

WRITING LEARNING OUTCOMES

Learning outcome statements describe knowledge, skill, or dispositions that we intend students to gain or develop as a result of their participation in our courses and programs. A well-written outcome statement describes desired student behavior.

The Cognitive domain involves knowledge and the development of intellectual skills. This includes the recall or recognition of specific facts, procedural patterns, and concepts that serve in the development of intellectual abilities and skills. There are six major categories, which are listed in order below, starting from the simplest behavior to the most complex. The categories can be thought of as degrees of difficulties. That is, the first one must be mastered before the next one can take place.

If you want to see if students KNOW the material, consider these verbs:	define, repeat, list, name, label, ask, observe, memorize, record, recall, fill in, listen, match, recite, select, draw
If you want to know if students UNDERSTAND , try these verbs:	restate, describe, explain, tell, identify, discuss, recognize, review, express, locate, report, estimate, distinguish, paraphrase, document, defend, generalize
If you are interested in a student's ability to APPLY learning, consider	change, compute, demonstrate, show, operate, use, solve, sequence, test, classify, translate, employ, construct, dramatize, illustrate, interpret, manipulate, write
If you want to assess student ability to ANALYZE , these are helpful verbs:	dissect, differentiate, calculate, contrast, debate, solve, appraise, experiment, diagram, inventory, relate, map, categorize, defend
If the student's ability to EVALUATE is your interest, consider these verbs:	compare, conclude, criticize, justify, support, state, discriminate, summarize, recommend, rate, decide, select
If you want to explore students' preparation to "pull it all together" or to SYNTHESIZE , here are some verbs to consider:	create, compose, propose, formulate, set up, assemble, construct, manage, invent, produce, hypothesize, plan, design, organize, prepare, speculate

EXAMPLES:

Student will be able to:

Describe how population data can be analyzed using statistics, graphs, life tables, and survivorship curves.

Discuss how cultural reality is constantly renewed in daily life through cultural subsystems such as symbols and sites of memory/history, such as buildings, places, landscapes, historical figures, popular heroes, culture-specific products, literary and artistic canons, fashion, cuisine, etc.

Apply energy, momentum, continuity, state and constitutive equations to thermal, fluids and mechanical systems in a logical and discerning manner.

Explain by words and equations the factors affecting the rate of a chemical reaction, including temperature.

Design, implement and evaluate a computer-based system, process, component, or program to meet desired needs.

Compare practical solutions for mechanical engineering problems under professional and ethical constraints.

Demonstrate a variety of proof techniques including direct proof, proof by contradiction and proof by induction.

Represent electromagnetic phenomena and fields mathematically in specific situations and contexts.

Write in an engaging and coherent style appropriate to the conventions of the discipline and the nature of the work

The Affective domain includes the manner in which we deal with things emotionally, such as feelings, values, appreciation, motivations and attitudes.

<p>If you want to see if students are DEVELOPING AN AWARENESS, willingness to hear, or selected attention, Try these verbs:</p>	<p>asks, chooses, describes, follows, gives, holds, identifies, locates, names, points to, selects, sits, erects, replies, uses.</p>
<p>If you want to see if students have a WILLINGNESS TO ENGAGE (motivation), consider these verbs:</p>	<p>answers, assists, aids, complies, conforms, discusses, greets, helps, labels, performs, practices, presents, reads, recites, reports, selects, tells, writes.</p>
<p>If you want to understand the WORTH OR VALUE A STUDENT ATTACHES TO A PARTICULAR OBJECTS, PHENOMENON OR BEHAVIOR, try these verbs: This ranges from simple acceptance to the more complex state of commitment. Valuing is based on the internalization of a set of specified values, while clues to these values are expressed in the learner's overt behavior and are often identifiable.</p>	<p>completes, demonstrates, differentiates, explains, follows, forms, initiates, invites, joins, justifies, proposes, reads, reports, selects, shares, studies, works.</p>
<p>If you want to understand the extent to which students can ORGANIZE VALUES INTO PRIORITIES (e.g., by contrasting different values, resolving conflicts between them, and/or creating a unique value system)</p>	<p>adheres, alters, arranges, combines, compares, completes, defends, explains, formulates, generalizes, identifies, integrates, modifies, orders, organizes, prepares, relates, synthesizes.</p>
<p>If you are interested in students ability to INTERNALIZE A VALUE SYSTEM THAT GUIDES THEIR BEHAVIOR (e.g., behavior is pervasive, consistent, predictable, and most importantly, characteristic of the learner), try these verbs:</p>	<p>discriminates, displays, influences, listens, modifies, performs, practices, proposes, qualifies, questions, revises, serves, solves, verifies.</p>

EXAMPLES:

Students will be able to:

Demonstrates belief in the democratic process. Is sensitive towards individual and cultural differences.

Shows the ability to solve problems. Proposes a plan to improve process or product and follows through with commitment.

Shows self-reliance when working independently.

Cooperates in group activities. Uses an objective approach in problem solving.

Displays a professional commitment to ethical practice on a daily basis.

Revises judgments and changes behavior in light of new evidence.