In 1956, Benjamin Bloom headed a group of educational psychologists who developed a classification of levels of intellectual behavior important in learning. Bloom found that over 95% of the test questions students encounter require them to think only at the lowest possible level...the recall of information.

Bloom identified six levels within the cognitive domain, from the simple recall or recognition of facts, as the lowest level, through increasingly more complex and abstract mental levels, to the highest order which is classified as evaluation. Verb examples that represent intellectual activity on each level are listed below.

**Evaluation**

Present and defend opinions by making judgments about information, validity of ideas or quality of work based on a set of criteria

- Judgments in terms of internal evidence
- Judgments in terms of external criteria
making value decisions about issues;
resolving controversies or differences of opinion;
development of opinions, judgments or decisions

- Do you agree...?
- What do you think about...?
- What is the most important...?
- Place the following in order of priority...
- How would you decide about...?
- What criteria would you use to assess...?

Action Verbs: assess, decide, rank, grade, test, measure, recommend, convince, select, judge, explain, discriminate, support, conclude, compare, summarize, appraise, argue, attach, defend, choose, predict, rate, core, value, evaluate, defend estimate.

Synthesis
Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions

- Production of a unique communication
- Production of a plan, or proposed set of operations
- Derivation of a set of abstract relations

- creating a unique, original product that may be in verbal form or may be a physical object;
- combination of ideas to form a new whole
  - What would you predict/infer from...?
  - What ideas can you add to...?
  - How would you create/design a new...?
  - What might happen if you combined...?
  - What solutions would you suggest for...?

Action Verbs: combine, integrate, modify, rearrange, substitute, plan, create, design, invent, compose, formulate, prepare, generalize, rewrite, arrange, assemble, collect, construct, develop, manage, organize, propose, set up, and write.

Analysis
Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations

- Analysis of elements
- Analysis of relationships
• Analysis of organizational principles
  o subdividing something to show how it is put together;
  o finding the underlying structure of a communication;
  o identifying motives;
  o separation of a whole into component parts
    ▪ What are the parts or features of...?
    ▪ Classify...according to...
    ▪ Outline/diagram...
    ▪ How does...compare/contrast with...?
    ▪ What evidence can you list for...?

**Action Verbs:** analyze, separate, order, explain, connect, classify, arrange, divide, compare, select, infer, appraise, calculate, categorize, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, and test.

**Application**
Using new knowledge. Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way

  o **problem solving**;
  o **applying information to produce some result**;
  o **use of facts, rules and principles**
    ▪ How is...an example of...?
    ▪ How is...related to...?
    ▪ Why is...significant?

**Action Verbs:** apply, demonstrate, calculate, complete, illustrate, show, solve, examine, modify, relate, change, classify, experiment, discover, choose, dramatize, employ, interpret, operate, practice, schedule, sketch, solve, use, write.

**Understanding/Comprehension**
Demonstrative understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas

  • Translation
  • Interpretation
  • Extrapolation

  o interpreting;
  o translating from one medium to another;
  o describing in one's own words;
  o organization and selection of facts and ideas
    ▪ Retell...
**Action Verbs:** summarize, describe, interpret, contrast, predict, associate, distinguish, estimate, differentiate, discuss, extend, classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, and translate,

**Knowledge**

Exhibit memory of previously-learned materials by recalling facts, terms, basic concepts and answers

- Knowledge of specifics - terminology, specific facts
- Knowledge of ways and means of dealing with specifics - conventions, trends and sequences, classifications and categories, criteria, methodology
- Knowledge of the universals and abstractions in a field - principles and generalizations, theories and structures

  - remembering;
  - memorizing;
  - recognizing;
  - recalling identification and
  - recall of information
    - Who, what, when, where, how...?
    - Describe

**Action Verbs:** list, define, tell, describe, identify, show, label, collect, examine, tabulate, arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce, state, quote, who, when, and where.
Creative Thinking
Creative thinking involves creating something new or original. It involves the skills of flexibility, originality, fluency, elaboration, brainstorming, modification, imagery, associative thinking, attribute listing, metaphorical thinking, and forced relationships. The aim of creative thinking is to stimulate curiosity and promote divergence.

While critical thinking can be thought of as more left-brain and creative thinking more right brain, they both involve "thinking." When we talk about HOTS "higher-order thinking skills" we're concentrating on the top three levels of Bloom's Taxonomy: analysis, synthesis, and evaluation.

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>describe</th>
<th>identify</th>
<th>list</th>
<th>show</th>
<th>tell</th>
<th>tabulate</th>
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<td>collect</td>
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<td>define</td>
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<td>state</td>
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<td>enumerate</td>
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<td>read</td>
<td>record</td>
<td>reproduce</td>
<td>copy</td>
<td>select</td>
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</tbody>
</table>
Examples: dates, events, places, vocabulary, key ideas, parts of diagram, 5Ws

Comprehension
associate compare distinguish extend interpret predict differentiate
contrast describe discuss estimate group summarize order
cite convert explain paraphrase restate trace
Examples: find meaning, transfer, interpret facts, to infer cause & consequence, examples

Application
apply classify change illustrate solve demonstrate
calculate complete solve modify show experiment
relate discover act administer articulate chart
collect compute construct determine develop establish
prepare produce report teach transfer use
Examples: use information in new situations, solve problems

Analysis
analyze arrange connect divide infer separate
classify compare contrast explain select order
breakdown correlate diagram discriminate focus illustrate
infer outline prioritize subdivide points out prioritize
Examples: recognize and explain patterns and meaning, see parts and wholes

Synthesis
combine compose generalize modify invent plan substitute
create formulate integrate rearrange design speculate rewrite
adapt anticipate collaborate compile devise express facilitate
reinforce structure substitute intervene negotiate reorganize validate
Examples: discuss "what if" situations, create new ideas, predict and draw conclusions

Evaluation
assess compare decide discriminate measure rank test
convince conclude explain grade judge summarize support
appraise criticize defend persuade justify reframe
Examples: make recommendations, assess value and make choices, critique ideas

Affective Domain
Domain Attributes: interpersonal relations, emotions, attitudes, appreciations, and values
accepts attempts challenges defends disputes joins judges
contributes praises questions shares supports volunteers