# A Model of Learning Objectives

based on

## *A Taxonomy for Learning, Teaching, and Assessing:*
## *A Revision of Bloom's Taxonomy of Educational Objectives*

Among other modifications, Anderson and Krathwohl's (2001) revision of the original Bloom's taxonomy (Bloom & Krathwohl, 1956) redefines the cognitive domain as the intersection of the Cognitive Process Dimension and the Knowledge Dimension. This document offers a three-dimensional representation of the revised taxonomy of the cognitive domain.

Although the Cognitive Process and Knowledge dimensions are represented as hierarchical steps, the distinctions between categories are not always clear-cut. For example, all procedural knowledge is not necessarily more abstract than all conceptual knowledge; and an objective that involves analyzing or evaluating may require thinking skills that are no less complex than one that involves creating. It is generally understood, nonetheless, that lower order thinking skills are subsumed by, and provide the foundation for higher order thinking skills.

## The Knowledge Dimension classifies four types of knowledge that learners may be expected to acquire or construct—ranging from concrete to abstract (Table 1).

**Table 1. The Knowledge Dimension – major types and subtypes**

| concrete knowledge ⟶ | | | abstract knowledge |
|---|---|---|---|
| **factual** | **conceptual** | **procedural** | **metacognitive*** |
| knowledge of terminology<br><br>knowledge of specific details and elements | knowledge of classifications and categories<br><br>knowledge of principles and generalizations<br><br>knowledge of theories, models, and structures | knowledge of subject-specific skills and algorithms<br><br>knowledge of subject-specific techniques and methods<br><br>knowledge of criteria for determining when to use appropriate procedures | strategic knowledge<br><br>knowledge about cognitive tasks, including appropriate contextual and conditional knowledge<br><br>self-knowledge |

(Table 1 adapted from Anderson and Krathwohl, 2001, p. 46.)

*Metacognitive knowledge is a special case. In this model, "metacognitive knowledge is knowledge of [one's own] cognition and about oneself in relation to various subject matters . . ." (Anderson and Krathwohl, 2001, p. 44).

This taxonomy provides a framework for determining and clarifying learning **objectives**.
Learning **activities** often involve both lower order and higher order thinking skills as well as a mix of concrete and abstract knowledge.

## The Cognitive Process Dimension represents a continuum of increasing cognitive complexity—from lower order thinking skills to higher order thinking skills. Anderson and Krathwohl (2001) identify nineteen specific cognitive processes that further clarify the scope of the six categories (Table 2).

**Table 2. The Cognitive Processes dimension — categories & cognitive processes** and alternative names

| lower order thinking skills ⟶ | | | | higher order thinking skills | |
|---|---|---|---|---|---|
| **remember** | **understand** | **apply** | **analyze** | **evaluate** | **create** |
| recognizing<br>• identifying<br>recalling<br>• retrieving | interpreting<br>• clarifying<br>• paraphrasing<br>• representing<br>• translating<br>exemplifying<br>• illustrating<br>• instantiating<br>classifying<br>• categorizing<br>• subsuming<br>summarizing<br>• abstracting<br>• generalizing<br>inferring<br>• concluding<br>• extrapolating<br>• interpolating<br>• predicting<br>comparing<br>• contrasting<br>• mapping<br>• matching<br>explaining<br>• constructing models | executing<br>• carrying out<br>implementing<br>• using | differentiating<br>• discriminating<br>• distinguishing<br>• focusing<br>• selecting<br>organizing<br>• finding coherence<br>• integrating<br>• outlining<br>• parsing<br>• structuring<br>attributing<br>• deconstructing | checking<br>• coordinating<br>• detecting<br>• monitoring<br>• testing<br>critiquing<br>• judging | generating<br>• hypothesizing<br>planning<br>• designing<br>producing<br>• constructing |

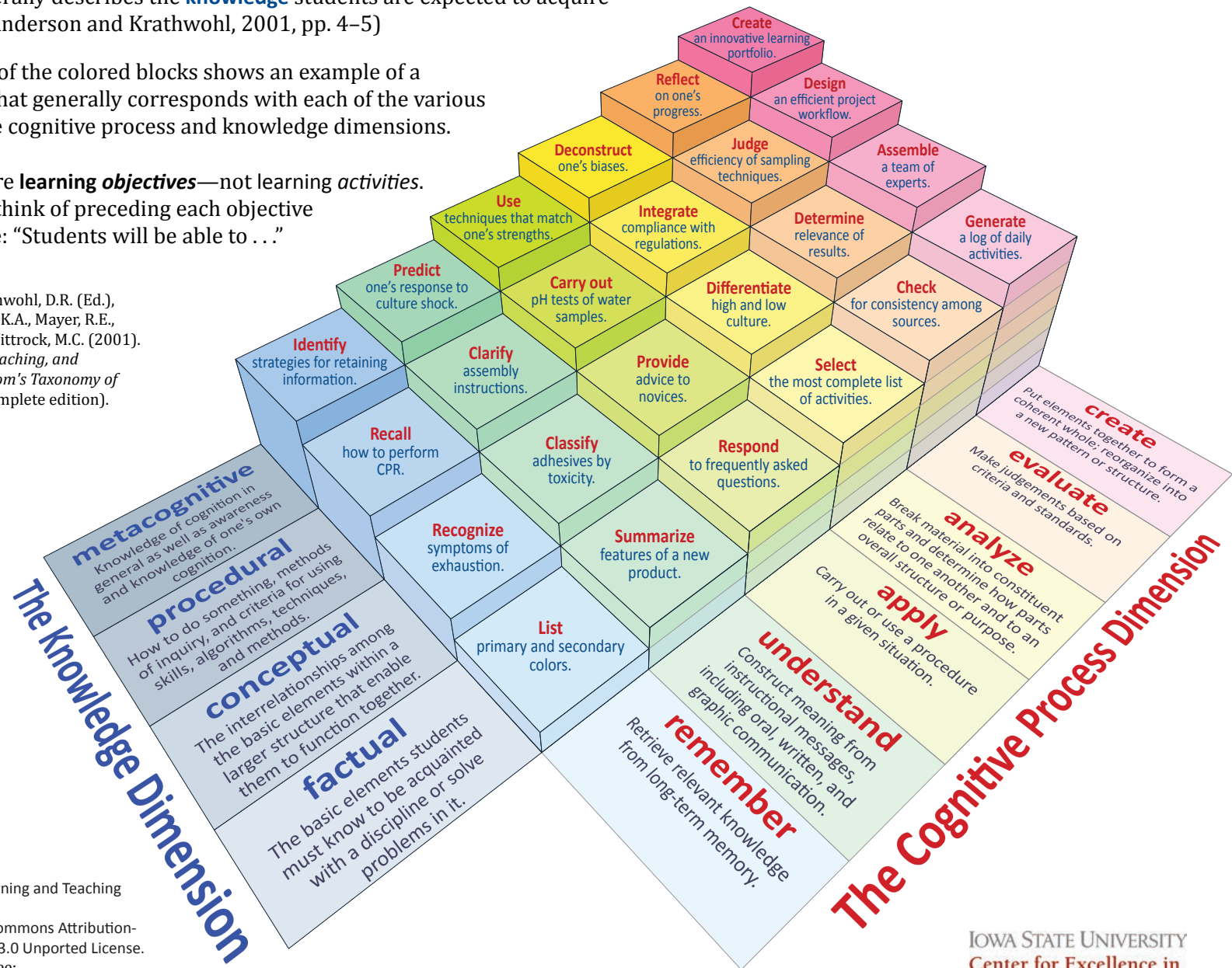(Table 2 adapted from Anderson and Krathwohl, 2001, pp. 67–68.)

A statement of a **learning objective** contains a **verb** (an action) and an **object** (usually a noun).

- The **verb** generally refers to [actions associated with] the intended **cognitive process**.

- The **object** generally describes the **knowledge** students are expected to acquire or construct. (Anderson and Krathwohl, 2001, pp. 4–5)

In this model, each of the colored blocks shows an example of a learning objective that generally corresponds with each of the various combinations of the cognitive process and knowledge dimensions.

**Remember:** these are **learning** *objectives*—not learning *activities*. It may be useful to think of preceding each objective with something like: "Students will be able to . . ."

*Anderson, L.W. (Ed.), Krathwohl, D.R. (Ed.), Airasian, P.W., Cruikshank, K.A., Mayer, R.E., Pintrich, P.R., Raths, J., & Wittrock, M.C. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's Taxonomy of Educational Objectives* (Complete edition). New York: Longman.

**The Knowledge Dimension**

**metacognitive**
Knowledge of cognition in general as well as awareness and knowledge of one's own cognition.

**procedural**
How to do something, methods of inquiry, and criteria for using skills, algorithms, techniques, and methods.

**conceptual**
The interrelationships among the basic elements within a larger structure that enable them to function together.

**factual**
The basic elements students must know to be acquainted with a discipline or solve problems in it.

**The Cognitive Process Dimension**

**remember**
Retrieve relevant knowledge from long-term memory.

**understand**
Construct meaning from instructional messages, including oral, written, and graphic communication.

**apply**
Carry out or use a procedure in a given situation.

**analyze**
Break material into constituent parts and determine how parts relate to one another and to an overall structure or purpose.

**evaluate**
Make judgements based on criteria and standards.

**create**
Put elements together to form a coherent whole; reorganize into a new pattern or structure.

Learning objective blocks:

- **Create** an innovative learning portfolio.
- **Reflect** on one's progress.
- **Design** an efficient project workflow.
- **Deconstruct** one's biases.
- **Judge** efficiency of sampling techniques.
- **Assemble** a team of experts.
- **Use** techniques that match one's strengths.
- **Integrate** compliance with regulations.
- **Determine** relevance of results.
- **Generate** a log of daily activities.
- **Predict** one's response to culture shock.
- **Carry out** pH tests of water samples.
- **Differentiate** high and low culture.
- **Check** for consistency among sources.
- **Identify** strategies for retaining information.
- **Clarify** assembly instructions.
- **Provide** advice to novices.
- **Select** the most complete list of activities.
- **Recall** how to perform CPR.
- **Classify** adhesives by toxicity.
- **Respond** to frequently asked questions.
- **Recognize** symptoms of exhaustion.
- **Summarize** features of a new product.
- **List** primary and secondary colors.

Model created by: Rex Heer
Iowa State University
Center for Excellence in Learning and Teaching
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For additional resources, see:
www.celt.iastate.edu/teaching/RevisedBlooms1.html

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