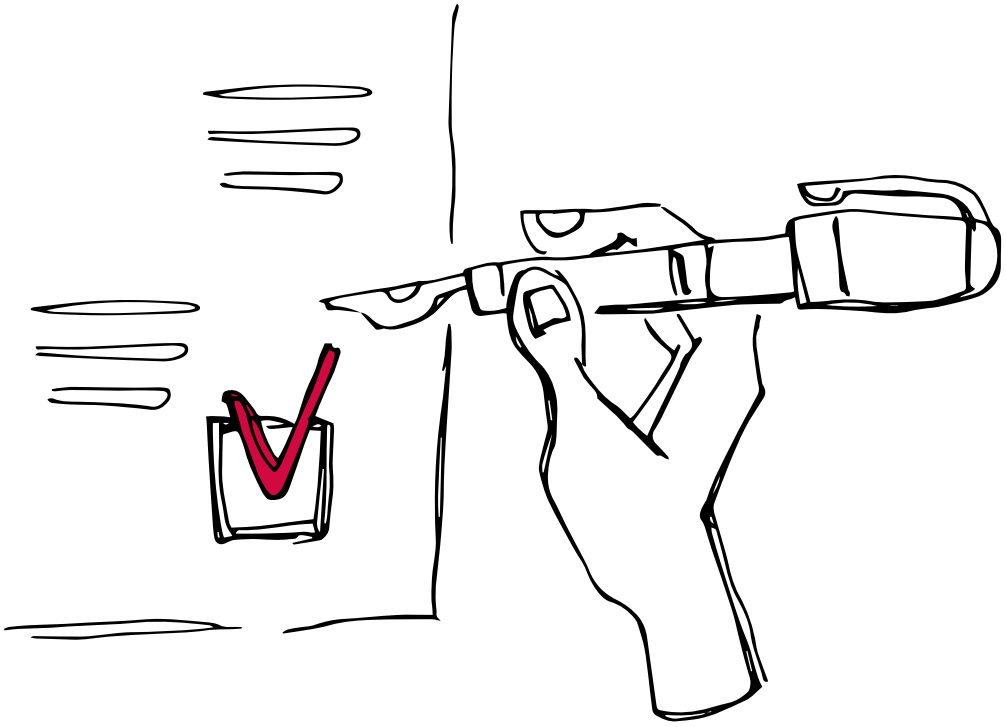


WHITE PAPER

Systematic Approach to Training: **Writing Learning Objectives**

HSI Industrial Skills — Reliability Matters

Well-written learning objectives are the foundation for effective training programs.

However, there's much more to successful training and job performance than simply writing good learning objectives. Your learning objectives should be created from the tasks you identified in your Job Task Analysis. Making sure you tie your tasks to training forms the basis for good technical training and for compliance if needed.

Effective learning objectives come from:

- Good Writing Construction
- Aligning Objectives

This white paper focuses on writing learning objectives, so it focuses on good writing construction.

What is a Learning Objective?

In 1956, Benjamin Bloom published his Taxonomy of Educational Objectives. However, learning objectives were brought to the attention of many educators in 1962 with the publication of Robert F. Mager's book, Preparing Instructional Objectives. During the 1960s and early 1970s, many public school teachers were required to write learning (behavioral) objectives as a critical component of their daily lesson plans.

Learning objectives have been around for a long time, so they're well established as a learning tool.

So, what is a learning objective? It is a statement that specifies measurable behavior a student should exhibit after training. **In other words, a learning objective states what the student is intended to learn when the training is finished.**

Developing effective training material depends on developing good learning objectives. It's important that learning objectives are developed and approved early since they form the foundation for your training delivery, your training content, your instructional materials, and your assessments.

Learning objectives go by other names such as behavioral objectives, outcomes, learning outcomes, educational objectives, performance objectives, and instructional objectives.

Learning objectives should always be specific and measurable.

A Systematic Approach to Training

For this white paper, we are using the **ADDIE model** for a systematic approach to training.

Analysis – typically, company-specific tasks are identified and the job task analysis is developed during the Analysis phase of the ADDIE model.

Design – learning objectives are written in this phase.

Development – content and instructional materials are developed in the third phase based on how learning objectives are written.

Implementation – training is delivered to the student in the implementation phase.

Evaluation – in this phase, the student's capability to perform the tasks are evaluated. Those assessments are based on how the learning objectives are written.

What are the benefits of defining and articulating well-designed learning objective statements?

- By identifying your training goal, you increase the chances of the student and the training reaching that goal. Both can easily focus on what's important in their actual workplace performance
- Learning objectives ensure training is performance-based. Everyone involved, from the manager, to the lead operator, to the instructor, to the students, is assured the training addresses actual business unit or organizational goals
- Learning objectives form the basis for sequencing and chunking content, making it easier for the learner to understand and retain the training content
- Learning objectives tell students what's important. They weed out the nice to know from the need to know. Students focus on the key deliverables, and what they need to know and do for their jobs
- Learning objectives enable good assessment development. They allow the training team to assess and check students for competency

When writing learning objectives, remember adults want to participate in relevant activities and know what's in it for them.

Having learning objectives and presenting them clearly helps make training relevant to your audience.

What is a Task/Job Task Analysis?

A job task analysis, or JTA, was previously mentioned as a good foundation for technical training. It's important to understand what is meant by a task and a JTA. A JTA is an important part of the training development process.

It determines specific knowledge and skill requirements by role. When developing a JTA, you review and update your job descriptions and identify specific skills required for each role.

Three Elements of a Learning Objective

Once the JTA is completed and you have a list of tasks, you are ready to write your learning objectives – translating your tasks into performance-based learning objectives. Make sure your learning objectives are student-centered and not focused on what the trainer or program will do, provide, or cover.

A well-written learning objective has three parts:

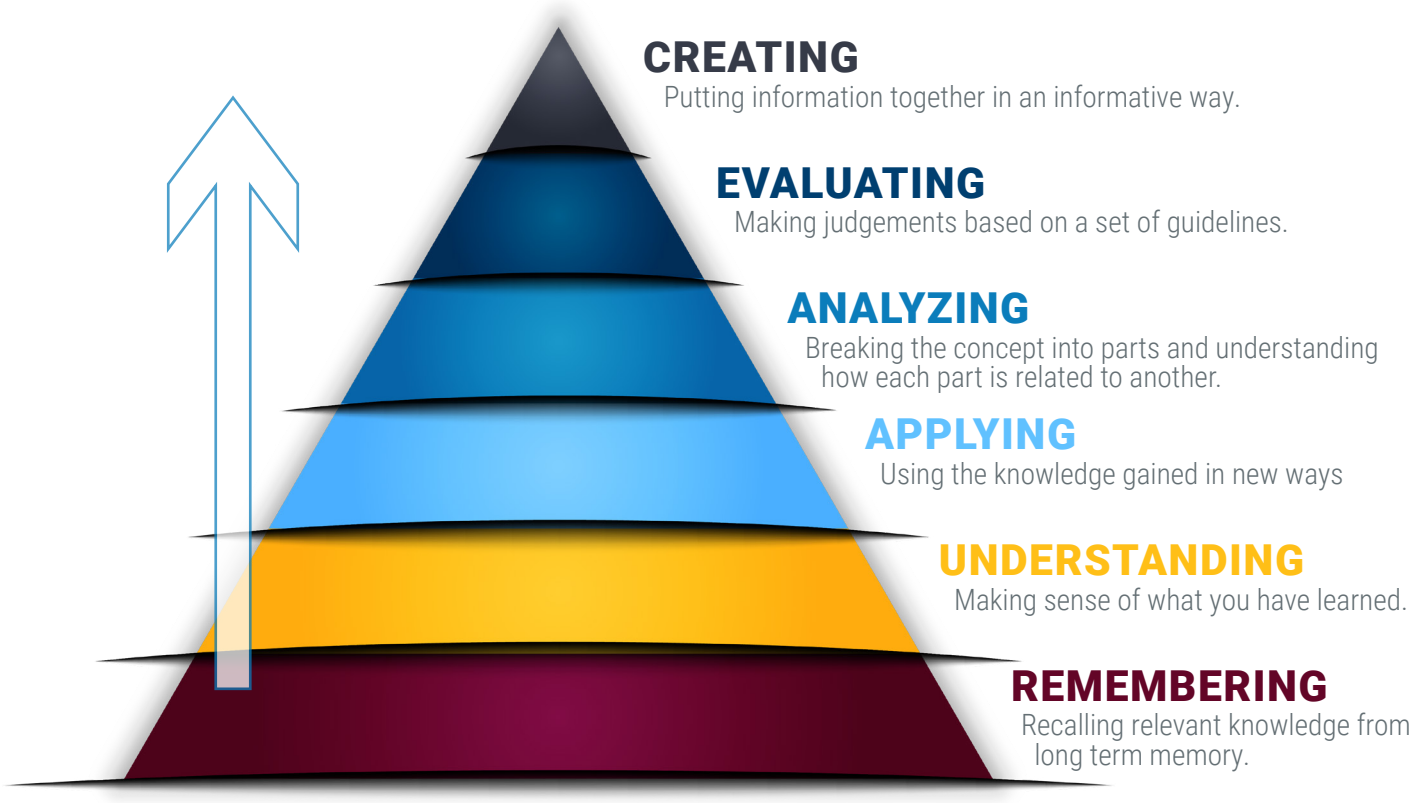
1. **Behavior** – observable action
2. **Conditions** – under what situation and/or tools the student will operate
3. **Standards** – performance level expected to perform the task

Learning Objective, Element No.1 – Behavior

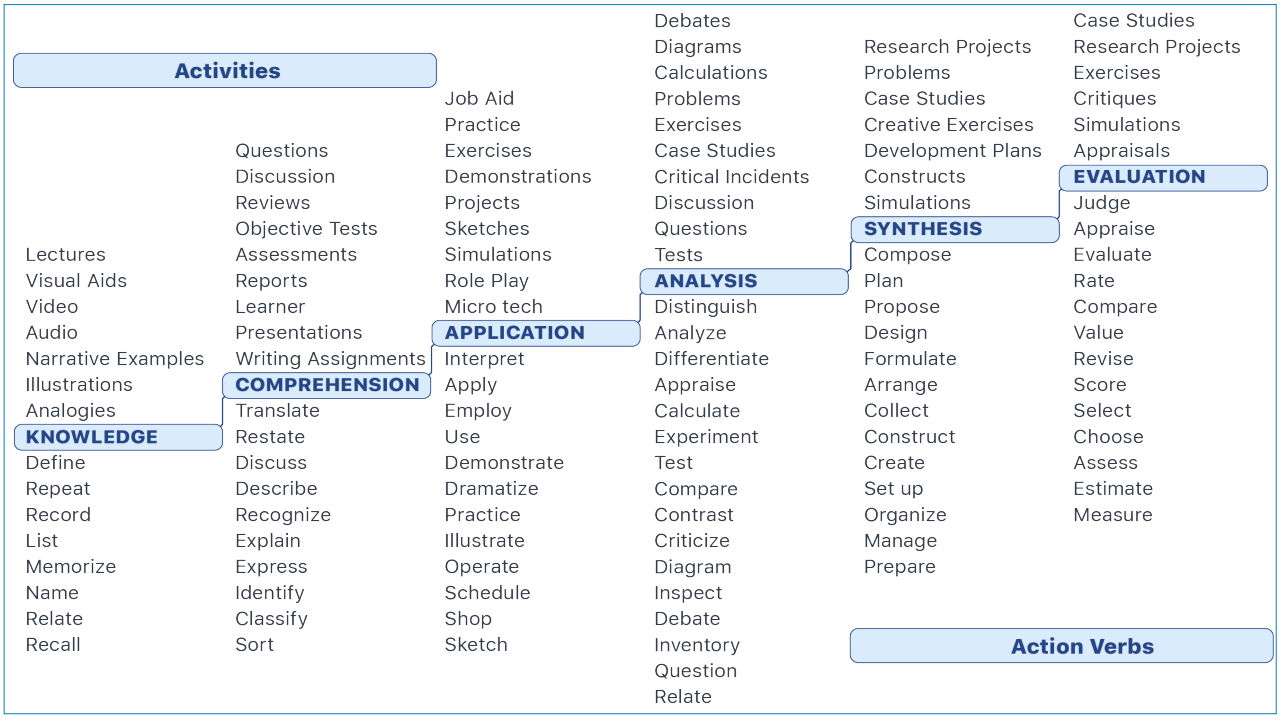
The first step in developing a learning objective is to determine the behavior or observable action which consists of an action verb and a direct object or what we referred to earlier as a task. The action verb coupled with the object should be observable and measurable. We recommend only one observable action or task in each learning objective.

Limiting a learning objective to one task or observable action makes it easier to measure.It is also important to make sure the learning objective verb is readily observed and measured. To determine the quality of your verb, ask yourself if you would know it if you saw someone doing it.

One way to pick effective verbs is to look at the additional level of learning and behavior you want from your training. The pyramid below shows Bloom's taxonomy or classification. Each of these levels has verbs and learning assessment suggestions associated with it which helps new workers build effective mental models and experienced workers build additional expertise.
The pyramid is one way to show how it works.



Suggested Instructional Strategies For Use With Each Level of Bloom's Taxonomy



Another way to look at the pyramid is as steps in an upward progression as shown above. The left side of the image starts with the lowest level verbs and each step moves upward in complexity. At the beginning, a student must be able to **know** and **recall** a concept at a fundamental level. Moving toward the right is comprehension, where the student must be able to **explain** the concept and possibly **discuss** it in some detail. Next is application, where the student may need to **practice** the concept. In analysis, the student may need to **distinguish** one concept from another. With synthesis, the student might **plan** or **manage** a concept as part of a scenario. Finally, at evaluation, the student might **judge** whether their action is working or possibly **choose** a different solution.

Examples of non-measurable verbs include:

- Appreciate
- Believe
- Know
- Learn
- Understand
- Monitor

Developing effective learning objectives includes avoiding weak or non-measurable verbs.

Using monitor as an example, ask yourself, *"What is the performance I want when people monitor a task?"* Often, the true goal is to recognize abnormal conditions, control the task within limits, or identify potential issues, all measurable verbs.

For example, your task is to drive a car. Your objective may be successfully identify a car's controls given an operator's manual. In this objective, **identify a car's controls** is your behavior.

Learning Objective, Element No.2 – Conditions

The next element in the learning objective is the conditions under which the task will occur and any tools or materials the student will use in performing the task. A well-written learning objective should clearly state the condition that exists at the time of the student's performance. **Conditions of performance** define the facility situation, environmental aspects, and resources or tools available to aid performance.

It is beneficial to identify task conditions and resources when conducting a JTA. This process helps when writing learning objectives – you've already gathered the information you need.

Typical conditions or tools include references, equipment, charts, graphs, spreadsheets, standard operating procedures, and problem situations.

Using our driving objective, **given an operator's manual** is the condition.

Learning Objective, Element No.3 – Standards

The last element for a well-written objective is the standard or performance level at which the student must perform the task. The student's action should result in an output, and the required quality or quantity of that output is the standard of performance.

Identifying the standard also helps ensure the training and its assessment is fair, consistent, and objective, providing:

- Reliable and valid training
- Perception of fairness, an important motivator in the workplace

Standards may change according to the course and job progression. For instance, new employees may be required to perform a learning objective *"as required."* This level would be the same for each person at that point to ensure reliability and validity. But as we look at the same task for experienced workers doing continuing training, the standard may be higher, such as *"accurately."*

Additional notes may be needed in the assessment instructions to clarify the standards and apply them consistently. This process is especially important with on-the-job training where a novice or new worker could potentially work with different people over time.

In the driving objective, **successfully** is the standard.

Let's apply the three elements to an example:

Task: Direct transmission switching.

Learning Objective: The student will be able to direct transmission switching, without error, given a set of data.

Behavior: Direct transmission switching

Condition: Given a set of data

Standard: Without error

Terminal and Enabling Objectives

Terminal objectives derive from the task statement. The previous example is a terminal objective. Enabling objectives derive from the knowledge and skills identified during your JTA.

> Enabling objectives are learning objectives that support the terminal objectives.

They include the critical components of performance, conditions, and standards. So, write them using the key knowledge, skills, and abilities required for performance.

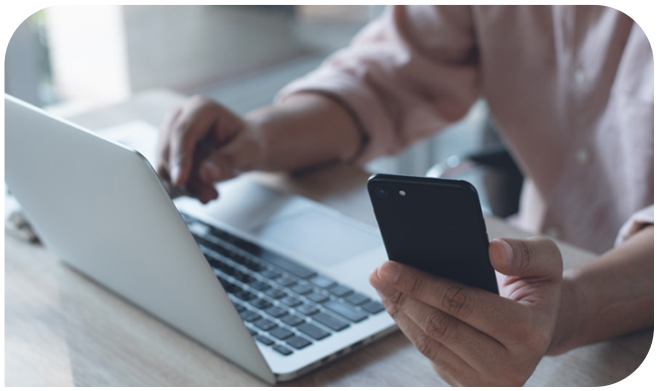
Enabling objectives should be **logically sequenced**, moving from simple to complex and from lower to higher levels of learning. Often, the required sequence will drive the outline and content of the lesson plan and other training material. Grouping and sequencing your objectives helps present content in a way the student can understand and make sense of.

Going back to our driving objective example, for a novice, one terminal learning objective might be to successfully identify the car's controls given an operator's manual. Your enabling objective could be correctly locate the seat levers, correctly identify the dashboard controls, correctly identify the foot pedals, and so on.

Both terminal and enabling objectives should be written with the three elements – behavior, conditions, and standard.

To write the best learning objectives, start with the end in mind. Identify what performance you want by the end of the training and write the terminal objective that will get the student to that performance. Then develop enabling objectives, which drill down to the knowledge, skills, and attributes the student needs to successfully perform the task.

Enabling objectives help you get to terminal objectives. In turn, terminal objectives help get your student to task or job performance.



Terminal objective example:

Task: Use the corporate phone system.

Learning Objective: The student will be able to correctly use the corporate phone system in accordance with company procedures.

Enabling Objectives:

Use During a phone call, the student will be able to correctly transfer the call as needed.

The student will be able to correctly initiate a conference call as needed.

There will almost always be more enabling objectives than terminal objectives, because the enabling objectives include everything the student needs to know and do to perform the behavior required to demonstrate the terminal objective. While there are only two enabling objectives listed in our example, you could easily come up with many more.

Four Skills for Competency

So far, we have focused on learning objectives as they measure performance on individual job tasks which is the foundation for training.

After the foundation piece is in place, the next step is to move down **the four skills** list:

1
Task Skills
Perform individual tasks

2
Task Management Skills
Manage many different tasks within the job

3
Contingency Management Skills
Respond to irregularities and breakdowns in routine

4
Environment Skills
Deal with the responsibilities and expectations of the work environment

The first item on the list includes the information we've already covered. However, **task management skills**, the second item, is the reality of the job. This skill is more than multi-tasking. It's often figuring out which task should be done, based on the situation and how things are behaving.

Contingency management skills include not only emergencies, but the unexpected. Finally, **environmental skills** involve a job's cultural aspects – the unwritten expectations about how things are done around here.

Learning objectives for these behavioral competencies help with most, if not all, tasks. However, they are much harder to write and more difficult to measure. Some organizations identify the technical competencies required for the job and the tasks to do the job. They also identify the behavioral competencies critical for success in all the tasks and the job.

The information below shows learning objectives that apply to the **competency of adaptive decision making.** Situation awareness is most often real time. Event analysis is a retrospective look at something significant that happened, so it's non-real time. Risk management can be applied either in real time or non-real time.

Situation Awareness

Given a scenario, describe the relevant awareness factors with 100% accuracy

During a given emergency condition, identify the appropriate procedure steps that apply with 100% accuracy

Event Analysis

During emergency conditions, apply just culture principles correctly

Given an event, recognize whether to apply best practice correctly to a particular situation

Risk Management

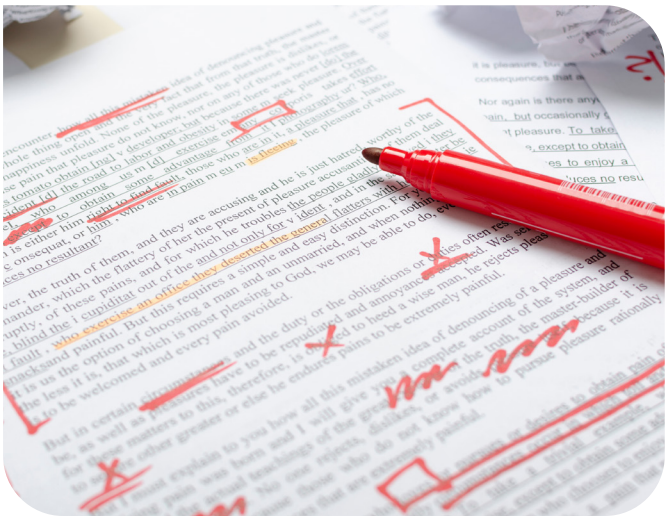
Given a scenario, identify decision risk using the appropriate criteria

After completing training, describe the business unit's risk criteria correctly

The draft learning objectives show how these competencies relate to many tasks. What's important is task performance alone is not enough to ensure the required level of job performance.

Learning and being able to perform these competencies is part of what bridges the gap between the capability to perform tasks and what it takes to do the job effectively.

While most people are aware of these competencies, few are writing them in training programs to the same level as they're writing their technical training.



Tying It Together

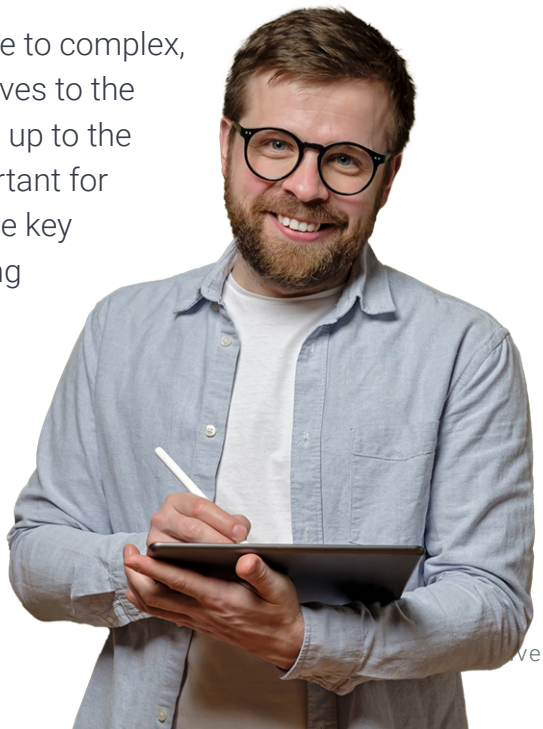
Once tasks are included in the training program, terminal objectives must be sequenced and organized into instructional areas. If your students are novices, the material can be overwhelming. You need to think about how to deliver it so it's easy to understand, retain, and recall when needed on the job.

Objectives are normally sequenced from simple to complex or known to unknown. If you're teaching knowledge, it could make more sense to sequence from concrete to abstract. However you sequence, you should allow each terminal objective to build upon and provide information necessary to support the next terminal objective within that instructional area. The objectives should be **sequenced in a logical progression** which considers the level of learning that must occur to build to the next objective. This practice ensures the entire training program is sequenced correctly.

> For example, if you're training on how to complete a time sheet, begin with the known – employees are required to complete a time sheet once a week. Then, move to how to navigate the corporate time keeping system. Next, talk about how to properly code the hours for projects assigned.

As mentioned previously, start with the end in mind. Identify the job performance required. Then, identify the **competencies and tasks** needed to achieve that required level of performance. Write the terminal objectives from those reliability-related tasks. Then, write enabling objectives for the base knowledge and skill components it takes to do the terminal objective as we did in the timesheet example.

In addition to sequencing your objectives from simple to complex, they need to be sequenced from the enabling objectives to the terminal objectives. Then, the terminal objectives roll up to the required task performance. This sequencing is important for efficient training. Writing the sequence correctly is the key to training that helps prepare workers without wasting precious training time.



Always keep in mind the learning objectives are what you are going to measure.

Learning Measurement

Finally, you must measure if learning has occurred. Using strong, measurable action verbs helps develop assessments consistent with the learning objectives.

An assessment's purpose is to measure student performance against the criteria stated in the learning objective. Make sure your assessment applies to the concepts and content delivered in the course. If you find it's difficult to write a question to assess a learning objective, you might rethink the learning objective.

What is it you really want the student to be able to do?

Think about your assessment format. For example, if the verb in your learning objectives is choose, list, or describe, a **written exam** or assessment is probably the best fit. Those verbs are also lower level verbs and are usually associated with enabling objectives. **Short-answer format** is appropriate for many knowledge action verbs, including recall, identify, and list.

Verbs such as choose and select should be tested using a **multiple choice format.** Learning objectives that require the student to classify or relate should be tested with a **matching format assessment.**

Learning objective verbs demonstrate, perform, or simulate indicate a **performance assessment.** These verbs are at a higher level of learning – more toward terminal than enabling. Again, these skill action verbs suggest a performance test format, and knowledge action verbs suggest one or more of the written formats. For example, start up and shut down are skill action verbs that suggest a performance assessment format.

Although learning objectives focus on performing certain tasks, remember there are also attributes, knowledge, and competencies to consider. Without learning objectives, it's difficult for students to know what they're supposed to learn. For example, in the classroom, a trainer can talk

extensively about a concept. But, unless they state explicitly what the student needs to know and why, it's difficult for them to know where to direct their attention. Do they need to know the details of that specific theory or the procedures they're supposed to glean from the example? Or was it just a story to entertain the new workers? Trainers and students can both waste time if learning objectives aren't clear.

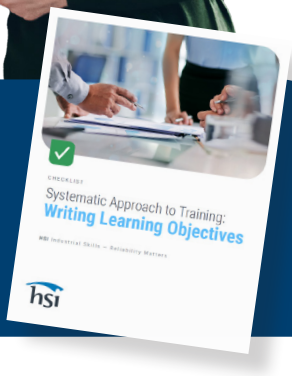
Writing learning objectives is part of a Systematic Approach to Training. In the case of ADDIE, it falls into the Design phase, after identifying the reliability-related, company specific tasks during Analysis. After you write your learning objectives, develop your content and deliver your training. Finally, the assessment takes place in the Evaluation stage.

Learning objectives should be:

- Consistent with the goals of the training program
- Clear
- Measurable
- Realistic and doable
- Appropriate to the level of the learner

This White Paper has a companion document you might find helpful:

Writing Learning Objectives Checklist



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