

# The “New Bloom's Taxonomy,” Objectives, and Assessments

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## I. Overview

This document provides a review of the latest revision of the venerable “Bloom's Taxonomy,” which combines aspects of the original taxonomy published by Bloom, Engelhart, Furst, Hill, and Krathwohl in 1956 with more recent taxonomy and framework research by others such as Merrill, Ausubel, Gagné, Romizowski, etc. David Krathwohl, one of the original contributing authors to Bloom's Taxonomy, was one of the two editors of the new version, published in *A Taxonomy for Learning, Teaching, and Assessing* in 2001. Unfortunately, when this revision was begun Benjamin Bloom was in advanced stages of Alzheimer's disease and unable to participate in the project. He died before the revision was published.

This document overviews the revised taxonomy in terms of types of objectives and learning activities, and particularly assessments, and where they fall in the two-dimensional taxonomy. A short review of other possible taxonomies or frameworks and comparable tools for selection of activities or assessments is also included.

## II. Learning Objectives

What is meant by "levels" or "complexities" of learning objectives? Anderson, Krathwohl, et. al have updated the classic "Bloom's Taxonomy" to incorporate advances in learning theory and practice since its inception, and offer the following two-dimensional framework to describe learning objectives:

	<i>Remember</i>	<i>Understand</i>	<i>Apply</i>	<i>Analyze</i>	<i>Evaluate</i>	<i>Create</i>
<i>Fact</i>	Remember Facts	Understand Facts	Apply Facts	Analyze using Facts, Concepts, Principles and Procedures	Evaluate using Facts, Concepts, Principles and Procedures	Create using Facts, Concepts, Principles and Procedures
<i>Concept/ Principle</i>	Remember Concepts	Understand Concepts	Apply Concepts			
<i>Procedure</i>	Remember Procedures	Understand Procedures	Apply Procedures			
<i>Metacognitive</i>	Remember Metacog. Strategies	Understand Metacog. Strategies	Apply Metacog. Strategies	Analyze Meta. Strategies	Evaluate Metacog. Strategies	Create Metacog. Strategies
	<i>Knowledge</i>		<i>Skill</i>	<i>Ability</i>		

This two-dimensional framework distinguishes between the type of knowledge being learned (e.g. Fact, Concept, Principle, Procedure, Metacognitive), and the type of

cognitive process being employed (Remember, Understand, Apply, Analyze, Evaluate, or Create). The horizontal dimension of cognitive process aligns with the original Bloom's Taxonomy categories, rewritten to active tense verb forms. (Evaluate and Create, formerly Synthesis and Evaluation, have also changed places to reflect meta-analysis the authors performed on various empirical studies of Bloom's Taxonomy in the intervening years.) The vertical dimension of type of knowledge aligns with other frameworks e.g. from the work of David Merrill or Ruth Clark.

In the left-most three columns, there is a strong correlation between the cognitive process and the type of knowledge content, as indicated by the shaded blocks. That is, most often we expect learners to remember facts, understand concepts, and apply procedures, though it is also possible to create learning objectives in the other cells, e.g. Apply Concepts. In the rightmost three columns, generally multiple types of knowledge content are employed in each of these more complex cognitive processes. Along the bottom we have also added another set of terms often used to characterize these objectives: knowledge, skill, and ability.

### **III. Learning Activities**

Our intent, whether developing classroom-based instructor-led training, online training, or a blend of the two, is to include a rich environment of activities which promote learning and help our learners feel engaged with the content. However, we also want to ensure that the activities, including assessments, match with the objectives specified for the learning. To facilitate this, we provide a framework in which to define how the various activities apply to learning objectives of different types, based on the Anderson/Krathwohl revision of Bloom's. The activity types which we have identified include:

- Informational Documents
- Organizational Aids
- Diagrammatic Activities (e.g. flowcharts, information mapping)
- Discussions
- Collaborative Activities
- Authentic Practice
- Presentations
- Job Aids
- Demonstrations
- Drill/Practice
- Modeling

These learning activities are suitable to support different levels or complexities of learning objectives, as defined above in the revised Bloom's Taxonomy. Once we have used the two-dimensional taxonomy to classify learning objectives, we can then offer

instruction designers and course developers tools with which to select appropriate learning activities, including assessments, to match the type of learning objective.

With this in mind, we can see that we might present the following types of activities to support these areas of the Taxonomy:

	<i>Remember</i>	<i>Understand</i>	<i>Apply</i>	<i>Analyze</i>	<i>Evaluate</i>	<i>Create</i>
<b><i>Fact</i></b>	Presentation Informational Document Drill/Practice	Presentation Informational Document	Presentation			
<b><i>Concept/ Principle</i></b>	Presentation Informational Document Drill/Practice	Presentation Informational Document Organizational Aid Diagrammatic Activity Discussion Collaboration	Presentation Organizational Aid Diagrammatic Activity Discussion Authentic Practice	Presentation Diagrammatic Activity Discussion Collaboration Authentic Practice	Presentation Discussion Collaboration Authentic Practice Job Aids Modeling	Presentation Collaboration Authentic Practice Modeling
<b><i>Procedure</i></b>	Presentation Informational Document Job Aids	Presentation Informational Document Organizational Aid Discussion Collaboration Job Aids	Presentation Organizational Aid Discussion Collaboration Authentic Practice Job Aids Modeling	Job Aids Modeling		

#### **IV. Assessment Strategy**

The taxonomy described above also applies directly to the realm of assessment. The following types of assessment activities have been identified:

Multiple Choice (Recall, Interpretations, Summaries, predictions, Best Answer, etc.)	Lab: Low-Inference Interactive video/simulation	Performance Differentiation interlineal set
Matching (concepts, cause & effect, etc.)	Instrumented lab Visual observation/rating	Knowledge mapping Problem-solving item set
Sequencing	Item set FIB	Discussion (formative)
Multiple True/False	Project	Essay (rated on use of principles, procedures, etc.)
Short Answer Essay	Instrument-aided observation	Review/critique
Comprehension Item Set	Anecdotal (formative)	Constructed Response
Interlineal Item Set	Demonstration with rating scale/checklist	Self-assessment (formative)
Pictorial Item Set	Exhibition	

Lab: High-Inference

The items above are not presented in any particular order. They would be matched to the taxonomy as follows:

	<i>Remember</i>	<i>Understand</i>	<i>Apply</i>	<i>Analyze</i>	<i>Evaluate</i>	<i>Create</i>
<b>Fact</b>	Multiple Choice e.g. Recall definitions as taught	M/C M-T/F M/C - Interpretation short-answer essay	m/c - Apply memorized facts to simple authentic situations	m/c - best answer lab: high inference differentiation interlineal set knowledge mapping	m/c: best answer discussion (formative) essay (rated on use of principles) essay (rated on use of procedures) review/critique	constructed response exhibition portfolio
<b>Concept/ Principle</b>	matching recall order e.g. concept, category, principle definitions	match cause-effect m/c predict using principles comprehension item set choose best (new) definition match classification m/c - examples and non-ex. m/c - summaries	lab: high-inference pictorial item set Apply concepts to solve an authentic problem	problem-solving item set		

	<i>Remember</i>	<i>Understand</i>	<i>Apply</i>	<i>Analyze</i>	<i>Evaluate</i>	<i>Create</i>
<i>Procedure</i>	recall steps of procedures recall sequencing	interlineal item set	lab: low-inference interactive video/simulation instrumented lab visual observation/rating item set FIB project pictorial item set instrument-aided observation anecdotal (formative) demonstration with rating scale/checklist exhibition performance			