤ Distinguished ➤ Identified ➤ Isolated 	<ul style="list-style-type: none"> ➤ Related ➤ Selected ➤ Separated
SET LEVEL	<ul style="list-style-type: none"> ➤ Began ➤ Displayed ➤ Explained ➤ Moved 	<ul style="list-style-type: none"> ➤ Proceeded ➤ Reacted ➤ Responded 	<ul style="list-style-type: none"> ➤ Started ➤ Volunteered ➤ Shown
GUIDED RESPONSE LEVEL	<ul style="list-style-type: none"> ➤ Assembled ➤ Built ➤ Calibrated ➤ Constructed ➤ Dismantled 	<ul style="list-style-type: none"> ➤ Displayed ➤ Dissected ➤ Fastened ➤ Fixed ➤ Sketched 	<ul style="list-style-type: none"> ➤ Heated ➤ Manipulated ➤ Measured ➤ Mended ➤ Mixed
MECHANISM LEVEL	➤ Same as above	➤	➤
COMPLEX OVERT RESPONSE LEVEL	➤ Same as above	➤	➤
ADAPTATION LEVEL	<ul style="list-style-type: none"> ➤ Adapted ➤ Altered ➤ Changed 	<ul style="list-style-type: none"> ➤ Rearranged ➤ Reorganized 	<ul style="list-style-type: none"> ➤ Revised ➤ Varied
ORIGINATION LEVEL	<ul style="list-style-type: none"> ➤ Arranged ➤ Combined 	<ul style="list-style-type: none"> ➤ Composed ➤ Constructed 	<ul style="list-style-type: none"> ➤ Designed ➤ Originated

More Action Verbs!

Described	Constructed	Interviewed
Lifted	Walked off	Danced
Reconstructed	Tasted	Adjusted
Painted	Critiqued	Built
Prepared	Prioritized	Itemized
Cooked	Numbered	Sorted
Established	Extended	Amplified
Advocated	Argued	Debated
Asked	Labeled	Balanced
Summed up	Ignited	Advised
Estimated	Measured	Composed
Revealed	Selected	Judged
Voted	Revised	Gathered
Calculated	Posted	Timed
Formulated	Appraised	Persuaded
Diagrammed	Collected	Shared
Rewritten	Blended	Outlined
Averaged	Inspected	Combined
Highlighted	Distributed	Compared
Chosen	Named	Modified
Inspected	Taste-tested	Baked
Eliminated	Rearranged	Substituted
Installed	Printed	Projected
Inserted	Weighed	Reported
Typed	Cast	Scavenged
Reversed	Stitched	Collated
Arranged	Displayed	Decorated