Collaborative Curriculum Design:
Unit Names / Breaking Apart Standards Guide

OVERVIEW

This guide focuses on a *standards-interpretation procedure* to aid in collaboratively designing or refining standards-based learning recorded in Consensus Maps within a school-site, or recorded in Essential Maps utilized by learning organizations that have two or more like schools (e.g., five elementary schools; 3 middle schools; 2 high schools). The procedure is known as *breaking apart standards* and asks teachers to collegially analyze standard statements' explicit, and most importantly, *implicit* concepts, content, and skills that will be incorporated into units of study, as well as considering formative and summative assessments that accurately measure the designed planned-learning curriculum. When designing collaborative curriculum, dialogue focuses on the *collective agreement* regarding the *interpretations* of standard statements' explicit and implicit expectations that ensure students experience a well-planned, rigorous curriculum.

Before the breaking apart standards procedural steps are explained in detail, it is imperative to first spend time focusing on how standard statements and standards documents affect the design process.

A Standard Statement

Throughout this guide the term *standard statement* is used in reference to an *individual* proficiency target. For example, what is in italics below is one standard statement in a set of relational standard statements (Figure 1.1).

Figure 1.1 Standard Statement

Understand and apply the basic concepts of probability
• Name the possible outcomes for a probability experiment. • *Predict the most likely or least likely outcome in probability experiments (e.g., Predict the chance of spinning one of the 2 colors on a 2-colored spinner.).* • Predict the outcome of a grade-level appropriate probability experiment. • Record the data from performing a grade-level appropriate probability experiment. • Compare the outcome of an experiment to predictions made prior to performing the experiment. • Compare the results of two repetitions of the same grade-level appropriate probability experiment.

Explicit Versus Implicit

When designing standards-based curriculum it is critical that teachers never simply copy a standard statement *in its entirety* and paste it in either the content or skills element field within a curriculum map. This indicates there is a misunderstanding of *both* the purpose of the standard statements and how to interpret the standard statements regarding student-learning expectations.

Critical to the breaking apart standards procedure is focusing on the implicit expectations within one or more standard statements that affect learning expectations related to content and/or skills. During the process teachers must a) agree on the *unspoken* (non-stated) implicit learning that will become a part of scaffolded learning to ensure students can independently exhibit the explicit standard statements' expectations; and b) determine how the non-stated expectations will be translated and incorporated *explicitly* as content and skills learning within teacher team-designed units of study.

Imagine a teacher team is working together to analyze both the explicit and implicit learning involved in the following standard statement:

> **Standard Statement:** Use geography concepts and skills to find solutions for local, state or national problems.

Given maturational and grade-level expectations, the teachers begin to dig deeper than the "surface" standard statement and through the use of the breaking apart standards procedure agree that there is both content (what the students must know) and skills (what students must do in relationship to the knowing) inferences made within this statement. To summarize their discussion points, the teachers make note that this statement *implies* students must have:

- A conceptual understanding of affecting variables (e.g., migration, man versus nature, shortage of natural resources)
- Content knowledge of geographical attributes (e.g., rivers, mountains, deserts, forests, climate)
- Content knowledge of human activity (e.g., transportation routes, settlement patterns, mining or other types of production using natural resources)
- Skill abilities other than *find* that include:
    - compare and contrast / evaluate / critique / hypothesize / justify
        - process abilities: formulate connections.

An important step in the breaking apart standards procedure includes a teacher team determining the *specific wording* of the intra-aligned content and skill statements that will be recorded in one or more units of study. As the team works on coming to agreement on what the implicit learning will be in conjunction with the standard statements' explicit learning, the teachers may need to a) review students' learning expectations in previous years, future years, and current year to determine if the implicit/explicit expectations are included elsewhere; and b) if in existence, review and rethink current in-use collaboratively designed units of study that were developed prior to breaking apart the standards to ensure that the current learning expectations explicitly state in the content/skills that which the teachers are now agree on regarding the implicit learning expectations.

Assuming there have been not previous collaboratively designed standards-based units of study the teacher team will also need to discuss whether the explicit/implicit content and skills learning in question will "live" in a stand-alone, in-depth unit of study or live within a spiraled series of units that build upon previous learning. If the teachers choose to design spiraled learning units, will the units be a series lasting a few months of the school year or will the series last the entire school year? The answers to this type of design question will vary depending on the complexity of the student-learning expectations and desired outcomes.

A Teacher-Designed Curriculum

It is natural for teachers to wrestle with the notion of curriculum design. Design is defined as *a scheme or pattern that affects and controls function or development*. Defining a scheme or pattern regarding curriculum may be a brand new responsibility for teachers since many learning organizations have in years past given this role to outside sources (e.g., companies) or to a few select key teachers and administrative specialists. Curriculum mapping asks all teachers who are involved in the actual instruction (curriculum practice) of individual or multiple disciplines to be intimately involved in designing the curriculum since they are the ones closest to the students and their learning needs (Jacobs, 2004).

Some disciplines are more challenging than others when it comes to curriculum design. For example, many find mathematics easier to design units of study for than English/Language Arts. Designing interdisciplinary units of study involves different considerations than designing single-discipline units of study. A design decision that some teacher teams may need to make is how to best

address process skills' standard statements within a specific discipline and course. Should the process skills (e.g., problem solving; reasoning; questioning; logic) expectations be embedded exclusively within units of study that focus on specific concepts, themes, or topics, or should the process skills expectations first be focused on in a stand-alone unit of study to build background knowledge at the onset of the school year and then embedded the process skills into concept, theme, or topic-based units for the remainder of the school year?

A school or district's teachers-as-curriculum-designers approach will involve teachers from various educational backgrounds, years of teaching experience, and comfort levels with determining learning structures. Therefore, it must be realized early on that there is no one correct way or right way for a teacher team to plan out how to design standards-based curriculum.

Various disciplines constitute various design schemes or structures. This guide is intended to highlight what is involved when proactively preparing to design new or review previously designed curriculum wherein standards-interpretation is a part of the process. Given units of study are to be designed based on standard statements, whether local, state, national, international, private or publicly provided, design teams need to be proactive in discussing how to collaboratively interpreting standard statements. A teacher team or teams should collegially discuss the key points in this guide and decide how to make the curriculum-design process "their own" in practice. Be aware that teacher teams commonly make modifications to their original design-process plan as they put it into practice. As Aristotle so aptly stated, "One must learn by doing the thing, for though you think you know it, you have no certainty until you try."

Conclusion

When teachers are asked to design planned-learning Consensus Maps or Essential Maps and do not have previous standards-based curriculum documentation to work from, often times the question is posed, "Can't you just tell us step-by-step how to design our units of study?" There are various models recommended for unit design so to say that is one step-by-step way is not being true to the creativity of design. Regardless of the standards-based design model chosen or developed, there must be an emphasis on the collaborative work of teachers determining both the explicit and implicit learning expectations. The incorporation of the breaking apart standards procedure therefore works well with any design process. While the design process eventually leads teachers to developing a horizontally and vertically articulated curriculum contained within curriculum maps, the journey to reach this destination can differ per discipline and teacher design team. A teacher team must make the process their own as they formulate a personalized step-by-step procedure.

To summarize, the breaking apart standards process involves:

- predetermining the standard statement or relational statements involved in designing or reviewing a particular course and its units of study;
- breaking apart the standard statement or relational statements to first recognize the explicit learning expectations;
- analyzing and agreeing upon the standard statement or relational statements' implicit learning expectations and writing the expectations as detailed content and skill statements;
- investigating when and if the now detailed explicit/implicit learning expectations occur in previous, future, or current academic years;
- designing the course's curriculum using stand-alone and/or spiraling units of study based on the collective decisions made regarding the explicit/implicit learning expectations;
- recording the course's units of study in a curriculum map within a mapping system.

Built into this six-fold progression are four recommended steps that can aid teachers in the collaborative agreement process. These four steps are discussed in detail after first addressing the variances in standards document structures and how this affects curriculum development and unit design.

STANDARDS DOCUMENTS AND UNIT NAMES

The most common method public or private organizations or institutions use to develop standards documents is to assemble a specialized committee or task force to work together to generate the standard statements for a given discipline. For example, the state of Arizona currently has nine (or eleven if including the subcategories for Language Arts) areas, or disciplines, included in the K-12 Arizona Academic Content Standards.

One of the first tasks a specific discipline's committee or task force must accomplish is determining the scheme or structure for conveying the document's information in a meaningful manner to its readers. It is not uncommon for each discipline to create a different meaningful manner. Therefore, a discipline's scheme or structure can affect not only *what* is included in designed units of study regarding content and skills (as well as appropriate assessments), but *how* the units of study are organized and housed within a mapping system based on horizontally and vertically articulated unit names.

Standards Documents

A discipline's standards document's structure will somehow subdivide student expectations into standard strands. While a standards committee or task force may not literally use the term strands to indicate the subdivisions, it is implied given that the term *strand* refers to *a narrowing down of a larger entity*.

The structure of the narrowed-down focuses within a discipline's strands can vary significantly. To illustrate this point, first take a look at the strand structures for four disciplines within the Arizona academic standards:

Mathematics
Strand 1 - Number Sense & Operations
Strand 2 - Data Analysis, Probability, & Discrete Mathematics
Strand 3 - Patterns, Algebra, & Functions
Strand 4 - Geometry & Measurement
Strand 5 - Structure & Logic

Science
Strand 1 - Inquiry Process
Strand 2 - History and Nature of Science
Strand 3 - Science in Personal and Social Perspectives
Strand 4 - Life Science
Strand 5 - Physical Science
Strand 6 - Earth and Space Science

Visual Arts
Strand 1 - Create
Strand 2 - Relate
Strand 3 - Evaluate

Technology
Strand 1 - Fundamental Operations and Concepts
Strand 2 - Social, Ethical and Human Issues
Strand 3 - Technology Productivity Tools
Strand 4 - Technology Communications Tools
Strand 5 - Technology Research Tools
Strand 6 - Technology as a Tool for Problem Solving and Decision Making

While these examples illustrate that this level of narrowing down is pretty straight forward, it becomes more complex when a task force or committee narrows down the learning *within* a specific

discipline's strands. There is a wide spectrum to how this next level of narrowed-down information may be structured.

For the Arizona academic standards the term used for this next level of narrowed-down information is *concepts.* While the term used in your standards documents may be different, the point being made here focuses on the *variations* regarding how each discipline chooses to structure the information.

Arizona's art strands have five *consistent* concepts for *each* of this discipline's three strands:

Strand 1 - Create
- **Concept 1: Creative Process, Artworlds, Art Issues & Values**
- **Concept 2: Materials, Tools, Techniques**
- **Concept 3: Elements and Principles**
- **Concept 4: Meanings and Purposes**
- **Concept 5: Quality**

Strand 2 - Relate
- **Concept 1: Creative Process, Artworlds, Art Issues & Values**
- **Concept 2: Materials, Tools, Techniques**
- **Concept 3: Elements and Principles**
- **Concept 4: Meanings and Purposes**
- **Concept 5: Quality**

Strand 3 - Evaluate
- **Concept 1: Creative Process, Artworlds, Art Issues & Values**
- **Concept 2: Materials, Tools, Techniques**
- **Concept 3: Elements and Principles**
- **Concept 4: Meanings and Purposes**
- **Concept 5: Quality**

This is not the case for the science strands. Each strand has a *different* set of concepts that *vary* at *different* grade levels. For example:

Strand 4 - Life Science

Concept 1 (K-4): Characteristics of Organisms
Concept 1 (5-8): Structure and Function in Living Systems
Concept 1 (HS): The Cell

Concept 2 (K-4): Life Cycles
Concept 2 (5-8): Reproduction and Heredity
Concept 2 (HS): Molecular Basis of Heredity

Concept 3 (K-4): Organisms and Environments
Concept 3 (5-8): Populations of Organisms in an Ecosystem
Concept 3 (HS): Interdependence of Organisms

Concept 4 (K-8): Diversity, Adaptation and Behavior
Concept 4 (HS): Biological Evolution

Concept 5 (HS): Matter, Energy, and Organization in Living Systems (Including Human Systems)

Based on this structure, when designing vertically articulated science curriculum the teachers will need to make certain that students experience overarching big ideas or enduring understanding throughout and among the grade-level bands when designing the strands' units of study.

Unlike science, mathematics standards have *different* concepts per strand that remain *consistent* K-12. For example:

Strand 3 - Patterns, Algebra, & Functions
- **Concept 1: Patterns**
- **Concept 2: Functions and Relationships**
- **Concept 3: Algebraic Representations**
- **Concept 4: Analysis of Change**

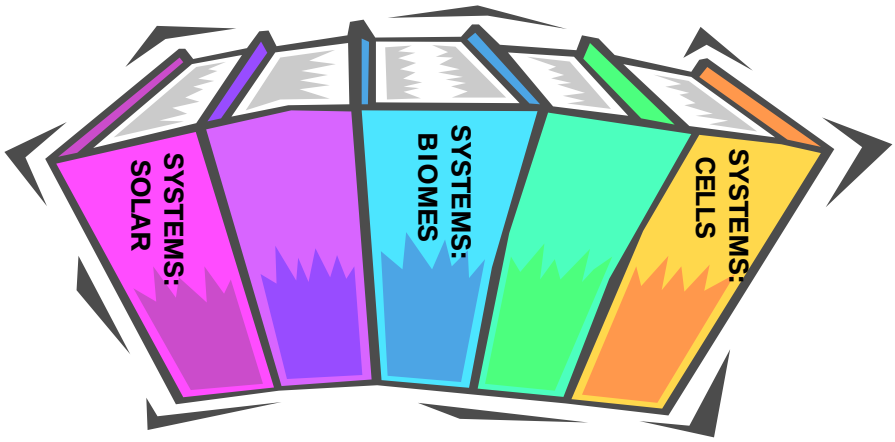
Strand 4 - Geometry & Measurement
- **Concept 1: Geometric Properties**
- **Concept 2: Transformation of Shapes**
- **Concept 3: Coordinate Geometry**
- **Concept 4: Measurement - Units of Measure/Geometric Objects**

These are just a few examples of how varied the structures can be in a given discipline's standard strands. Variations within one state, from state to state, and within national and international standards, points back to the reality that there is no one absolute way to structure learning.

Unit Names

When teachers are about to embark on designing a school or district's horizontally and vertically aligned curriculum it is highly recommended that unit names are determined within a discipline (or, if appropriate, across disciplines) *prior to* or *early on* in the design process before teachers get in the habit of naming units in creative ways that make it difficult for map readers to easily identify what learning is in focus within a unit of study. An inability to recognize a unit's emphasis by the unit name makes it difficult to effectively use a mapping system's search and report features intended to aid teachers in conducting curriculum reviews.

It is therefore recommended that a school or district's generated unit names include *unit name signifiers* that serve as pseudo binders on shelves that help map readers recognize what is contained within the units of study in a particular course or series of courses. Unit name signifiers also create a higher likelihood that map readers will be able to locate the desired learning when conducting searches within a mapping system.



While there does need to be some flexibility and freedom in naming units of study within a discipline (or interdisciplinary), it is beneficial when there is collaborative agreement on key unit name signifiers that will extend across the grade levels K-12, or up to a learning point wherein students are no longer engaged in general studies. In this case, for specialized courses that are most often found in middle schools and high schools, such as advance placement courses (e.g., AP Microeconomics) or electives (e.g., Yearbook I, Yearbook II; Regional Current Events), the course's designers will develop unit name signifiers that express the specific learning focuses within a given course or series of courses.

Given that curriculum mapping is a field of study and therefore naturally evolves, over the years the importance of unit names as a critical component in organizing and managing a learning organization's curriculum has evolved.

Hale (2008) mentions the use of Roman numerals after unit names to indicate a particular focus is being revisited throughout a given school year (e.g., NUMBER SENSE I; NUMBER SENSE II; NUMBER SENSE III / VOCABULARY I; VOCABULARY II; VOCABULARY III). While this method for locating units of study works well, based on input from numerous teachers who discovered when using their selected mapping system that some report results listed only the unit names, they found that the Roman numerals did not provide insight into the deeper focus within the units. To reveal this information a unit of study had to be opened and visually scanned. They felt this "extra step" was time consuming. Their solution was simple—include a short, concise descriptor after a unit name to inform map readers of the specific focus(es) within the unit. Likewise, a variety of teacher teams shared their desire to have across-grade-level unit names that would serve a dual purpose. One, organization; and two, provide evidence of broad or universal themes that reoccur vertically over a series of academic years wherein each theme emphasizes specific big ideas or enduring understanding that enable students to see connections among and between what is learned over time. From these two examples as well as other in-the-field experiences and input from teachers, the development and incorporation of unit name signifiers was born.

Unit name signifiers, written to the left of a colon, either use a) the actual standards document's discipline-specific topic or theme terms or phrases used in the first or second level of the narrowed-down learning, such as:

- *NUMBER SENSE*: COMPUTATION
- *PROBABILITY/STATISTICS*: TRIALS/RESULTS
- *GEOGRAPHY*: SOUTH AMERICA
- *ECONOMICS*: NORTH AMERICAN TRADE
- *LANGUAGE*: CRITICAL ANALYSIS
- *PERSONAL HEALTH*: DRUG AWARENESS
- *ARTWORLDS*: 1920s CONTRIBUTIONS
- *CONSERVATION*: SOIL/WATER EROSION

or b) universal themes that utilize a key term representing generalizations that are not necessarily explicitly included in a standards document. A universal-theme unit name signifier calls attention to big ideas or enduring understanding embedded into the students' learning during a given unit of study. Erickson (2007) defines a generalization as "two or more concepts stated in a relationship …. that can be tested against, and supported by, the facts" (p. 31). A universal theme and its generalization(s) aid students in synthesizing their learning in such a manner that causes them to transfer their prior knowledge to new knowledge as well as apply logic, thought, and reasoning to expand their personal understanding.

For example, a teacher team may decide that a universal theme, *systems*, will ask students to revisit and expand their understanding of the generalization, *the interaction or interdependency of the parts of a whole affect the whole,* over a series of academic years. This generalization can be applied to the solar system, biomes, and cells, which are the three focuses written on the binders illustrated on the previous page. While each unit of study focuses specifically on certain topics and facts, the generalization can be woven through all three units of study whether the units take place in one academic year or are spread out over a series of academic years.

Here are a more examples of unit name signifiers that apply well to the notion of universal themes:

- *GOVERNMENTS*: 1776
- *CYCLES*: SEASONS
- *STRUCTURES*: PYRAMID DESIGN
- *PERFORMANCES*: SPRING DANCE RECITAL
- *EVOLUTION*: VOLCANOES
- *GLOBAL CONNECTIONS*: HOLIDAYS
- *ETHICS*: INTERNET PIRACY
- *RELATIONSHIPS*: PROFESSIONAL BEHAVIORS

(Note: It is recommended that unit names are written in all capital letters in a mapping system. The unit name signifiers in the examples above are italicized for emphasis only. Unit name signifiers are not italicized in units of study within a curriculum map.)

Whether using terms or phrases directly from a standards document or by developing universal themes, as previously mentioned, a unit name signifier appears to the left of a colon. A specific term or phrase descriptor that expresses a unit of study's specific focus or focuses is written to the *right* of the colon.

Unit name signifiers for a discipline's general courses are meant to stay consistent in and across grade levels. The descriptor to the right of the colon may change horizontally during a given school year as well as vertically through two or more academic years. There may be times when additional unit name signifiers are necessary for a particular grade or course. Likewise, electives or other types of courses outside of general studies will have unit name signifiers unique to a course or series of courses. The same is true for courses based on interdisciplinary units of study.

How teachers select or develop the key unit name signifiers varies depending on if the desire is to use the terms or phrases directly from the standards document or develop universal themes that may not be specifically mentioned in the standards document.

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The following two discipline-specific examples illustrate how differently teachers can approach the unit name signifiers decision-making process.

Middle School/High School Social Studies

A middle school and high school's social studies departments had never worked together before as a vertical across-schools team. They were coming together for the first time to begin the process of designing Grades 6-12 articulated student learning. During the first meeting their goal was to determine key unit name signifiers they would use as pseudo binders to house the students' planned learning taking place on both campuses.

They began the task by first listing the current units of study on the *right* side of a two-column chart starting with Grade 6 and finishing with Grade 12. When listing them they held each other accountable for making certain that the units listed were based on standards connections rather than chapters in the current adopted textbooks.

When reviewing their generated list they immediately noticed some vertical-like unit focuses, such as Ancient Mesopotamia. This unit of study appeared in Grade 6, Grade 8, and Grade 10. They did not immediately jump to conclusions that these like units were redundant; rather they simply took note of this fact and moved on to the next step in their task.

They brainstormed potential universal themes based on the notion that they would be formulating generalizations to be emphasized in one or more of the listed units of study. They wrote their generated universal themes on the *left* side of the chart. Someone in the group mentioned that the team should look at the National Council of Social Studies (NCSS) thematic strands and consider them as potential universal themes for their students' learning. They went online and looked up the NCSS Website. They read through the NCSS thematic strands:

- Culture
- Time, Continuity, and Change
- People, Places, and Environment
- Individual Development and Identity
- Individuals, Groups, and Institutions
- Power, Authority, and Governance
- Production, Distribution, and Consumption
- Science, Technology, and Society
- Global Connections
- Civic Ideals and Practices

and compared them to their generated potential unit name signifiers. They added some or parts of some of the NCSS thematic strands to the brainstormed themes on the left side of the chart.

After collegial discussions, debates, and trial and error regarding wording, the social studies team agreed upon nine unit name signifiers:

- EXPLORATION
- CONFLICT AND GREED
- GOVERNMENTS
- SOCIETAL STRUCTURES
- INFLUENTIAL FORCES
- POWER AND CHANGE
- INNOVATIONS/INVENTIONS
- HUMAN/PHYSICIAL GEOGRAPHY
- GLOBAL CONNECTIONS

Next they compared the finalized key unit name signifiers on the left side of the chart to each unit of study's focus or focuses on the right side of the chart. They had an "ah-ha" moment when they recognized that in most cases the units of study could "work" using any one of the unit name signifiers.

Jacobs (1997) addressed this important facet of unit design when sharing a teacher's thoughts while contemplating what 6th graders should focus on during a U.S. Constitution unit study, "What are the *most important concepts* that my students should investigate about the Constitution in four weeks? What should they *remember* and *reflect on* a year from now?" (p. 26, emphasis added).

The most important concepts is what a teacher team must decide when selecting a unit name signifier that *best represents* the enduring understanding or big ideas for a particular unit of study given a) the students' maturation and prior knowledge; b) the grade level and/or course's aligned standard statements; and most importantly, c) the desired outcomes, including performance and/or product assessments, that afford students the opportunity to apply the unit name signifier's generalization(s) to the current and prior learning.

For example, if the teacher Jacobs referred to was posing these questions while meeting with his social studies department while designing Consensus Maps, a collegial dialogue may center on whether the U.S. Constitution (topic recorded to the right of a colon) should be contained within a unit name signifier's "binder" entitled *governments* wherein the department's created generalizations include:

- Governments aid systems in functioning by establishing and monitoring rules and regulations.
- Governments affect political, military, and economic decision making.

Or should the unit be contained in a "binder" entitled *power and change* wherein the created generalizations include:

- Power by a single person or group may be used or abused.
- Changes influenced by power may or may not be in the best interest of a particular people's way of life.

While there is not a wrong answer, the choice of *governments* versus *powers and change* definitely influences the unit of study's design regarding content, skills, and assessments given the chosen unit name signifier's generalizations.

The middle school/high school social studies teacher team working together for the first time realized at the end of their initial meeting that they needed time to personally reflect on each agreed-upon unit name signifier's potential generalizations and then come back together to collaboratively determine each signifier's generalizations (big ideas/enduring understanding) before they could make quality decisions regarding each current unit's appropriate signifier the unit's focus in relationship to the signifier's generalizations.

The team also recognized the need to worked together to analyze the explicit and implicit learning expectations for the currently aligned standard statements since they a) had never done this before as one school, let alone two schools working together; and b) the newly established generalizations for each unit may causes a shift of standard statements from on unit to another or the addition or deletion of others.

Before leaving the initial meeting the team worked out a meeting schedule based on district-provided professional development days as well as meeting half-days using substitutes that were being provided by their principals.

During a later meeting when they focused on the Ancient Mesopotamia units of study, the teacher team decided that Grade 6's unit name signifier would be *human/physical geography* due to a strong emphasis on the role of the Nile and its affect on culture and lifestyle; Grade 8's unit name signifier would be *power and greed* due to a strong emphasis on various dynasty's Pharaohs, Queens, and significant leaders in Upper and Lower Egypt; and Grade 10's unit name signifier would be *innovations/inventions* due to an emphasis not only on the development of utilitarian tools and royal extravagance, but connections between how inventions and innovations of this time period still influences present-day living.

Elementary Mathematics

An elementary school's faculty decided to first focus on designing K-5 mathematics Consensus Maps. During a beginning-of-the-school-year faculty meeting including 15 teachers, two mathematics coaches, and three special education teachers responsible for teaching mathematics, they decided their first point of agreement needed to be a focus on the development of unit name signifiers. It did not take them long to come to agreement that the signifiers (written to the left of a colon) should come directly from their state mathematic standards document (e.g., Number Sense; Probability/Statistics; Algebra; Geometry). They also decided that the unit name descriptors to the right of a colon will be the key focus(es) for a given month or months since some unit name signifiers would be used for a series of units that will extend through all or most of the academic year, such as number sense (e.g., NUMBER SENSE: ADDITION / NUMBER SENSE: MIXED COMPUATION / NUMBER SENSE: PLACE VALUE / NUMBER SENSE: FRACTIONS). They also came to agreement on not using the mathematics strand *problem solving and logic* as a key unit name signifier. Instead they planned to break apart this strand's standard statements to determine the explicit/implicit learning expectations and then embed the agreed-upon expectations into the topic-driven units of study.

The longest conversation involved what standard mathematics strand to begin the breaking apart the standards K-5 process with given the reality that they:

- did not have any prior standards-based curriculum documents beyond a few months of practice Projected/Diary Map units recorded to learn the wording, format, and intra-alignment for writing quality maps with *curriculum design in mind*;
- knew they needed to design horizontal and vertical curriculum not based or dependent on the current adopted textbook and kits—instead based on state, and if appropriate, national mathematics standard statements;
- most importantly, were conscious of being "beginners" at designing standards-based curriculum and felt they needed to work collegially, not only in their individual grade levels, but across the grade levels.

They came to agreement that *less is more*. In other words, to not overwhelm their learning process they decided to start the breaking apart standards procedure with the Algebra strand since this strand contains five to seven standard statements per grade level versus the Number Sense strand that has 25 to 43 standard statements per grade level. Due to this large number of standard statements they decided to save Number Sense for the second-to-last strand to break apart since they knew by then they would intellectually and emotionally be ready to handle such an involved strand. The last strand they will break apart is the problem solving and logic standard statements and, as planned, incorporate the agreed-upon learning expectations into the created units of study.

The teachers created a meeting times plan that allowed for horizontal grade-level meetings as well as vertical mini-grade-level span meetings for the remainder of the school year based on the districtwide twice-a-month, half-day early release schedule wherein this first year of its implementation the two days per month were to be used for curriculum work per individual school site's action plans.

Near the end of the school year the teachers conducted a final K-5 vertical articulation of the drafted Consensus Maps before they began incorporating the planned-learning expectations into their instructional plans for the next school year.

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There is a contrast to the complexities of the social studies middle school/high school team's unit name signifiers versus the simplicity in the elementary school process. The point in illustrating the differences between these two teacher teams and disciplines is that teachers have to make the process their own. While both teacher teams began with determining key unit name signifiers, they approached the how-tos differently. It is important to note that these two examples took place in one school or among schools wherein there is a need for Consensus Maps, but not Essential Maps, which are necessary when a learning organization has multiple *like* schools. Regardless of the type or types of collaborative planned-learning map a learning organization needs, it is wise to be proactive regarding the development of key unit name signifiers.

In the beginning stages of mapping, teachers start by learning how to personally write a quality map regarding wording, format, and intra-alignment with design in mind. This is most often accomplished by having teachers practice recording Projected/Diary Maps for one discipline (elementary) or course (middle school; high school; specialist). During this time unit name signifiers are not as critical, although having them early on can be beneficial to the teachers as learners and curriculum designers.

Since a learning organization knows it will at some point have teachers designing collaborative Consensus Maps and/or Essential Maps it is therefore recommended that K-12 district (or appropriate grade-level span, such as a K-8 school district) discipline-specific *task forces* are *temporarily* formed to develop key unit name signifiers for each discipline *early on* in a curriculum mapping. This saves both time and frustration for teachers when recording personal Projected/Diary Maps as well as when they begin to collaboratively begin designing the planned-learning curriculum in and across grade levels. For learning that goes beyond a discipline's K-12 general courses, teachers of these courses (who may or may not be a part of the temporary task force) work together to design appropriate unit name signifiers for these courses.

Temporary task force members need to realize up front that there will be challenging moments when developing a discipline's (or interdisciplinary) key unit name signifiers. For example, English/Language Arts has its own challenges that stem from its multi-faceted learning expectations including subjects (reading, writing, listening, speaking), processing skills, genres, fiction versus nonfiction text types, etc. Therefore, it is important that those asked to be a part of a discipline's task force have a strong knowledge base and understanding of the discipline in focus.

Conclusion

Before focusing on the breaking apart standards procedure, it is important to note that while much of this section was focused on standards documents and the importance on developing unit name signifiers, there are a variety of variables and factors that can affect all aspects of curriculum design including:

- a general versus in-depth familiarity and understanding of the standard statements in focus before the design process begins;
- preexisting units of study the teachers have designed that are not *the* textbook or based heavily on what is included in a given textbook;
- preexisting scope and sequences wherein teachers have placed standard statements verbatim into quarter, semester, or month blocks but have not yet broken apart the standards to come to agreement on explicit/implicit learning expectations and translating the expectations into content and skill statements within a curriculum map;
- teachers' capabilities for working together collegially and attentively;
- adequate time to work (e.g., full or half days versus trying to find a half-hour here and there);
- professional development and support for the mapping process in general as well as learning the processes and procedures involved in designing collaborative maps in general as well as within the selected mapping system.

THE BREAKING APART STANDARDS PROCEDURAL STEPS

As shared previously, unit names serve as invisible binders on shelves that provide a design framework for housing the planned-learning expectations. The breaking apart standards procedure aids in ensuring the content and skill statements within a unit of study or series of units include the detailed learning that the teachers have agreed upon based on analyzing the explicit and implicit expectations involved in the standard statements aligned to the existing or newly developed units.

During the process of designing units of study it is important to remind teacher teams to not use current adopted textbooks, kits, or programs as the framework for the planned learning. Consensus Maps and Essential Maps are meant to reflect learning based on timelessness, not a current adopted series or program. In step three, information regarding current textbooks, kits, and materials, such as chapters or workbook pages *available to all those teaching the course* may be added as *resources* if a teacher team chooses to do so.

Step One

Two non-negotiable elements in a curriculum map's units of study are content and skills. Content is what students must *know* and written with design in mind as a noun/noun phrase and a descriptor:

- 2-Dimensional Shapes: Triangle, Square, Rectangle, Pentagon
  Noun Phrase *Descriptor*

- Point of View: Third Person Omniscient/Limited
  Noun Phrase *Descriptor*

- Automotive Drive Train: Transmission, Driving Axles, Universal Joints, Drive Shaft
  Noun Phrase *Descriptor*

Skills are what students must *do* in relationship to the knowing and have three parts with design in mind when writing skill statements: measurable verb-target-descriptor.

- Identify visually and in writing given shape based on its attributes: lines, corners, angles

Measurable Verb *Targets* *Descriptor*

- Jusitfy in writing author's omniscient view of main character using at least 5 contextual clues

Measurable Verb *Target* *Descriptor*

- Identify visually and manually number of axles connected to transmission based on number of wheels based from side view of vehicle

Measurable Verb *Targets* *Descriptor*

In a Projected/Diary Map, an individual teacher's personal map reflecting the planned and operational curriculum in a given school year, the use of *targets* is critical in connecting *how* each skill is formally measured. This is visually indicated within a unit by the aligned skills and assessments. If a target states:

- Create *manipulatively* core pattern and extend pattern 2 times

an inappropriate aligned assessment would be a written test. An appropriate aligned assessment would be a performance task wherein students truly manipulated objects to create the patterns.

In a planned-learning collaborative Consensus Map or Essential Map, the use of targets is *up to the discretion of the teacher teams* designing the courses. Oftentimes, even if a teacher team designs a school-site Consensus Map and chooses not to include assessments (in other words, will leave the measurements and evaluations of content-skills learning up to the autonomy of the individual teacher), most teachers do choose to include targets in the skill statements to indicate, at a minimum, how the skills are to be formally measured. Teacher teams designing Essential Maps may choose to not include targets and allow school-site autonomy concerning how learning will be measured. There may be times though, given a district's design directive, that targets are included to inform teachers at the school sites how the learning needs to be formally measured.

The reason for taking a moment to mention the purpose of targets is that this guide is focused more so on the breaking apart standard procedure related to coming to agreement on the explicit/implicit content-skill statements learning expectations. The inclusion of targets within the skill statements will need to be a discussion and decision made by the teacher teams involved in the design process, or at times, based on a district administrative directive.

In step one the focus is on a teacher team first breaking apart each standard statement that is involved in the planned learning in general or within a specific unit of study to reveal the *explicit* nouns, verbs, targets, and descriptors. To visually represent the explicit learning in each statement, the statement's text is highlighted using specific criteria. Some teachers prefer to literally use colored highlighters, while others prefer to use a pen or pencil method (Figure 1.2).

Some teachers prefer to conduct the highlighting process individually before meeting as a team while others prefer to work on the coding process together. Regardless of choice, commentaries and questions are recorded when the team discusses the highlighted text regarding the explicit learning and begins to raise questions concerning the potential implicit learning (which is addressed in detail in step two).

Figure 1.2 Breaking Apart Standard Statement Coding

Skills	Content or Concept	Targets or Descriptors
Highlighter Color #1 *(use broad side of highlighter)* or **Draw a Box Around Text**	**Highlighter Color #2** *(use broad side of highlighter)* or **Draw a Circle Around Text**	**Highlighter Color #2** *(use tip point to underline text)* or **Draw a Line Under Text**
Verb Relating to Student Action or Ability	Key Noun or Noun Phrase	*Text Providing Specific Details in Relationship to Content or Skills

*Sometimes a standard statement includes text that has an abbreviation directly in front of the information:

- If the text is preceded by *e.g.,* which in Latin means *for example*, it indicates that the learning term or terms are considered *not* compulsory unless otherwise indicated in the standards document. Teachers may or may not choose to include the expectations as required learning.
- If the text is preceded by *i.e.*, which in Latin means *that is*, it indicates that the learning term or terms *are* compulsory and must be included as a required learning expectation.
- If *e.g.* or *i.e.* is not written prior to a target or descriptor it is equivalent to *i.e*. and considered required learning.

Here are a few discipline-specific examples that provide a visual breakdown of a standard statement followed by teacher commentaries in italics.

- Compare structures in plants (e.g., roots, stems, leaves, flowers) and animals (e.g., muscles, bones, nerves) that serve different functions in growth and survival.
    - *There is a lot of learning involved here. Given this is a school-year's worth of learning, we need to decide what month or months we'll focus on plants versus animals, and eventually focus on both in one unit. What are the "different" functions expected to be learned since they are not stated? "Serve" how? Since there are all e.g.s for the descriptors are we going to stay with these and expand or include different ones altogether?*

- Identify models or illustrations of prisms, pyramids, cones, cylinders, and spheres.
    - *Pretty clear cut as far as what students must know including descriptors. The doing (ability) is not very high-level cognition (identify). We may want to consider higher level thinking skills. What specific characteristics will we include regarding attributes of each shape: faces, edges, vertices…? We may want to consider comparisons of concept of planes (2-D versus 3-D) even though it is not in our academic year since it is heavy in the following year's standards. Will models and illustrations include studying real objects and/or drawn objects? Are we going to bring technology into these learning expectations? If yes, how?*

- Recognize how art (e.g., porcelain, poetry), architecture (e.g., pagodas, temples), and inventions (e.g., paper, fireworks) in Asia contributed to the development of their own and later civilizations.
    - Recognize *infers that students are going to have to compare, contrast, and make connections based on descriptors such as* their own *and* later. *What "later" civilizations should we have students compare to and make connections with? (Note: Check social studies standard/maps.) Should we consider changing how we've been teaching this standard to reflect an interdisciplinary unit of study given we can base the art,*

architecture, and inventions studied on time periods and connect with social studies as well as science? We could have students comparing contemporary Asian influential artisans and inventors to a specific era or eras.

- Construct a paragraph that groups sentences around a topic.
    - *Only one paragraph? We really need to get students to three paragraphs given the next grade level's state testing requirements. Do we need to agree on how many sentences are considered adequate for a paragraph? Do we need to update our rubric? What is really meant by "groups" sentences around?*

- Use estimation to verify the reasonableness of a calculation (e.g., Is 4.1 x 2.7 about 12?).
    - *This statement should read:* Verify in writing reasonableness of a calculation using estimation *so that the skill learning begins with a measurable verb. Will we be testing using word problems or numeric problems? What will our expectations be when they write a verification? Is there a concept or concepts involved in this learning that is not explicitly stated that we can connect to the reasoning and logic strand?*

While the last example's teacher notes indicate wording appropriate for writing a map skill statement, this step is not meant to focus formally on translating broken apart standard statements into actual map element configurations. This is done in the latter part of step two. Step one is meant to be a time of both *personal* and *collaborative* reflection on the explicit learning expectations as well as beginning to consider the implicit learning within the standard statements.

Step Two

Based on the results of step one's breaking apart the standard statements and commentaries, a teacher team begins discussing and determining the following curriculum design points:

1. What exactly are each statement's *implicit* learning expectations? In other words, what do students have to specifically *know* and be able to *do* that are *inferred* in order for a student to *independently* master or move toward mastery of the statement(s) explicit expectations? Is there any learning that is not even implied or inferred *yet needs to be explicitly determined?* For example, in the relational probability standard statements below (Figure 1.3) none of the six statements explicitly indicate a descriptor regarding *number of trials*. It only includes the phrase *grade-level appropriate* probability experiment. Since multiple grade levels standard statements use this same phrase in relationship to probability experiments it is critical for grade-level design that a quantity or range is explicitly determined and appropriately included within the vertically aligned curriculum maps.

Figure 1.3 Probability Standard Statements

Understand and apply the basic concepts of probability
• Name the possible outcomes for a probability experiment. • Predict the most likely or least likely outcome in probability experiments (e.g., Predict the chance of spinning one of the 2 colors on a 2-colored spinner.). • Predict the outcome of a grade-level appropriate probability experiment. • Record the data from performing a grade-level appropriate probability experiment. • Compare the outcome of an experiment to predictions made prior to performing the experiment. • Compare the results of two repetitions of the same grade-level appropriate probability experiment.

2. What standard statement or statements do not include a measurable verb? The team needs to determine appropriate measurable action or ability verbs to replace non-measurable verbs. For example, an Agriculture Science standard statement reads:

    - Demonstrate an awareness of the importance agriculture has had on the development of the United States as a society

    Demonstrate in and of itself is not measurable … And an awareness of what? This is a statement wherein teachers' determination of the students' *cognitive outcomes* will influence the decided-upon implicit verbs, as well as descriptors related to the awareness requirement, that will eventually be written as explicit skill statements in a curriculum map. For example, a teacher team may eventually agree that the implicit student learning will include:

    - *Justify* evolution of livestock ranching with a specific focus on advancements from 1800 to present day
    - *Compare and contrast* pesticides usage before and after state and federal government regulations were enacted
    - *Hypothesize* future horticultural trends based on current statistical data

    As teachers develop the specific expectations based on the implicit learning there will eventually need to be discussions pertaining to how the content-skills expectations will live within units of study a) given the course's unit name signifiers; and b) whether the learning will be included in individual one in-depth unit or a series of relational units.

    Another example regarding the need for skill statements to begin with measurable verbs is the non-measurable verb *use*. A reading standard statement states:

    - Use information from text and text features to determine the sequence of activities needed to carry out a procedure

    Determine the sequence… is actually the explicit measurable verb in this standard statement. A teacher team will need to decide if an additional verb or verbs that represent specific actions or abilities are necessary. Based on inferences that can be made in this standard statement, potential measurable verbs may include *Sequence...; Construct…; Analyze…*. While the beginning of this standard statement is an explicit descriptor, the teachers agree it is vague and become more detailed in their generated skill statement (e.g., illustrations and/or photographs):

    - Determine 4-7 procedural sequences using information based on text features: illustrations, photographs

3. If a standard statement's verb or verbs are measurable but the team believes the expectation or expectations are at a lower level of cognition, the team may choose to develop appropriate higher-level thinking measurable-verb skill statement(s) to be included in a unit or units of study. For example, a Grade 5 geography standard statement reads:

    - Define and give examples of natural hazards, such as hurricanes, tornadoes, and tsunamis

    A teacher team decided the verb *define* and *give* are low level and developed skill statements that demand higher-level thinking. Likewise, they agreed that there needed to be scaffolded learning included as descriptors in their developed skill statements. The teachers also chose to include other natural hazards since *such as* is the equivalent to e.g. (for example):

    - Correlate Earth scientists use of satellite imagery to creating theories of causes and effects of natural hazards

- Analyze crops and drought patterns in decade increments in the United States, Africa, and Asia to determine similarities/differences related to geographical location and weather consistencies or inconsistencies

4. A broken apart standard statement may or may not include explicit descriptors. To design a rigorous, spiraled curriculum both horizontally and vertically curriculum maps *must contain clear expectations* regarding both content and skill statement descriptors. While this is critical for learning expectations that appear in a stand-alone unit, it is imperative when similar learning appears in a series of units that occur within one academic year or spiral over a series of years.

   If a standard statement contains vague or no descriptors a design team will need to come to agreement on appropriate descriptors that will be written explicitly in a course's curriculum map. The following is an example of a first grade team's design focus for a specific standard statement that they wanted to include in a spiraled series of *number sense* strand units of study that will occur throughout the academic year. The standard statement is:

   - Read and write numbers up to 100

   State testing is administered mid-April. To ensure success for all students the teachers agreed that each student must independently master all that is involved in this standard statement no later than the end of March. The teachers then used a backwards design planning model regarding both the *explicit* and *implicit* content-skills learning requirements for this standard statement that they determined using step one and step two of the breaking apart standard process. Based on what they want the students to know and able to do by *April* they created *incremental* stages of expectations.

   When they had drafted their units they conducted an informal curriculum review with kindergarten and second grade regarding their planned learning. Based on input from the vertical review they made slight modifications to the draft and began to input the data in their mapping system starting with September as it is the first month of the school year.

   As you will see by reading the unit's incremental learning (Figure 1.4), the teachers worked collaboratively to determine the *specific descriptors* in both the content and skill statements. In other words, the teachers included explicit descriptors *not mentioned* in the standard statement pertaining to a) the *range of numbers* involved in the content learning; and b) *specific* skill statement expectations (i.e., *numeral*; *number word*; *in sequence*; *in isolation*) that expand or change over time. The teachers also decided for the measurable verb *read* they would include a target (*orally*) until mid-year when they expect students to read silently (not written in the map as a target) and write responses based on *combining* this skill with one or more skill statements in the unit of study. While the teachers did choose to include a target, they chose not to include assessments in their Consensus Map during the first year of implementation.

Figure 1.4 Grade 1 Mathematics Consensus Map Excerpt
(Note: This figure is an excerpt and therefore does not include other content/skill statements that are involved in these units of study, such as sets, place value, and fractions.)

Mon	Content	Skills	Standards
Sept	**NUMBER SENSE: NUMERALS** A. Number Recognition: 0–25	A. Read orally numerals in sequence and in isolation A. Write numerals in sequence	A. Read and write numbers up to 100 (I)
Oct	**NUMBER SENSE: NUMERALS** A. Number Recognition: 0–50	A. Read orally numerals in sequence and in isolation A. Write numerals in a 5- to 10-number sequence starting with any given number and in isolation	A. Read and write numbers up to 100 (D)

Nov	**NUMBER SENSE: NUMERALS** A. Number Recognition: 0–50	A. Read orally numerals in sequence and in isolation A. Write numerals in a 5- to 10-number sequence starting with any given number and in isolation A. Write number words zero to ten in sequence and in isolation	A. Read and write numbers up to 100 (D)
Dec	**NUMBER SENSE: NUMERALS** A. Number Recognition: 0–50	A. Read orally numerals in sequence and in isolation A. Write numerals in a 5- to 10-number sequence starting with any given number and in isolation A. Write number words zero to ten in sequence and in isolation	A. Read and write numbers up to 100 (D)
Jan	**NUMBER SENSE: NUMERALS** A. Number Recognition: 0–75	A. Read numerals and in sequence and in isolation A. Write numerals in a 10- to 20-number sequence starting with any given number and in isolation A. Write number words zero to twenty-five in sequence and in isolation	A. Read and write numbers up to 100 (D)
Feb	**NUMBER SENSE: NUMERALS** A. Number Recognition: 0–100	A. Read numerals in sequence and in isolation A. Write numerals in a 10- to 50-number sequence starting with any given number and in isolation A. Write up to 3 missing numerals in a series of numerals not to exceed 10 starting with any given number A. Write number words zero to fifty in sequence and in isolation	A. Read and write numbers up to 100 (D)
Mar	**NUMBER SENSE: NUMERALS** A. Number Recognition: 0–100	A. Read numerals in a 10- to 100-number sequence starting with any given number and in isolation A. Write numerals in a 10- to 100-number sequence starting with any given number and in isolation A. Write up to 3 missing numerals in a series of numerals not to exceed 10 starting with an given number A. Write number words zero to seventy-five in a 10- to 20-number sequence starting with any given number and in isolation	A. Read and write numbers up to 100 (M)
Apr	*A spiraling unit was not included in this month.*		
May	**NUMBER SENSE: NUMERALS** A. Number Recognition: 0–125	A. Read numerals in a 10- to 100-number sequence starting with any given number and in isolation A. Write numerals in a 10- to 100-number sequence starting with any given number and in isolation A. Write up to 5 missing numerals in a series of numerals not to exceed 10 starting with an given number A. Write number words zero to one hundred in a 10- to 20-number sequence starting with any given number and in isolation	A. Read and write numbers up to 100 (R)

5. As observed in the example above, the teachers had to determine the number-range expectation that increased over time. Content-specific descriptor expectations may not be explicitly included in a standard statement or series of statements, especially when considering the need to scaffold learning in increments, stages, or with an increasing complexity to the learning. Coming to agreement on what students are literally expected to know (noun/noun phrase: descriptor) may be necessary especially when standard statements are broad or vague. For example:

    - Recognize different types of visual media

    Visual media can be interpreted in a variety of ways given the acceleration of technology in the 21st century. Likewise, the vague descriptor *different types* can lead to varied interpretations. A teacher team responsible for ensuring that students independently meet the expectations of this standard statement will need to come to agreement on what students must *specifically* know given the grade level, prior knowledge, and relational standard statements and translate the explicit/ implicit expectations into content descriptors, such as:

    - Visual Media: Video Sharing Websites
    - Visual Media: Handheld Game Console

During collaborations focused on the five points involved in step two, there is a strong possibility that teachers will need to review relational standard statements both above and below their focused-on grade level or course to aid in their decision-making process.

Be aware that step two (and step three) takes time. If standards-based curriculum design and establishing procedures for designing units of study is a new concept for teachers, plan from the onset to allow teachers time to engage in *multiple* collaborative meetings. Just as with any new learning all that is being asked of teachers to cognitively process and make sense of including personally and collectively synthesizing and applying this new or expanded knowledge can feel, at times, overwhelming. The more teacher teams are afforded opportunities to work on their curriculum design, the more likely they will be to become comfortable with the process and making it their own.

Step Three

The third step involves officially translating the broken apart standards' explicit and implicit learning expectations generated by a teacher team into a curriculum map's elements within a mapping system. Some prefer to generate a first draft in a Microsoft Word document and later copy the information to their mapping system's curriculum-map template while others prefer to record the first draft within the mapping system from the onset.

Most teacher teams take copious notes during step two. It is then simply a matter of finalizing the planned-learning expectations for each unit of study and recording the expectations using quality map-writing wording, format, and intra-alignment for the detailed content and skill statements.

The following is a small design excerpt from a teacher team's breaking apart standards procedure regarding one specific standard statement as it relates to other standard statements they broke apart within the same science strand and eventually translated into a curriculum map format.

<u>A Translation Example</u>

An elementary school began their collaborative Consensus Map curriculum-design process. Before grade level teams began working on drafting their grade level's planned-learning expectations the teachers worked together to develop school-wide science unit name signifiers and generalizations using a combination of state science strands and universal themes.

Each grade level started with a focus on life science. Based on the state standards document, one grade-level team decided they would design a series of relational spiraling units that incorporated an every-other-month unit pattern that built on two unit name signifiers (*growth* and *survival*) and two specific topic focus (as well as a third for the last unit of study). Using this design model they believed students would be able to construct and expand their understanding over the course of the school year. Since there were no previous standards-based units of study to use as a base, the team broken apart a set of relational standard statements including one previously mentioned in step one:

- Compare structures in plants (e.g., roots, stems, leaves, flowers) and animals (e.g., muscles, bones, nerves) that serve different functions in growth and survival.

Based on their actions involved in steps one and two, the teachers made decisions regarding their units' design:

- Create a total of five spiraled units of study wherein the first four units focus separately on plants and animals and the last unit combines and extends previous learning with an additional focus on diseases:
    - GROWTH: PLANTS
    - SURVIVAL: PLANTS
    - GROWTH: ANIMALS
    - SURVIVAL: ANIMALS
    - GROWTH/SURVIVAL: PLANTS/ANIMALS/DISEASES

- Each unit's focus will include the concepts of *structures* and *functions*.
    - While the above broken apart standard statement does not mandate (e.g., not i.e.,) that students learn roots, stems, leaves, flowers as plant structures; nor does it mandate muscles, bones, and nerves as animal structures, the teachers decided to include these explicit learning expectations along with other plant and animal structures as the units of study spiral in complexity.
    - Since the above broken apart standard statement does not provide explicit learning regarding plant or animal functions, the teachers decided that the specific functions incorporated into the units of study (relating to growth and survival) would be determined based on the unit name signifiers' generalizations as well as analyzing the introduction of plant and animal functions in previous grade levels as well as expansions expected in future grade levels.
    - Specific structures will be included in the units of study as *content* descriptors and specific functions as *skills* descriptors.

- Based on the above broken apart standard statement, the teachers decided that before the students can *compare* they must first be able to *identify* and *explain*. The teachers decided that the *compare* skill expectation would be incorporated in the third unit of study wherein the students will begin to compare and contrast plant and animal growth.

- Since the elementary school teachers as a collective group came to agreement that all grade level's Consensus Maps will include targets in the skill statements, they would determine targets when considering the formative and summative assessments that could be used during each unit of study.

After a few meetings focused on drafting the series of units, the team recorded the units of study within the mapping system. Figure 1.5 represents a *small portion* of the teacher team's *first* unit of study.

Figure 1.5 Growth: Plants Unit of Study

Content	Skills
GROWTH: PLANTS A. Plant Structures: Roots, Stems, Leaves, Flowers	A. Identify in writing individual function of each structure: roots–absorb nutrients, stems–provide support, leaves–synthesize food, flowers–attract pollinators and produce seeds for reproduction A. Explain visually and in writing relational functions of each structure related to growth

For the first year of implementation the teachers decided that formative and summative assessments would be left up to the discretion of each classroom teacher. Therefore, no assessments would initially be included in the Consensus Map.

For the implementation year the teachers planned to meet periodically to discuss the effectiveness of the units of study within the map; review student work samples; and share the assessments and evaluations they individually chose to use. They predicted that revision to the Consensus Map for a second year of use would most likely include adding common or same assessments focused on their students' needs based on the results of state test scores from the newly mandated state science testing.

As a final step they added resources available to all of them including current textbook sections, materials, and kits to each unit of study.

The teachers still had two science focuses to plan out, physical and earth sciences. They followed the same process as they used for the life science units.

When all science focuses were drafted in the mapping system, not only for their grade level, but all the grades K-5, the full faculty conducted an official vertical review focusing on each unit of study's unit name (unit name signifier: descriptor) and intra-aligned content, skill statements, and standard statements.

Since curriculum mapping is an ongoing process, all the teachers realized that their curriculum design work and soon-to-be put into practice was not "done," rather just beginning. They appreciated the fact that they reached a monumental milestone as curriculum designers and deserved to celebrate their achievements!

Step Four

Once an academic year's Consensus Maps or Essential Maps have been recorded within a mapping system, as mentioned in the previous example, vertical review teams need to analyze the planned-learning curriculum for unintentional gaps, repetitions, or absences both horizontally and vertically.

During the first year of implementation a design team of any type of planned-learning map needs to periodically evaluate the effectiveness of the agreed-upon learning expectations. Changes to learning expectations can be made with *one* stipulation. If changes want to be made within a unit of study *before* the actual month the learning lives in the current calendar year, making revisions is acceptable and appropriate.

If a unit of study's learning expectations have already passed in real time the information within the map's unit *may not* be adjusted within the *current* school year's map. Adjustment notations need to be recorded either in a separate document or using a notes feature if included in the mapping system. Only *after* the curriculum map has been archived for the current school year and rolled over to the next school year can the desired adjustments can be made. This wait-to-revise protocol ensures accurate evidence of a course's planned-learning curriculum's evolution from year to year.

Conclusion

This guide is meant to provide insight and food for thought to spark collegial discussions regarding the processes and procedures necessary for supporting your standards-based, teacher-design curriculum model. How teachers interpret standard statements when designing curriculum is critical to improving students' learning. O'Shea (2005) observes:

> There is a distinct difference between alignment with the topics of the standards and achievement of the expectations included in the standards. Standards are written to raise expectations of students' intellectual engagement with the subject matter….Mere topic coverage, or the alignment of topics…does not ensure achievement of the higher expectations described in state standards. (p. 16)

Therefore, remember that standards themselves are not the curriculum. Erickson (2007) states:

> Academic standards are not a curriculum: they are a framework for designing curriculum. A curriculum is a coherent, teacher-friendly document that reflects the intent of the academic standards. When teachers mistakenly think that the state academic standards are the curriculum, they may start checking off benchmarks one by one, which can lead to pellet-gun teaching. (p.48)

Coherent, teacher-friendly documents that reflect the intent of the academic standards are curriculum maps that represent individual teacher-designed learning expectations (Projected/Diary Map) as well as collaboratively designed planned-learning expectations (Consensus Map/Essential Map). The standard statements aligned to the learning need to be analyzed for explicit and implicit learning requisites and translated into quality written content and skill statements to ensure student success.

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