

The Understanding by Design Guide to Advanced Concepts in Creating and Reviewing Units

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Introduction

The Understanding by Design Guide to Advanced Concepts in Creating and Reviewing Units is targeted to individuals and groups interested in refining their skills in designing units of study based on *The Understanding by Design Guide to Creating High-Quality Units*. This guide is also organized around a set of modules through which designers are guided. Figure 1 offers a graphic representation of the organization of the modules in this volume.

This guide looks more closely at refinements to the unit designs, while also introducing new material on self-assessment, peer review, implementation, and supervision of the unit—under the new headings of Stages 4, 5, and 6.

Each module in both *Guides* includes the following components:

- Narrative discussion of key ideas in the module
- Guiding exercises, worksheets, and design tips for unit design
- An example of an emerging design

Figure 1

Outline of Modules

Stage 1— Desired Results	Stage 2— Assessment Evidence	Stage 3— Learning Plan
Module I: Unpacking Standards	Module J: Identifying Evaluative Criteria for Assessments	Module K: Refining the Learning Plan in Stage 3
Module L: Sharpening Essential Questions and Understandings	Module M: Authentic Assessment and Validity	Module N: Differentiating—Tailoring the Learning Plan to the Learners
Module O: Designing the Lesson Plan for Your Unit		
Module P: Obtaining and Using Feedback		

- Review criteria (design standards) with prompts for self-assessment
- References for further information

In addition to the print format, the *Guide* features online resources correlated to the text. Many of the exercises and worksheets are accessible as downloads in electronic form, as are additional unit examples. The online portion of the *Guide* will allow updates (such as more unit examples and new resources) to be readily accessed.

Users of the *Guide*, especially beginners, are invited to follow the exercises and worksheets to assist them in thinking through the unit design process. However, it is important to always keep the end—a coherent and well-aligned unit plan—in mind. If you find an exercise or worksheet unnecessary, feel free to skip it. Also, think of the exercises and worksheets like the training wheels on a bicycle. Eventually you'll find that you no longer need them as your understanding of UbD deepens and your unit design skills become more effective and automatic.

The modular nature of the *Guide* means that users need not follow the modules in the order presented. Your interests, strengths, and prior experience as a designer will inevitably dictate how you use this *Guide* and the sequence you follow. Think of the *Design Guide*, then, as a cookbook. In a cookbook there are chapters devoted first to recipes of appetizers, then to soups and salads, then to fish and meat, vegetables, and desserts. Similarly, the *Guide* is organized by the “menu” of a unit's parts—the elements of the unit template. But although the cookbook is organized, you need not read it from cover to cover or make all the recipes in the order in which they appear. So, too, in unit design. Like the recipe creator, your path is informed by the need to put the final work in recipe form, but recipe creation is inherently nonlinear and messy as you try things out, alter various ingredients, and double-back to ensure that the final product works.

Module I

Unpacking Standards

Purpose: To prioritize and focus on our content obligations appropriately.

Desired Results:

Unit designers will understand that

- Standards by themselves are not a curriculum; a curriculum works with the standards to frame optimal learning experiences.
- Standards and most goal statements need to be analyzed or unpacked because they may
 - be ambiguous;
 - be too broad or too narrow; and/or
 - reflect different kinds of goals simultaneously (e.g., knowledge, skill, understanding, performance indicators).
- Unpacking standards helps to clarify the long-term intentions behind the standards, distinguish among goal types, and focus unit planning.

Unit designers will be able to

- Unpack standards and other established goals that apply to the unit, and place them in the proper Stage 1 boxes.

Module Design Goals: In this Module, you will learn various ways to unpack standards and other goals to properly identify the various Stage 1 elements. The end product will be a refined set of desired results identified in Stage 1.

You should work on Module I if you are obligated to pre-established standards (state/provincial/national) or other goals (e.g., from a school or district mission) and if you are unfamiliar with the process of unpacking standards or other goals into the UbD Template.

You might skim or skip Module I if you are not obligated to use established local, state, or national standards or other formal goals.

Many users of this *Guide* will need to address externally mandated goals of some kind—most commonly state, provincial, or national standards. The UbD Template has a specific box for such established goals, on the left side of Stage 1 (see Figure I.1). This placement is meant to signal an important idea about state standards and other such obligations. The standards are *not* the primary goals of your unit design. Meeting them is necessary but not sufficient.

Consider an analogy with home building and renovation. The standards are like the building code. Architects and builders must attend to them but they are *not* the purpose of the design. The house to be built or renovated is to meet the needs of the client in a functional and pleasing manner—while also meeting the building code as a part of the larger integrated and coherent whole.

Similarly, although unit designs have to validly address external standards, we always want to keep the long-term educational ends in mind: an engaging and meaningful learning experience that develops learner understanding and curiosity while also meeting standards. That's why we place standards on the side of Stage 1. In other words, standards by themselves are not a curriculum. A curriculum works with the standards in a way to frame optimal learning experiences. The standards are more like the ingredients list for a recipe than the final meal; they are more like the rules of the game instead of strategy for succeeding at the game. A curriculum fleshes out the best ways to honor one's obligations while making learning as engaging and effective as possible.

Unpacking Standards

Standards can be somewhat opaque, and they often vary in clarity, complexity, and specificity. Some standards are broad, cutting across many courses and grade levels; others are narrow and content-specific. Some refer to content that must be taught; other standards refer to performance levels that must be achieved.

A standard has to be treated like any other nonfiction text; that is, we have to carefully analyze and interpret its meaning. A standard poses a challenge similar to the one posed by determining the meaning of the Bill of Rights in specific situations. In fact, a standard represents key principles that demand constant thought and discussion. That's what we mean by saying that educators need to “unpack” standards for local use. The practical meaning of a standard is not self-evident even if the writing is clear.

Consider this example:

Virginia History 5.7

The student will understand the causes and effects of the Civil War with emphasis on slavery, states' rights, leadership, settlement of the west, secession, and military events. [Source: VA Curriculum Framework United States History to 1865; Commonwealth of Virginia Board of Education Richmond, Virginia Approved—July 17, 2008]

Figure 1.1
Unpacking Standards Stage 1—Mathematics

Stage 1 — Desired Results	
Established Goals	Transfer
<p>Common Core State Standards in Math</p> <p>Interpret the structure of expressions</p> <p>1. Interpret expressions that represent a quantity in terms of its context.</p> <p>Write expressions in equivalent forms to solve problems</p> <p>3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.</p> <p>Rewrite rational expressions</p> <p>6. Rewrite simple rational expressions in different forms.</p> <p>Mathematical Practices</p> <p>1. Make sense of problems and persevere in solving them.</p> <p>2. Reason abstractly and quantitatively.</p> <p>3. Construct viable arguments and critique the reasoning of others.</p>	<p><i>Students will be able to independently use their learning to ...</i></p> <p>Solve nonroutine problems by persevering: simplify them, interpret expressions, and use equivalent forms based on the properties of real numbers and the order of operations.</p>
	<p>Meaning</p> <p>UNDERSTANDINGS</p> <p><i>Students will understand that ...</i></p> <p>1. In mathematics, we accept certain truths as necessary to permit us to solve problems with logical certainty (e.g., the properties of real numbers), whereas other rules are conventions that we assume just for effective communication.</p> <p>2. We can use the commutative, associative, and distributive properties to turn complex and unfamiliar expressions into simpler and familiar ones when problem solving.</p> <p>ESSENTIAL QUESTIONS</p> <p><i>Students will keep considering ...</i></p> <p>1. What important rules and conventions are required to make algebra “work”?</p> <p>2. How can we simplify this expression?</p>
	<p>Acquisition of Knowledge & Skill</p> <p><i>Students will know ...</i></p> <p>1. The commutative property and to which operation it applies (and when it does not apply).</p> <p>2. The associative property and to which operation it applies (and when it does not apply).</p> <p>3. The distributive property and to which operation it applies (and when it does not apply).</p> <p>4. The “order of operations” mathematicians use and why is it needed.</p> <p>5. What PEMDAS mean.</p> <p>6. What it means to “simplify” an expression via equivalent forms.</p> <p><i>Students will be skilled at ...</i></p> <p>1. Writing expressions in equivalent forms.</p> <p>2. Revealing and explaining properties represented.</p> <p>3. Rewriting rational expressions in different forms.</p> <p>4. Identifying equivalence that results from properties and equivalence that is the result of computation.</p> <p>5. Justifying steps in a simplification or computation by citing applicable laws, properties, conventions.</p>

Source: Goals from high school algebra standards, pp. 63–65. © Copyright 2011, National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.

What does “understand” mean here? Does it mean *make meaning of* and *transfer*? Or does it mean something narrower like *analyze*? Or is the demand far more modest, namely “Accurately state and explain what others—credible experts—have analyzed the causes and effects to be, as found in textbooks” (in other words “understand” = “know”)? As you can see, how we teach and how we assess this standard is greatly affected by the outcome of our inquiry. Such unpacking is essential at the local level if the standards are to be validly and consistently addressed across teachers, given the ambiguity of the key verb.

Even if we agree on what “understand” means here, there is a second question that must still be considered: What is an adequate understanding for a 5th grader? In other words, how well must a student understand the causes and effects? How sophisticated should that understanding be, to be a fair expectation of a 5th grader? In other words, merely knowing the content to be addressed is not enough information for local action. We need to analyze all relevant text to infer a reasonable performance standard for assessing student work, that is, to know when student work related to the standard is or isn’t meeting the standard.

Structure and Organization of Standards

Another reason for unpacking has to do with the fact that standards are typically written in a hierarchical outline form. In many documents, the first level is the most broad and comprehensive statement, and the second and third levels are typically more concrete and narrowly focused. Each discrete element and outcome of learning is listed in an analytic fashion.

Alas, as we well know from experience what seems like a good idea in theory—a hierarchical list of key elements—has an unfortunate common unintended consequence. Some educators think that standards, arranged as organized in lists, need to be covered, one by one, in lessons and units. Not only is this practice unwise pedagogically; it is not the writers’ intent. Some standards documents offer explicit cautions against such decontextualized teaching; for example:

Many of the objectives/benchmarks are interrelated rather than sequential, which means that **objectives/benchmarks are not intended to be taught in the specific order in which they are presented. Multiple objectives/benchmarks can and should be taught at the same time.** [emphasis in the original]

Source: 2007 Mathematics Framework, Mississippi Department of Education, p. 8

Here is how the Common Core State Standards in English Language Arts are introduced:

While the Standards delineate specific expectations in reading, writing, speaking, listening, and language, each standard need not be a separate

focus for instruction and assessment. Often, several standards can be addressed by a single rich task. (*Source: Common Core State Standards for English Language Arts and Literacy in History/Social Studies, Science, and Technical Subjects*, p. 5)

Alas, this advice is routinely overlooked or ignored in local curriculum work. And yet the distinction between discrete elements and a more integrated curriculum plan is just common sense. A good meal is more than just the listed ingredients in the recipe; a successful home renovation doesn't merely involve contractors addressing each isolated piece of the building code; music is not made by learning hundreds of discrete notes, key signatures, and tempos in isolation from performance. In fact, if transfer and meaning making are the goals of education, they can *never* be achieved by a curriculum that just marches through discrete content elements, no matter how sensible the hierarchical list is as an *outline* of a subject's high points.

Misconception Alert

Standards documents are written in a hierarchical list format. This analytic framing of standards can easily mislead teachers into the following misconceptions:

- The standard clearly expects me to teach and test each objective in isolation.
- I'll just focus on the top level (i.e., the broadest) standard. Then, I can justify most of what I already do as meeting the standard.
- I'll just focus on the lowest levels and check off these very specific objectives that are covered in my normal unit. Then, I have addressed the standard.

Each claim is inaccurate and leads to needlessly isolated and ineffective teaching and assessment.

Different Goal Types in the Standards

A third reason for unpacking standards results from the fact that standards not only come in different shapes and sizes, but typically address different *types* of learning goals. It is not uncommon for a standard to mix together acquisition, meaning, and transfer goals in the same list without calling attention to the fact that each type of goal is different and likely requires different instructional and assessment treatments. Here is an example from the Common Core State Standards for 5th grade math:

Number and Operations in Base Ten—5.NBT

Understand the place value system.

1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
3. Read, write, and compare decimals to thousandths.
4. Use place value understanding to round decimals to any place.

As we interpret the standards, 1 and 2 are really about meaning-making (though the verb “recognize” may lull some into thinking that this is about low-level acquisition), 3 is a mixture of acquisition (“read and write”) and meaning-making (“compare”), and 4 could be either skill focused or transfer focused, depending upon how novel, complex, and unprompted the tasks given to students. The careful interpretation is why it is neither redundant to have a separate section on the Template for unit-relevant standards (or established long-term goals) nor superfluous to place the appropriate parts of a standard into the Stage 1 and 2 boxes, with additional clarifying language when needed. *When completed, Stage 1 provides evidence that the standards were unpacked in a transparent way, and shows how the various goals properly relate to one another.*

So, rather than simply lumping all standards together and calling them your unit goals, we strongly recommend that designers carefully examine each standard and place its components—whether stated or implied—in the *appropriate* Stage 1 box: Transfer, Essential Questions, Understandings, Knowledge, or Skill.

Misconception Alert

Be careful if you work in a state that makes reference to “big ideas” and “essential questions” in their standards. They do not always correspond to how we define these terms in UbD. For example, Florida highlights certain standards by labeling them big ideas, but this use of the phrase is meant to simply signal *priorities* in general rather than specific transferable ideas to be grasped and used.

MA.5.A.2, BIG IDEA 2: Develop an understanding of and fluency with addition and subtraction of fractions and decimals. (Source: www.floridastandards.org/Standards/PublicPreviewIdea196.aspx)

Similarly, some states have listed essential questions in their standards or resource documents, but most of these would not meet the UbD design standard. For example, consider two listed “essential questions” in *The Virginia History and Social Science Standards of Learning Curriculum Framework 2008*, a companion document to the 2008 *History and Social Science Standards of Learning*:

- What are the seven continents?
- What are the five oceans?

Although these questions may point toward important knowledge, they are certainly *not* essential in the UbD sense because they are factual questions, not designed to cause in-depth inquiry and discussion. In sum, beware—especially when familiar jargon is used in the documents.

Turning Standards into Sound Curriculum, Instruction, and Assessment

Based on these cautions and mindful of the need for practical tools in working through these issues, we offer the following five tips for unpacking the standards.

Tip 1. Look at all key verbs to clarify and highlight valid student performance in which content is used. Carefully analyze the verbs and try to determine their meaning for assessment and thus instruction. For example, does “respond to” mean “resonate with” or “write about” or “make a personal connection to the text”? What counts as “understanding” the causes and effects of the Civil War? For example, does “understand” in this case mean “accurately recall what the textbook said” were the major causes? Or are the students expected to make their own analyses, based on primary and secondary source evidence, and also defend them? Obviously, the answers affect the overall unit design and, especially, the assessments.

One would hope, of course, that the language used in standards documents is consistent and grounded in a valid framework such as Bloom’s taxonomy. For example, it seems reasonable to assume that phrases like “analyze” or “solve problems” are meant to signal more higher-order inferential work than is required by standards that say “describe” or “identify.”

Our experience from working with standards-writing committees proves that verbs are not always used in a consistent or appropriate manner. Nor are glossaries containing operational definitions of key verbs usually provided. Making matters worse, most standards documents do not state whether there is a *pedagogical* rationale behind the use of specific verbs or instead whether the verbs vary for *aesthetic* reasons (to avoid repetition in the text).

We recommend that your committee members scour relevant websites and communicate with state education departments to clarify this basic issue when necessary. We also highly recommend that educators look at whatever test specifications exist for state standards because the test-maker needs this same information in order to construct valid measures. In some states, the test specifications found under the state assessment section are more helpful than the standards themselves. For example, take a look at Florida Math Test Specifications at http://fcat.fldoe.org/pdf/G9-10_Math_Specs_1-39.pdf.

Tip 2: Look at the recurring nouns that signal big ideas. A related approach to unpacking standards involves finding important nouns, that is, key concepts, principles, themes, and issues that can be turned into essential questions and understandings. Here is an example from the Common Core State Standards that illustrate this approach (bold added to key nouns that signify big ideas):