

## Continuing Education Program Guide to Writing Learning Objectives

### ***Instructional guide to writing good [great] learning objectives***

Objectives used in the NERC Continuing Education Program (CE Program), whether you refer to objectives as learning objectives, behavioral objectives, instructional objectives, or performance objectives, they are all terms that refer to description of observable student behavior or performance that are used to make judgments about learning. It is important, therefore, that we learn to write good objectives. In the CE Program, we refer to all objectives as learning objectives. Every learning activity submitted under the CE Program must have a set of well constructed learning objectives related to the curriculum, not the instruction. This is a key point. Many tend to confuse learning objectives with the objectives an instructor may have that relate to student conduct or behavior in the classroom.

Many trainers mistakenly write [learning activity] goals instead of objectives. A goal is a statement of intended general outcome of an instructional unit or program. A goal statement describes a more global learning outcome. A goal statement may also be considered what the instructor desires to accomplish in delivering the learning activity. A learning objective is a statement of one of several specific performances, the achievement of which contributes to the attainment of the goal. A single goal may have specific subordinate learning objectives.

Properly constructed learning objectives should leave little doubt about what is intended. A well constructed learning objective describes an intended learning outcome and contains three parts, each of which alone mean nothing, but when combined into a sentence or two communicates the conditions under which the behavior is performed, a verb that defines the behavior itself, and the degree [criteria] to which a student must perform the behavior. If any one of these three components is missing, the objective cannot communicate accurately. The three parts of a learning objective are:

1. **Conditions:** A statement that describes the conditions under which the behavior is to be performed. This should include what tools or assistance is to be provided, or what other aids will be provided or denied.
  - **Learning objective:** “Given a set of data the student will be able to [correctly] compute a balancing authority’s area control error (ACE).”
  - **Condition is:** “Given a set of data.”
2. **Behavior [behavioral verb]:** An action word that connotes an observable student behavior. This is the competency to be learned in performance terms. The choice of a verb is all-important here. Such frequently used terms as know, understand, grasp, and appreciate do not meet this requirement. If the verb used in stating an objective identifies an observable student behavior, then the basis for a clear statement is established. In addition, the type or level of learning must be identified. (see [Types of Learning and Their Levels](#))
  - **Learning objective:** “Given a set of data the student will be able to [correctly] compute a balancing authority’s area control error (ACE).”
  - **Behavior is:** “The student will be able to compute the balancing authority’s area control error (ACE).”

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3. **Criterion:** A statement that specifies how well the student must perform the behavior. This can be accomplished with a statement indicating the degree of accuracy, a quantity or proportion of correct responses, or the like. The criterion can be implied.
- **Learning objective:** “Given a set of data the student will be able to [correctly] compute a balancing authority’s area control error (ACE).”
  - **Criterion:** “The number [implied] computed (ACE)” will be correct.”

A learning objective is the focal point of each learning activity. It is a description of an intended learning outcome and is the basis for the rest of the learning activity. It provides criteria for constructing an **assessment** for the learning activity, as well as for the instructional procedures the instructor designs to implement the learning activity. Without an objective that clearly communicates specific student behavior or performance, it is difficult, if not impossible, to determine exactly what a particular learning activity is supposed to accomplish.

In order to write learning objectives, you should begin with an understanding of the particular content to which the objectives will relate. Understanding in more than one way the content to be learned should be a goal of instructors as well as students. This implies that instructors or others who prepare objectives as part of lesson plans or curriculum documents and guides should have more than superficial knowledge of the appropriate content. Writing a series of objectives that are within a body of content, but which have neither internal nor external consistency with that body of content, is not a productive use of time. However, the purpose of this is not to delve into the area of curriculum consistency, but rather present pointers that will help trainers write better objectives. So, with that in mind, let's begin.

## Conditions

The condition part of an objective specifies the circumstances, commands, materials and/or, directions that the student will be given to initiate the behavior. All behavior relevant to intended student learning outcomes can best be understood within a context of the conditions under which the behavior is to be performed or demonstrated. The condition part of an objective usually begins with a simple declarative statement such as:

- “Upon request the student will”
- “Given (some physical objective) the student will”
- “At the conclusion of this activity the student can”

You notice that in these examples there is no mention of the description of the instruction that precedes the initiation of the behavior. The instruction that leads to the behavior should never be included in the actual objective. Condition statements can generally be considered as either aiding or limiting. An aiding condition advises the student of things that will be available to assist in the performance of a specified action. For example: “*Given a single line diagram,*” the student will list each bus-tie breaker [or switches] on bus A.

A limiting condition advises the student of limitations which are likely to make the action more difficult to perform. For example: “*Without the use of a legend,*” the student will list all of the motor-operated switches on the 230 kV buses at City Substation.

Instruction that leads students to accomplishing an objective is a separate issue. Here, we want to concentrate on describing only the conditions under which the desired student behavior is to be performed.

## Verbs

You all learned in school that a verb is an action word. In a learning objective, the verb is also an action word, but it is also a special kind of action word. The verb in a learning objective is an action word that connotes an observable behavior. For example, although we trainers all want

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our students to appreciate one thing or another, it is impossible to determine when a student “appreciates” something. Understand is another noble word that connotes something we want our students to do, but we cannot see “understanding.” The best we can do is make inferences that a student appreciates or understands something based on what the student does or says in a controlled situation.

What is a behavioral verb then? It’s quite simple. A behavioral verb is a word that denotes an observable action, or the creation of an observable product. Verbs such as identify, name, and describe are behavioral because you can observe the act or product of identifying, naming, or describing. Some verbs are embedded in a phrase that gives them a specific behavioral meaning. Examples are state a rule and apply a rule. In this case the behavior is contextual, and the context is the rule in question. (See the [Table of Verbs for formulating learning objectives](#) for a partial list of verbs.)

## **Criterion**

The criteria part of a learning objective is a declarative statement that describes how well the behavior must be performed to satisfy the intent of the behavioral verb. Usually, criteria are expressed in some minimum number, or as what must be, as a minimum, included in a student response. For example, an objective might be of the form: “Given a list of the bus voltages from all 230 kV substations arranged in ascending order,” (*conditions*) the student will identify (*verb*) all voltage values that are at or below 0.96 per units (*criteria*.)” Notice that the objective does not specify how the student will convert voltages into per units. The objective implies that the student has the knowledge or skill [ability] needed to make the per unit conversions. The objective also does not state how the student will list the voltage values. The student could circle or highlight the correct voltage values using a yellow marker pen.

## **Putting it all together**

Well-written learning objectives are the heart of any lesson plan. If the objectives you compose are “fuzzy” and difficult, if not impossible to assess, the rest of the lesson plan you create based on those objectives is likely to be flawed. Before you begin to write an objective, spend a little time thinking about what you are describing, and remember to make sure the student behavior is observable. You will find this process helps you clarify what you intend, and you will be better able to communicate that intent to your students, regardless of their experience level or knowledge of the subject matter.

Any time you write a learning objective, ask yourself the question: “Does this objective clearly communicate and describe the intended learning outcome?” If you can find exceptions or loopholes as a way of meeting the objective, then the objective should be rewritten. Learning to write learning objectives that describe what you want takes **patience and practice**. Make sure you get as much feedback as possible about your efforts. To help you I have included a section that lists several action verbs and their meaning (see [List of verbs and their definitions](#)). You should refer to this list when you are writing learning objectives for your learning activities.

## **Checklist for writing a specific learning objective**

1. Begin each statement of a specific learning outcome with a verb that specifies definite, observable behavior.
2. Make sure that each statement meets all three of the criteria for a good learning objective: observable behavior, the conditions under which the student will be expected to perform, and the criteria to be used for an assessment of the student’s performance.

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3. Be sure to include complex objectives (appreciation, problem-solving, etc.,) only when they are appropriate.

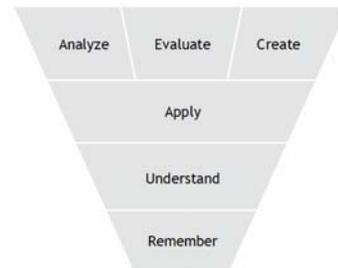
## ***Types of Learning and their Levels***

Bloom's Taxonomy is a way to classify instructional activities or questions as they progress in difficulty. The lower levels require less in the way of thinking skills. As one moves down the hierarchy, the activity requires higher level thinking skills.

Level	Type of Activity or Question	Verbs used for Objectives
<b>Lowest Level</b>	Knowledge	define, memorize, repeat, record, list, recall, name, relate, collect, label, specify, cite, enumerate, tell, recount
	Comprehension	restate, summarize, discuss, describe, recognize, explain, express, identify, locate, report, retell, review, translate
	Application	exhibit, solve, interview, simulate, apply, employ, use, demonstrate, dramatize, practice, illustrate, operate, calculate, show, experiment
<b>Higher Levels</b>	Analysis	interpret, classify, analyze, arrange, differentiate, group, compare, organize, contrast, examine, scrutinize, survey, categorize, dissect, probe, inventory, investigate, question, discover, text, inquire, distinguish, detect, diagram, inspect
	Synthesis	compose, setup, plan, prepare, propose, imagine, produce, hypothesize, invent, incorporate, develop, generalize, design, originate, formulate, predict, arrange, contrive, assemble, concoct, construct, systematize, create
	Evaluation	judge, assess, decide, measure, appraise, estimate, evaluate, infer, rate, deduce, compare, score, value, predict, revise, choose, conclude, recommend, select, determine, criticize

Benjamin Bloom proposed his Taxonomy in 1956. Bloom's Taxonomy divided education objectives into three domains:

- Affective
- Psychomotor
- Cognitive.



Within each domain are different levels of learning, with higher levels considered more complex and closer to complete mastery of the subject matter. A goal of Bloom's Taxonomy is to motivate educators to focus on all three domains, creating a more holistic form of education.

## ***Affective Domain***

Skills in the affective domain describe the way people react emotionally and their ability to feel another living thing's pain or joy. Affective objectives typically target the awareness and growth in attitudes, emotion, and feelings.

There are five levels in the affective domain moving through the lowest order processes to the highest:

1. **Receiving** - The lowest level; the student passively pays attention. Without this level no learning can occur.
2. **Responding** - The student actively participates in the learning process, not only attends to a stimulus, the student also reacts in some way.

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3. **Valuing** - The student attaches a value to an object, phenomenon, or piece of information.
4. **Organizing** - Students can put together different values, information, and ideas and accommodate them within their own schema; comparing, relating and elaborating on what has been learnt.
5. **Characterizing** - The student has held a particular value or belief that now exerts influence on their behavior so that it becomes a characteristic.

## ***Psychomotor Domain***

Skills in the psychomotor domain describe the ability to physically manipulate a tool or instrument like a hand or a hammer. Psychomotor objectives usually focus on change and/or development in behavior and/or skills.

Bloom and his colleagues never created subcategories for skills in the psychomotor domain, but since then other educators have created their own psychomotor taxonomies.

## ***Cognitive Domain***

Skills in the cognitive domain revolve around knowledge, comprehension, and “thinking through” a particular topic. Traditional education tends to emphasize the skills in this domain, particularly the lower-order objectives.

There are six levels in the taxonomy, moving through the lowest order processes to the highest:

1. **Knowledge** - Exhibit memory of previously-learned materials by recalling facts, terms, basic concepts and answers:
  - Knowledge of specifics, such as: terminology, specific facts
  - Knowledge of ways and means of dealing with specifics, such as: conventions, trends and sequences, classifications and categories, criteria, methodology
  - Knowledge of the universals and abstractions in a field, such as: principles and generalizations, theories and structures

Questions like: What is...?

2. **Comprehension** - Demonstrative understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas:
  - Translation
  - Interpretation
  - Extrapolation

Questions like: How would you compare and contrast...?

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

Questions like: Can you organize \_\_\_\_\_ to show...?

4. **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

Questions like: How would you classify...?

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5. **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 relationsQuestions like: Can you predict an outcome?
6. **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

## ***List of verbs and their definitions:***

**APPLY A RULE:** To state a rule as it applies to a situation, object, or event that is being analyzed. The statement must convey analysis of a problem situation and/or its solution, together with the name or statement of the rule that was applied.

**ASSESS:** To stipulate the conditions by which the behavior specified in an objective may be ascertained. Such stipulations are usually in the form of written descriptions. For obvious reasons, assess is rarely used as a verb in learning objectives at the elementary school level.

**CLASSIFY:** To place objects, words, or situations into categories according to defined criteria for each category. The criteria must be made known to the student.

**COMPOSE:** To formulate a composition in written, spoken, musical, or artistic form.

**CONSTRUCT:** To make a drawing, structure, or model that identifies a designated object or set of conditions.

**DEFINE:** To stipulate the requirements for inclusion of an object, word, or situation in a category or class. Elements of one or both of the following must be included: (1) The characteristics of the words, objects, or situations that are included in the class or category. (2) The characteristics of the words, objects, or situations that are excluded in the class or category. To define is to set up criteria for classification.

**DEMONSTRATE:** The student performs the operations necessary for the application of an instrument, model, device, or implement. **NOTE:** There is a temptation to use demonstrate in objectives such as, "the student will demonstrate his knowledge of vowel sounds." As the verb is defined, this is an improper use of it.

**DESCRIBE:** To name all of the necessary categories of objects, object properties, or event properties that are relevant to the description of a designated situation. The objective is of the form, "The student will describe this order, object, or event" and does not limit the categories that may be used in mentioning them. Specific or categorical limitations, if any, are to be given in the performance standards of each objective. When using this verb in an objective, it is helpful to include a statement to the effect of what the description, as a minimum, must reference.

**DIAGRAM:** To construct a drawing with labels and with a specified organization or structure to demonstrate knowledge of that organization or structure. Graphic charting and mapping are types of diagramming, and these terms may be used where more exact communication of the structure of the situation and response is desired.

**DISTINGUISH:** To identify under conditions when only two contrasting identifications are involved for each response.

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**ESTIMATE:** To assess the dimension of an object, series of objects, event or condition without applying a standard scale or measuring device. Logical techniques of estimation, such as are involved in mathematical interpolation, may be used. See MEASURE.

**EVALUATE:** To classify objects, situations, people, conditions, etc., according to defined criteria of quality. Indication of quality must be given in the defined criteria of each class category. Evaluation differs from general classification only in this respect.

**IDENTIFY:** To indicate the selection of an object of a class in response to its class name, by pointing, picking up, underlining, marking, or other responses.

**INTERPRET:** To translate information from observation, charts, tables, graphs, and written material in a verifiable manner.

**LABEL:** To stipulate a verbal (oral or written) response to a given object, drawing, or composition that contains information relative to the known, but unspecified structure of these objects, drawings, or compositions. Labeling is a complex behavior that contains elements of naming and identifying.

**LOCATE:** To stipulate the position of an object, place, or event in relation to other specified objects, places, or events. Ideational guides to location such as grids, order arrangements, and time may be used to describe location. Note: Locate is not to be confused with IDENTIFY.

**MEASURE:** To apply a standard scale or measuring device to an object, series of objects, events, or conditions, according to practices accepted by those who are skilled in the use of the device or scale.

**NAME:** To supply the correct name, in oral or written form for an object, class of objects, persons, places, conditions, or events which are pointed out or described.

**ORDER:** To arrange two or more objects or events in accordance with stated criteria.

**PREDICT:** To use a rule or principle to predict an outcome or to infer some consequence. It is not necessary that the rule or principle be stated.

**REPRODUCE:** To imitate or copy an action, construction, or object that is presented.

**SOLVE:** To effect a solution to a given problem, in writing or orally. The problem solution must contain all the elements required for the requested solution, and may contain extraneous elements that are not required for solution. The problem must be posed in such a way that the student is able to determine the type of response that is acceptable.

**STATE A RULE:** To make a statement that conveys the meaning of the rule, theory, or principle.

**TRANSLATE:** To transcribe one symbolic form to another of the same or similar meaning.

## **Table of Verbs for Formulating Learning Objectives**

*These verbs communicate knowledge:*

### **Information:**

Cite	Identify	Quote	Relate	Tell
Count	Indicate	Read	Repeat	Trace
Define	List	Recite	Select	Write
Describe	Name	Recognize	State	
Draw	Point	Record	Tabulate	

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## Comprehension:

Associate	Describe	Explain	Locate	Translate
Classify	Differentiate	Express	Predict	
Compare	Discuss	Extrapolate	Report	
Compute	Distinguish	Interpolate	Restate	
Contrast	Estimate	Interpret	Review	

## Application:

Apply	Employ	Locate	Relate	Sketch
Calculate	Examine	Operate	Report	Solve
Complete	Illustrate	Order	Restate	Translate
Demonstrate	Interpolate	Practice	Review	Use
Dramatize	Interpret	Predict	Schedule	Utilize

## Analysis:

Analyze	Debate	Distinguish	Inventory	Appraise
Detect	Experiment	Question	Contract	Diagram
Infer	Separate	Criticize	Differentiate	Inspect
Summarize				

## Synthesis:

Arrange	Construct	Formulate	Organize	Produce
Assemble	Create	Generalize	Plan	Propose
Collect	Design	Integrate	Prepare	Specify
Compose	Detect	Manage	Prescribe	

## Evaluation:

Appraise	Determine	Judge	Recommend	Test
Assess	Estimate	Measure	Revise	
Choose	Evaluate	Rank	Score	
Critique	Grade	Rate	Select	

## These Verbs Impact Skills:

Diagnose	Integrate	Measure	Project	Empathize
Internalize	Palpate	Visualize	Hold	Massage
Pass				

## These Verbs Convey Attitudes:

Acquire	Exemplify	Realize	Reflect	
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## These Verbs are Better Avoided – Fuzzy Interpretations:

Appreciate	Have faith in	Know	Learn	Understand
Believe	Cover	Study	Comprehend	

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## ***The Good, the Bad, and the Ugly [learning objectives]***

I have gathered some examples of learning objectives that I have received in applications. I have altered part of these so as not to identify anyone. However, the intent of these learning objectives has not changed. As you read this list, try to apply what you have learned from this document to see: 1) the major faults with each objective, 2) the missing conditions under which the behavior is to be performed, and then see how you would rewrite these objectives into good, clear, and concise learning objectives.

### ***The Bad and the Ugly:***

1. Use the generic [EPRI] OTS to solve various simulations.
2. Students will explain the basic operation of the protective relays in the system.
3. Students will recognize when the system goes from a steady-state to a system collapse.
4. Students will demonstrate restoration techniques for the transmission and generation networks from blackout and islanded situations.
5. Demonstrate the ability to restore the regional system after a total system collapse.
6. Students will be provided an understanding of the events that could lead to a declaration of a system emergency, which will require this level of coordination between all parties involved.
7. Students will gain knowledge on the operation of the energy market within the region and the associated tool interactions.
8. Identify the events that trigger the scheme.
9. Demonstrate the proficiency in use of remote synchronizing equipment.
10. Define the procedure to use to recover from each scenario of initial conditions.