

Simple Instructional Design

Chapter 2 – Learning Objectives (LOs)

In this chapter, you'll learn about Bloom's Taxonomy, an invaluable tool for crafting Learning Objectives (LOs). We'll explore the benefits of using the Taxonomy and how its levels correspond to engagement and depth of learning. You'll discover how to use the Taxonomy to create LOs that match the level of learning that best suits your unit and how to ensure that your LOs are measurable. This chapter has "Check Your Understanding" questions designed to keep you engaged with the material. I suggest you attempt to answer them on your own, then turn to the back of the chapter to find their answers and feedback.

Learning Objectives

1. Explain the levels of Bloom's Taxonomy and how they differ with regards to learning and engagement.
2. Use Bloom's Taxonomy to choose appropriate verbs for your unit's level of learning.
3. Choose measurable verbs for your LOs.

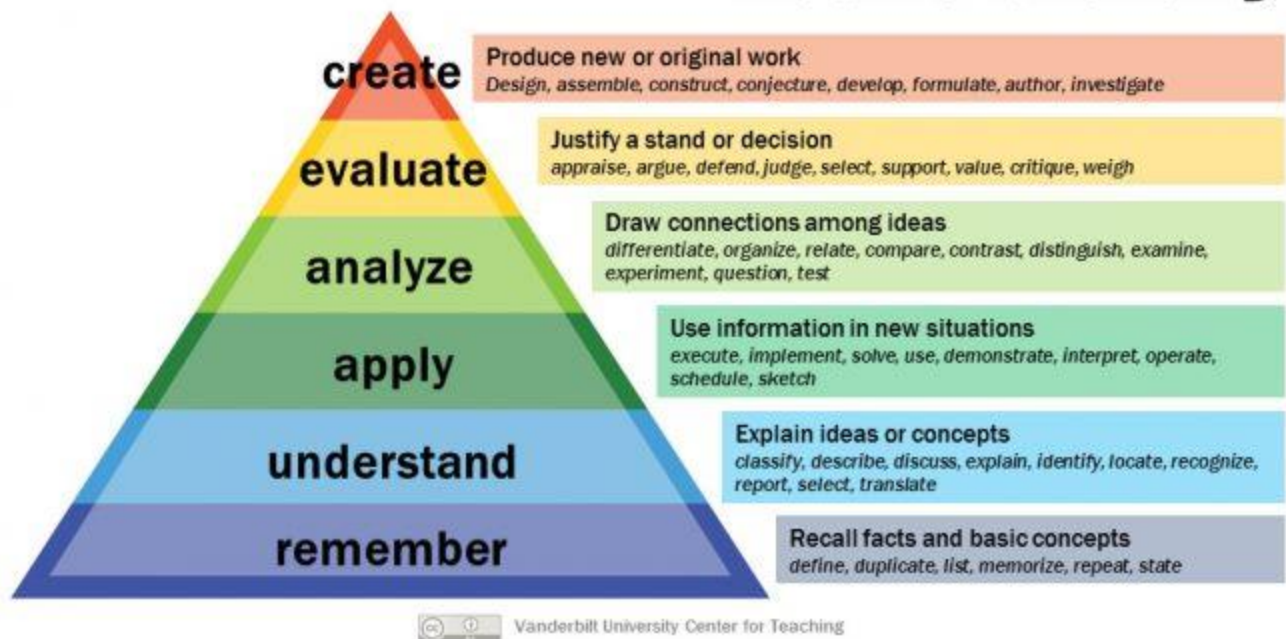
Chapter Outline

- Section 1: Bloom's Taxonomy
- Section 2: Level of Bloom's Taxonomy
- Section 3: Choosing Appropriate Verbs for LOs
- Section 4: Choosing Measurable Verbs for LOs

Section 1: Bloom's Taxonomy

Bloom's Taxonomy was originally published in 1956 as a tool for classifying educational goals (Bloom, 1956). A more user-friendly revision was published in 2001 (Anderson & Krathwohl, 2001), and can be seen in the image below (Vanderbilt University Center for Teaching, 2016).

Bloom's Taxonomy



This version of the Taxonomy provides verbs that correspond with learning at different levels, making formulation of measurable and appropriate objectives easy. The level of learning difficulty increases as you move upwards in the pyramid; verbs on the *Create* level offer the most challenging objectives, while those on the *Remember* level lead to LOs that assess a simple level of learning (Anderson & Krathwohl).

Your LOs can be as challenging as necessary/appropriate, but keep in mind that most learners perform best when guided through the Taxonomy from the bottom to the top. No matter the ultimate LO, start your learning unit with some activities and assessments at the bottom of the Taxonomy and work towards more difficult levels. Starting a learning unit by requiring that learners design something from scratch should only be done if you know your learners have previous experience with the lower levels of the Taxonomy. This could be the case if, for example, your unit is the capstone of a series.

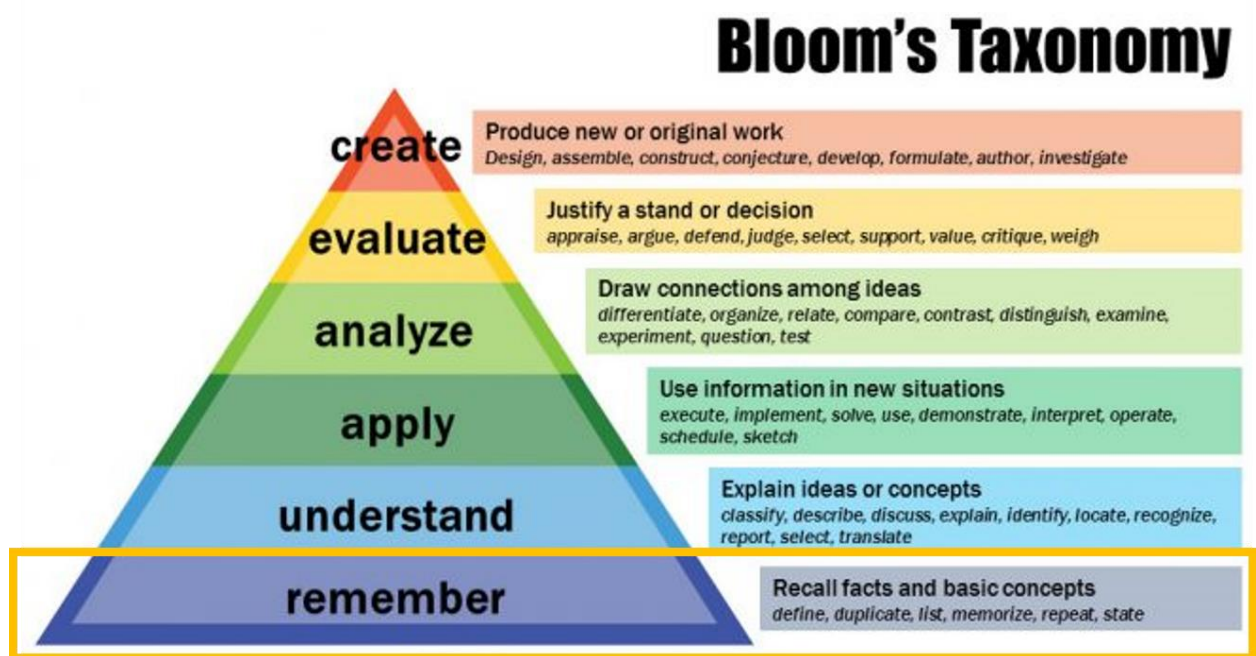
Section 2: Levels of Bloom's Taxonomy

Bloom's Taxonomy has six levels, each with a set of verbs that correspond to the same type of mental activity:

1. Remember: Recall facts and basic concepts
2. Understand: Explain ideas or concepts
3. Apply: Use information in new situations
4. Analyze: Draw connections among ideas
5. Evaluate: Justify a stand or decision
6. Create: Produce a new or original work

1. Remember: Recall facts and basic concepts

This is the lowest level of the Taxonomy, the least engaging, and produces learning at a superficial level. However, as you can see from the pyramid, it's the base on which all other levels are built. For example, learners cannot achieve LOs on the *Create* level unless they can also *Remember* related facts and basic concepts.



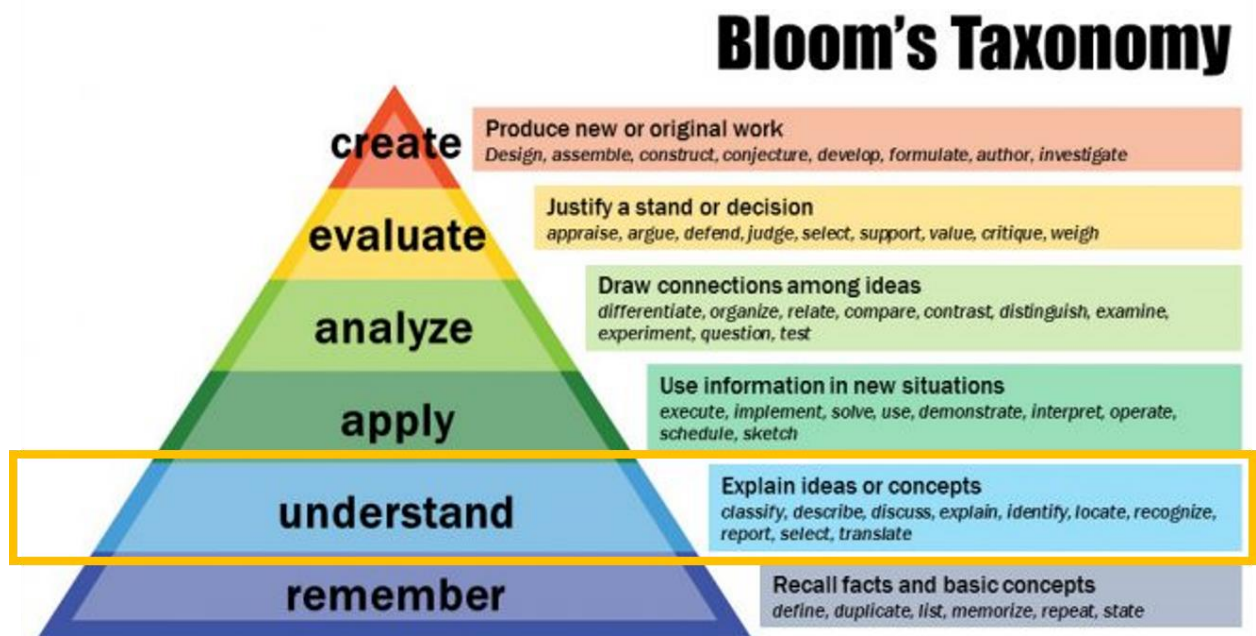
This level of the Taxonomy includes verbs like: *define*, *duplicate*, and *repeat*. Many learners have difficulty with LOs above this basic level, due to the problem of “teaching to the test.” Learners who are not required to progress past this level can regurgitate phrases and definitions, but aren’t able to explain their meaning or relationship to other concepts, much less create something new with them. This is also the easiest level for an instructor to assess, often using multiple choice questions.

Check Your Understanding

- Which of the following verbs are on the *Remember* level of the Taxonomy?
 - A. Classify
 - B. List
 - C. Organize
 - D. Defend
- Why could one argue that the *Remember* level is the MOST important?
- Why could one argue that the *Remember* level is the LEAST important?

2. Understand: Explain ideas or concepts

This second level of the Taxonomy is slightly more challenging and engaging than the first. Verbs from this level include: *describe*, *explain*, and *recognize*. Learners must remember basic information from the first level AND think about it more deeply to achieve LOs on this level.

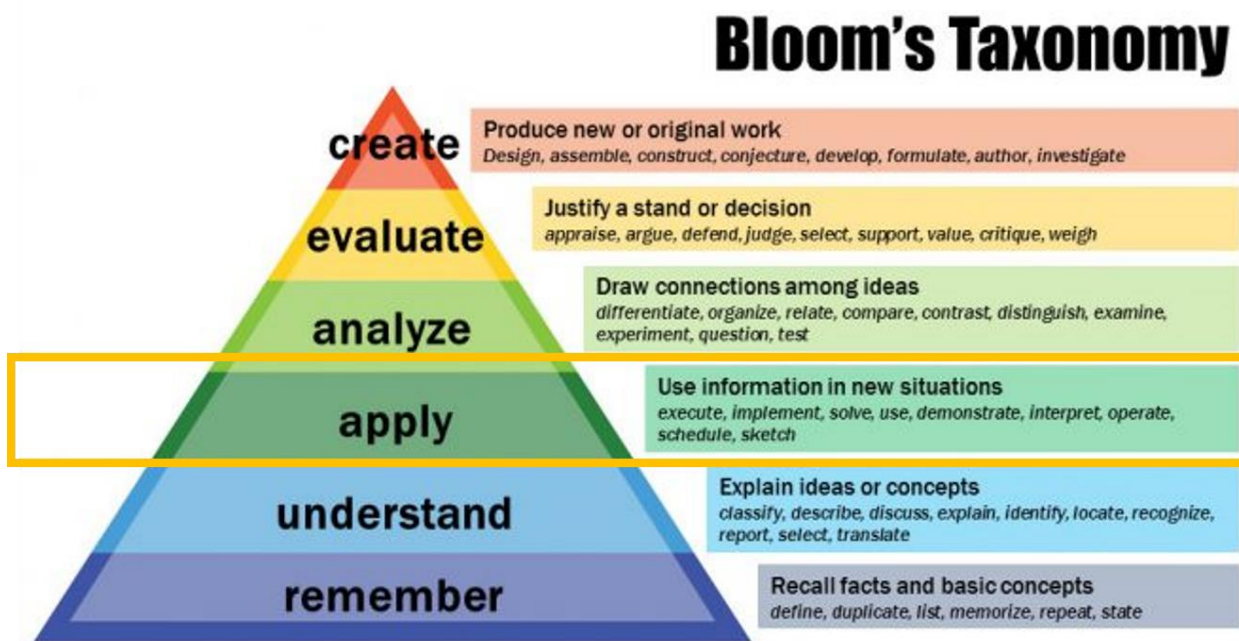


Check Your Understanding

- Which LO is from the *Understand* level of the Taxonomy?
 - A. Argue your stance on a topic of importance to you
 - B. Memorize the names and locations of major arteries in the body
 - C. Assemble pre-existing materials into a package for 6th grade Earth Day activities
 - D. Apply the strategies of clicker training to teach a cat a new task
- Write an LO that requires learners to do something from the first AND second levels of the Taxonomy. Example: Name the bees shown in the images and group (classify) them according to their pollen-carrying methods.

3. Apply: Use information in new situations

The third level of the Taxonomy requires that learners remember and understand concepts well enough to see how they would work in new situations. The troublesome word problems from elementary school math classes were usually examples of application questions.



Learners tend to have little practice with LOs on this level, so starting simple and building gradually is important for success.

Examples of LOs on this Level

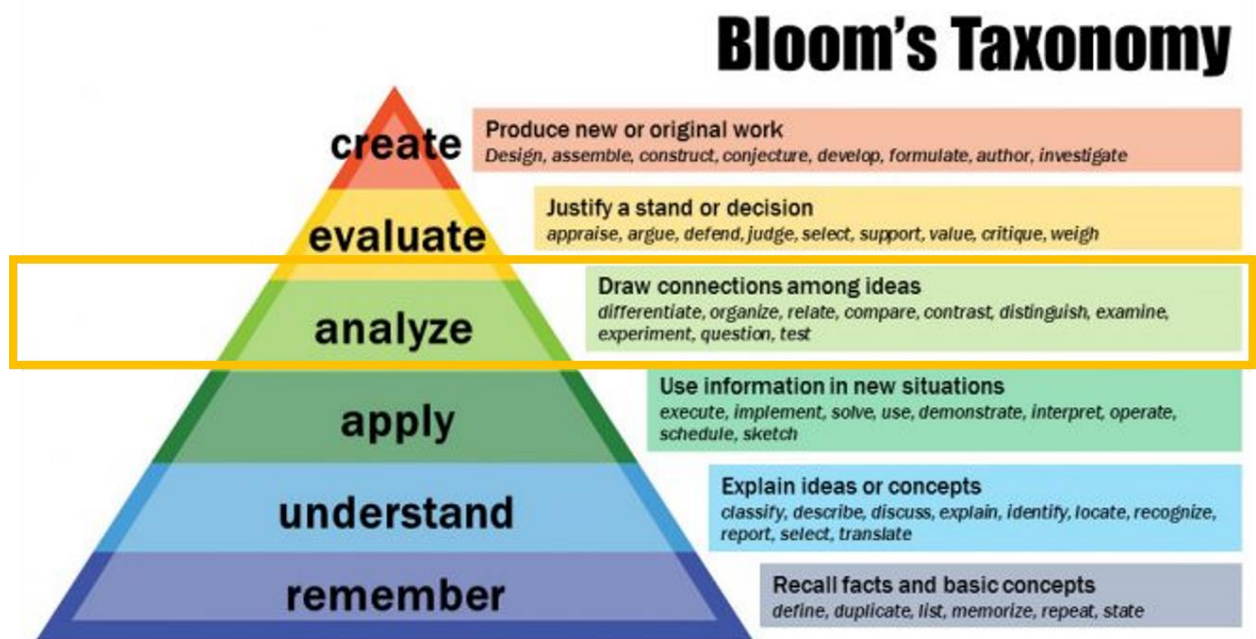
- Simple: Apply what you've learned about basic addition and subtraction to new situations.
- Complex: Apply what you've learned about basic addition, subtraction, multiplication, and division to new situations.

Check Your Understanding

- Why is the second LO from the examples above more difficult than the first?
- Write one LO on the *Apply* level that is simple and one that is more complex

4. Analyze: Draw connections among ideas

This level of the Taxonomy is more difficult and results in deeper learning than the lower three. Learners must understand content well enough to see how concepts relate to each other; how they're similar and different. This is difficult for people who have not been required to learn at this level in the past, so start simple and work towards greater complexity.



Examples of LOs on this Level

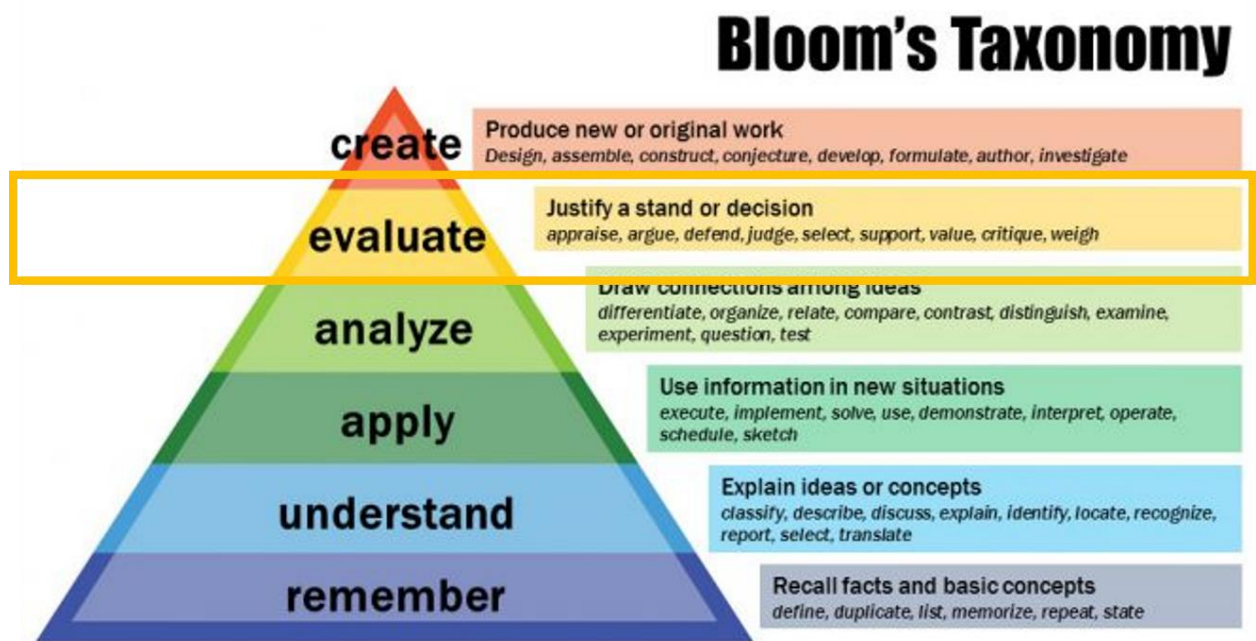
- Compare and contrast four plants and their benefits to pollinators
- Differentiate among flowers of different plant families
- Test the speed of water evaporation at three different temperatures

Check Your Understanding

- Write two examples of LOs at the *Analyze* level

5. Evaluate: Justify a stand or decision

Learning at this level requires a deeper understanding of ideas, how they relate to each other, and why some might be more appropriate for certain situations than others. Learners who can debate the merits of one strategy over another, or argue why they think a specific course of action should be taken, have a firm grasp of the material.



Examples of LOs on this Level

- Defend your argument about whether red or green jelly beans are better
- Judge the best presentation from among your fellow students, based on content, delivery, and aesthetics

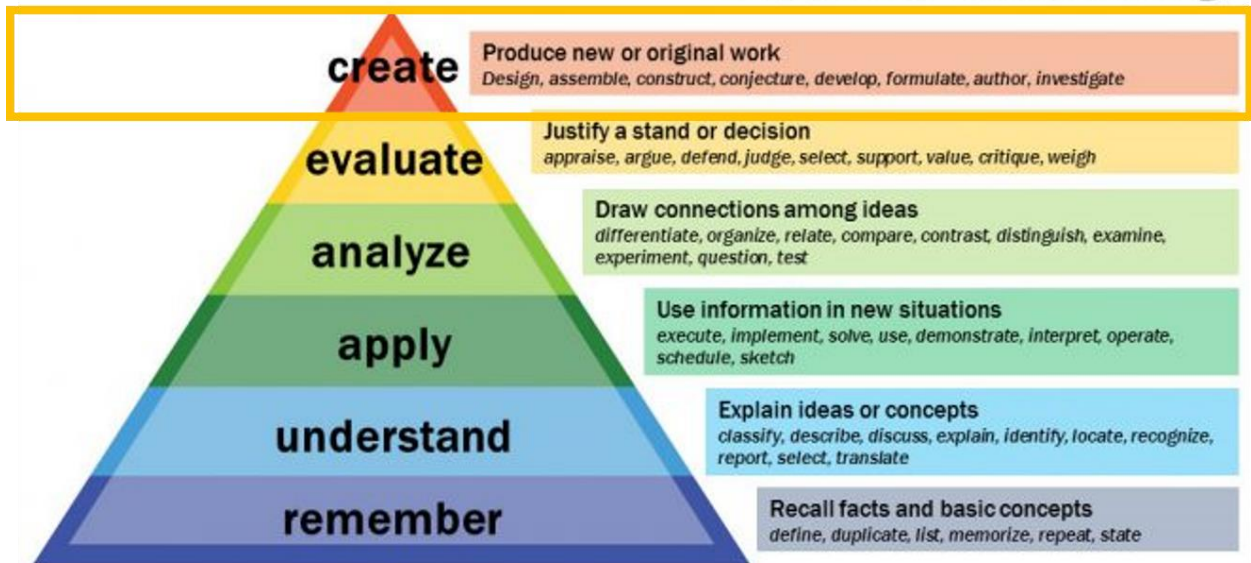
Check Your Understanding

- Write two examples of LOs from this level

6. Create: Produce a new or original work

This level of the Taxonomy results in the deepest learning and is also the most difficult. Very few learners have experience with this level of the Taxonomy. Approach this level gradually, as discussed with the other levels near the top of the pyramid.

Bloom's Taxonomy



Think about final assessments and standardized tests and the level at which they assess learners. Most of these can't assess beyond the *Remember* or *Understand* levels, because they're auto-graded and multiple choice. Few people carry any lasting impressions from learning units that remain at the lowest levels of the Taxonomy. A final assessment on the *Create* level results in learners taking something with them into the rest of their lives. It is, however, more time-consuming for the instructor to assess at this level.

Examples of LOs on this Level

- Design and present a 60-minute lesson on cat behavior
- Create a sustainability plan for a local business

Check Your Understanding

- Write two examples of LOs from this level

Section 3: Choosing Appropriate Verbs for LOs

Think about the levels of learning you want to include in your unit and choose verbs from the Taxonomy to match. For instance, an introductory unit might have a couple of LOs from the *Remember* and *Understand* levels, and one from an intermediate level. An advanced learning unit, which requires prerequisites, might have only LOs from the upper levels of the Taxonomy.

For a stand-alone learning unit that assumes no prior knowledge, you might decide to include LOs from low, medium, and high levels of the Taxonomy. The verbs you choose for your LOs should be informed by the learning levels you want to include, the assessments available, and the time that will be allowed for the unit and the assessment.

Example LOs

- Example LOs for a 1-hour introductory workshop on pollinators:
 1. Define pollination and pollinators
 2. Explain the importance of pollinators to humans
 3. Describe the major groups of pollinators
 4. Explain how to distinguish between pollinating bees, flies, and wasps
- Example LOs for a semester-long graduate course on bee pollinators:
 1. Differentiate between the major families of pollinating bees
 2. Create and deliver content for one lecture session on one of the major families of pollinating bees
 3. Evaluate the content delivery of your classmates' sessions, based on a rubric
 4. Evaluate a local business' pollinator habitat proposal and design an implementation plan based on your evaluation (there are two levels in this LO)

Check Your Understanding

- Devise two LOs for a one-hour introductory learning unit on the basics of microwave use

Section 4: Choosing Measurable Verbs for LOs

The importance of choosing measurable verbs for your LOs cannot be overstated. Using Bloom's Taxonomy to choose your verbs ensures that LOs will be measurable. Think about the types of assessments available while you write your LOs. A handy guide is that the verb needs to be changed if you can't think of a way to assess an LO.

Examples

Let's have a look at some examples of LOs that are difficult to measure and why:

1. LO: Develop an appreciation for the softness of alpaca fiber
Why this is difficult to measure: How do you measure appreciation? One could argue that it's possible, but you would have to create a rubric for it that would ensure fair evaluation for all learners. This is so much of a challenge that choosing a verb from the Taxonomy that aligns with your available assessments is more efficient.
2. LO: Learn to love llamas
Why this is difficult to measure: How do you assess love or whether someone has learned to love something as a result of completing your learning unit? As with the first example, it would be more efficient to choose a verb from the Taxonomy that aligns with your available assessments.
3. LO: Know how to knit a scarf
Why this is difficult to measure: "Know" is not a verb and is therefore difficult to measure as part of a Learning Objective.

Check Your Understanding

- Change the LOs above so that they ARE measurable.

References

Bloom, B.S. (Ed). (1956). Taxonomy of Educational Objectives: The Classification of Educational Goals. New York: Longmans, Green.

Anderson, L.W., & Krathwohl, D.R. (Eds) (2001). A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives. New York: Longman.

Vanderbilt University Center for Teaching. (2016, September 6). Bloom's Taxonomy. Used under CC BY 2.0 license. Retrieved from <https://www.flickr.com/photos/vandycft/29428436431>

Chapter 2 – Answers & Explanations

Section 2: Levels of Bloom's Taxonomy

1. Remember: Recall facts and basic concepts

- Which of the verbs are on the *Remember* level of the Taxonomy?
 - Answer: B.
 - Feedback: "Classify" is on the *Understand* level, "Organize" is on the *Analyze* level, and 'defend' is on the *Evaluate* level.
- Why could one argue that the *Remember* level is the MOST important?
 - Answer: This is the level of foundational knowledge on which all other levels are built. Without a solid grasp of this level of learning, people have difficulty succeeding at the higher levels.
- Why could one argue that the *Remember* level is the LEAST important?
 - Answer: Learning at this level is superficial and not especially useful for critical thinking or handling real-world situations.

2. Understand: Explain ideas or concepts

- Which LO is from the *Understand* level of the Taxonomy?
 - Answer: C.
 - Feedback: 'Assemble' is similar to 'locate' and 'recognize,' so it belongs on the *Understand* level. 'Argue' belongs on the *Evaluate* level, 'memorize' comes from the *Remember* level, and 'apply' comes from the *Apply* level.

3. Apply: Use information in new situations

- Why is the second LO more difficult than the first?
 - Answer: because it includes more skills; multiplication and division in addition to addition and subtraction.

4. Analyze: Draw connections among ideas

- Write two examples of LOs at the *Analyze* level
 - Example: Compare and contrast electric and gas ovens
 - Example: Distinguish between wooden and metal substances

5. Evaluate: Justify a stand or decision

- Write two examples of LOs at this level
 - Example: Appraise the value of a piece of antique furniture
 - Example: Support your stance that a specific candidate is best for the position

6. Create: Produce new or original work

- Write two examples of LOs from this level
 - Example: Develop a mathematical model to explain an observed behavior
 - Example: Investigate and report on the treatment of psychiatric patients at your choice of state hospital

Section 3: Choosing Appropriate Verbs for LOs

Devise two LOs for a one-hour introductory learning unit on the basics of microwave use

- Example: Identify the major components of a microwave
- Example: Explain the benefits of a microwave over an oven

Section 4: Choosing Measurable Verbs for LOs

Change the LOs above so that they ARE measurable:

1. Original LO: Develop an appreciation for the softness of alpaca fiber
New LO: Explain why alpaca fiber is one of the softest wools
2. Original LO: Learn to love llamas
New LO: Argue that llamas are lovable
3. Original LO: Know how to knit a scarf
New LO: Demonstrate how to knit a scarf from alpaca or llama wool