

Bloom's Taxonomy of Cognition

([Revised Version](#), Anderson and Krathwohl, 2002)

Bloom's taxonomy, an ordering or classification of cognitive skills, was developed in the 1950s and designed to provide a common language that would enable instructors to discuss student learning and share assessment strategies.

In 2001, the original taxonomy was revised so that cognitive processes (remembering, understanding, etc.) are presented as verbs. The revision also incorporated new findings in psychological and educational research.

Higher Order Thinking Skills

- **Creating**
- **Evaluating**
- **Analyzing**
- **Applying**
- **Understanding**
- **Remembering**



Lower Order Thinking Skills

Level of Cognition	Description
Creating	Putting elements together to construct a novel and coherent whole
Evaluating	Making judgements based upon standards and criteria
Analyzing	Breaking material into constituent parts and investigating relationships
Applying	Using information to carry out a procedure in a novel situation
Understanding	Constructing meaning from learning activities and materials
Remembering	Retrieving relevant knowledge from long-term memory

Verbs Associated with Bloom's Taxonomy of Cognition

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Bloom's Taxonomy serves as a useful prompt for thinking about course design and program competencies. Courses or programs that aim to foster deep learning approaches, (e.g., application of critical thinking and problem-solving skills to core disciplinary concepts) incorporate into their curriculum learning activities and assessments that address higher levels of cognition (analyzing, evaluating, and creating). The strength of Bloom's Taxonomy is its ability to point to misalignment of course learning objectives and program competencies, and at the course level, misalignment of learning objectives with assessments and learning activities.

The verbs associated with each of Bloom's six levels of cognition (remembering, understanding, applying, analyzing, evaluating, and creating) are presented, below, from higher level to lower order thinking. These verbs are often useful prompts when writing strong learning objectives.

Creating	Evaluating	Analyzing	Applying	Understanding	Remembering
<i>Putting elements together to construct a novel and coherent whole</i>	<i>Making judgements based upon standards and criteria</i>	<i>Breaking material into constituent parts and investigating relationships</i>	<i>Using information to carry out a procedure in a novel situation</i>	<i>Constructing meaning from learning activities and materials</i>	<i>Retrieving relevant knowledge from long-term memory</i>
Assemble	Appraise	Analyze	Adapt	Associate	Articulate
Combine	Argue	Categorize	Apply	Characterize	Copy
Compile	Assay	Compare	Ascertain	Cite	Count
Compose	Assess	Contrast	Calculate	Clarify	Define
Construct	Conclude	Correlate	Compute	Classify	Duplicate
Create	Consider	Deconstruct	Derive	Convert	Enumerate
Cultivate	Convince	Detect	Determine	Describe	Find
Design	Critique	Diagram	Draw	Detail	Identify
Develop	Debate	Diagnose	Employ	Discover	Label
Devise	Defend	Differentiate	Establish	Distinguish	List
Formulate	Discriminate	Ensure	Execute	Elaborate	Match
Generate	Evaluate	Examine	Experiment	Estimate	Name
Hypothesize	Gauge	Infer	Explore	Explain	Order
Invent	Judge	Inspect	Expose	Express	Outline
Plan	Justify	Integrate	Illustrate	Group	Quote
Produce	Measure	Investigate	Implement	Indicate	Recall
Propose	Monitor	Manage	Manipulate	Interpret	Recite
Reconstruct	Rate	Model	Modify	Locate	Recognize
Revise	Recommend	Organize	Plot	Paraphrase	Repeat
Specify	Reflect	Prioritize	Practice	Restate	Reproduce
Structure	Reframe	Query	Project	Select	Retrieve
Synthesize	Score	Relate	Provide	Show	State
-	Validate	Survey	Solve	Summarize	Tabulate
-	Verify	Test	Use	Trace	Visualize

Activities & Assessments Associated with Bloom's Taxonomy of Cognition

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The learning activities and assessments presented here are a derivative of [Bloom's Taxonomy Learning Activities and Assessments](#). [Centre for Teaching Excellence, University of Waterloo](#), used under [CC BY-NC 4.0](#) by BSPH Center for Teaching and Learning.

Level of Cognition	Learning Activities	Assessments
Creating	<ul style="list-style-type: none"> • Brainstorm • Decision-making tasks • Develop and describe new solutions or plans • Performances • Presentations • Research projects • Written assignment 	<ul style="list-style-type: none"> • Develop criteria to evaluate product or solution • Grant proposal • Outline alternative solutions • Research proposal
Evaluating	<ul style="list-style-type: none"> • Debates • Compare and contrast (with charts, tables, Venn diagrams) • Concept map • Journal • Pros and cons list • Mind map • Review paper 	<ul style="list-style-type: none"> • Argumentative or persuasive essay • Debates • Discussions • Presentation • Provide alternative solutions • Report
Analyzing	<ul style="list-style-type: none"> • Case studies • Compare and contrast (with charts, tables, Venn diagram) • Concept map • Debates • Discussions • Flowchart • Graph • Group investigation • Mind map • Questionnaires • Report/survey • Think-pair-share 	<ul style="list-style-type: none"> • Analysis paper • Case studies • Evaluation criteria • Critique hypothesis, procedures etc. • Muddiest point • One-minute paper • Research paper • Review paper

Level of Cognition	Learning Activities	Assessments
Applying	<ul style="list-style-type: none"> • Calculate • Case studies • Concept map • Creating examples • Demonstrations • Flipped classrooms • Gallery walk • Gamification • Group work • Lab experiments • Map • Prezi • Problem-solving tasks • Short answers • Role play 	<ul style="list-style-type: none"> • Discussion board post • E-portfolio • Lab reports • One-minute paper • Presentation • Problem-solving tasks • Short answers • Tests
Understanding	<ul style="list-style-type: none"> • Case studies • Concept map • Demonstrations • Diagrams • Flowcharts • Gamification • Group discussions • Lightboard • Mind map • Matrix activity • Play/sketches • Summarize • Think-pair-share 	<ul style="list-style-type: none"> • Concept map • Create a summary • Essay • Diagrams • Infographics • Matrix activity • One-minute paper • Presentation • Provide examples • Quizzes • Short answers
Remembering	<ul style="list-style-type: none"> • Flashcards • Highlight key words • List • Memory activities • Reading materials • Watching presentations and videos 	<ul style="list-style-type: none"> • Clicker questions • Fill-in-the blanks • Label • Match • Multiple choice • Quizzes • True and false questions