Designing an Understanding-based Curriculum from Standards

presented by

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Key Understandings about...

-- Understanding --

• A primary goal of education is the development and deepening of student understanding of important ideas and processes within, and across, disciplines so that they can transfer their learning to new situations.

• Content needs to be "unpacked" to identify the big ideas worth understanding and the essential questions worth uncovering.

• Evidence of student understanding is revealed when students apply (transfer) their learning within authentic contexts.

• Six facets of understanding – the capacity to explain, interpret, apply, shift perspective, empathize, and self-assess – serve as indicators that students understand.

• Understanding must be "earned" by the learner. Teaching for understanding facilitates "meaning making" by the students and equips them to successfully transfer their learning.

-- Design --

• Effective curriculum development reflects a three-stage design process called "backward design." This process helps to insure that curriculum plans are well aligned and focused on desired learnings. Backward curriculum design also helps avoid the twin problems of "textbook coverage" and "activity-oriented" teaching.

• The backward design process can be productively applied to planning a single unit, a year-long course, and an entire K-12 curriculum.

• Regular reviews of curriculum and assessment designs, based on design standards, are needed for quality control to avoid the most common design mistakes and disappointing results.

• Educators can "work smarter" in curriculum design by working collaboratively and sharing ideas via electronic networks (e.g., the ubdexchange.org web site).

A Summary of Key Research Findings Supporting Understanding by Design

• Views of how effective learning proceeds have shifted from the benefits of diligent drill and practice to focus on students' understanding and application of knowledge.

• Experts' knowledge is organized... Their knowledge is not simply a list of facts and formulas that are relevant to the domain; instead, their knowledge is organized around core concepts or 'big ideas' that guide their thinking about the domain (e.g., Newton's second law of motion); it is "conditionalized" to specify the contexts in which it is applicable; it supports understanding and transfer (to other contexts) rather than only the ability to remember. Novices' knowledge is much less likely to be organized around big ideas; they are more likely to approach problems by searching for correct formulas and pat answers that fit their everyday intuitions.

• Learning must be guided by generalized principles in order to be widely applicable. Knowledge learned at the level of rote memory rarely transfers; transfer most likely occurs when the learner knows and understands underlying principles that can be applied to problems in new contexts. Learning with understanding is more likely to promote transfer than simply memorizing information from a text or a lecture.

• Skills and knowledge must be extended beyond the narrow contexts in which they are initially learned. For example, knowing how to solve a math problem in school may not transfer to solving math problems in other contexts. It is essential for a learner to develop a sense of *when* what has been learned can be used -- the conditions of application. Failure to transfer is often due to learners' lack of this type of conditional knowledge.

• Curricula that are a "mile wide and an inch deep" run the risk of developing disconnected rather than connected knowledge. Research on expertise suggest that a superficial coverage of many topics in the domain may be a poor way to help students develop the competencies that will prepare them for future learning and work."

• Feedback is fundamental to learning, but feedback opportunities are often scarce in classrooms. Students may receive grades on tests and essays, but these are summative assessments that occur at the end of projects. What are needed are formative assessments, which provide students with opportunities to revise and improve the quality of their thinking and understanding.

• Assessments must reflect the learning goals that define various environments. If the goal is to enhance understanding and applicability of knowledge, it is not sufficient to provide assessments that focus primarily on memory for facts and formulas. Many assessments measure only propositional (factual) knowledge and never ask whether students know *when, where,* and *why* to use that knowledge. Given the goal of learning with understanding, assessments and feedback must focus on understanding, and not only on memory for procedures or facts.

What is understanding?

Part 1 – How would you define "understanding"? What does it mean to "really understand" or "get it"?

Understanding:

Part 2 - What are concrete indicators of *really* understanding something (as apposed to merely knowing important facts about it)? What can the person with understanding do that the person with only knowledge—even lots of knowledge—cannot do?

Indicators of Understanding	***Indicators of Knowledge without Understanding***

Stage 1 – Desired Results

Established Goal(s): G

Understanding(s): U

Essential Question(s): Q

Students will know... K

Students will be able to... S

Stage 2 – Assessment Evidence

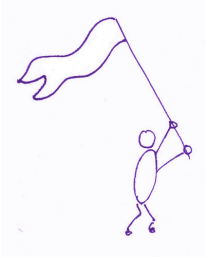
Performance Task(s): T

Other Evidence: OE

Stage 3 – Learning Plan

Learning Activities: L

STANDARDS



Definition

Standards specify established learning goals. A *content* standard provides a written description of what students should know and be able to do in a particular discipline or subject area. A *performance* standard specifies how well students need to perform in order to meet the standard.

Some standards are broad and overarching (e.g., *Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence*), while others are grade/level-specific (e.g., *Grade 4 – Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers*.)

Standards specify goals related to **content** (e.g., *Grade 6 – Write and evaluate numerical expressions involving whole-number exponents*) as well as **process** (e.g., *Make sense of problems and persevere in solving them*).

Recommendations

Standards are not curriculum; they provide the framework upon which curricula are developed. Educators must translate Standards into a teachable curriculum to insure a guaranteed set of desired results. Since Standards documents often contain a mix of knowledge, skills, conceptual understandings, transfer abilities and habits of mind, it is necessary to "unpack" them to clarify the desired results and develop appropriate assessments and instruction.

The Common Core Standards have been developed with long-term outcomes in mind (e.g., College and Career Anchor Standards in English Language Arts), and their components are intended to work together (e.g., Content and Practice Standards in mathematics). It is important for educators to understand the intent and structure of the Standards in order to work with them most effectively. Accordingly, I recommend that schools set the expectation and schedule the time for staff to read and discuss the Standards, beginning with the "front matter," *not* the grade-level Standards. Consider using the following essential question to guide staff reading and discussion: *What are the new emphases in these Standards and what do they mean for our practice?*

Areas of Emphasis
in the
Common Core State Standards

The Common Core State Standards in Mathematics

"…the mathematics curriculum in the United States must become substantially more focused and coherent in order to improve mathematics achievement .... To deliver on the promise of common standards, the standards must address the problem of a curriculum that is a mile wide and an inch deep. That is, what and how students are taught should reflect not only the topics that fall within a certain academic discipline, but also the key ideas that determine how knowledge is organized and generated within that discipline. This implies that 'to be coherent,' a set of content standards must evolve from particulars… to deeper structures inherent in the discipline."

-- Common Core State Standards for Mathematics

The Common Core State Standards in English/Language Arts

"Students can, without significant scaffolding, comprehend and evaluate complex texts across a range of types and disciplines, and they can construct effective arguments and convey intricate or multifaceted information. Likewise, students are able independently to discern a speaker's key points, request clarification, and ask relevant questions. They build on others' ideas, articulate their own ideas, and confirm they have been understood. Without prompting, they demonstrate command of standard English and acquire and use a wide-ranging vocabulary. More broadly, they become self-directed learners, effectively seeking out and using resources to assist them, including teachers, peers, and print and digital reference materials."

-- Common Core State Standards for English Language Arts

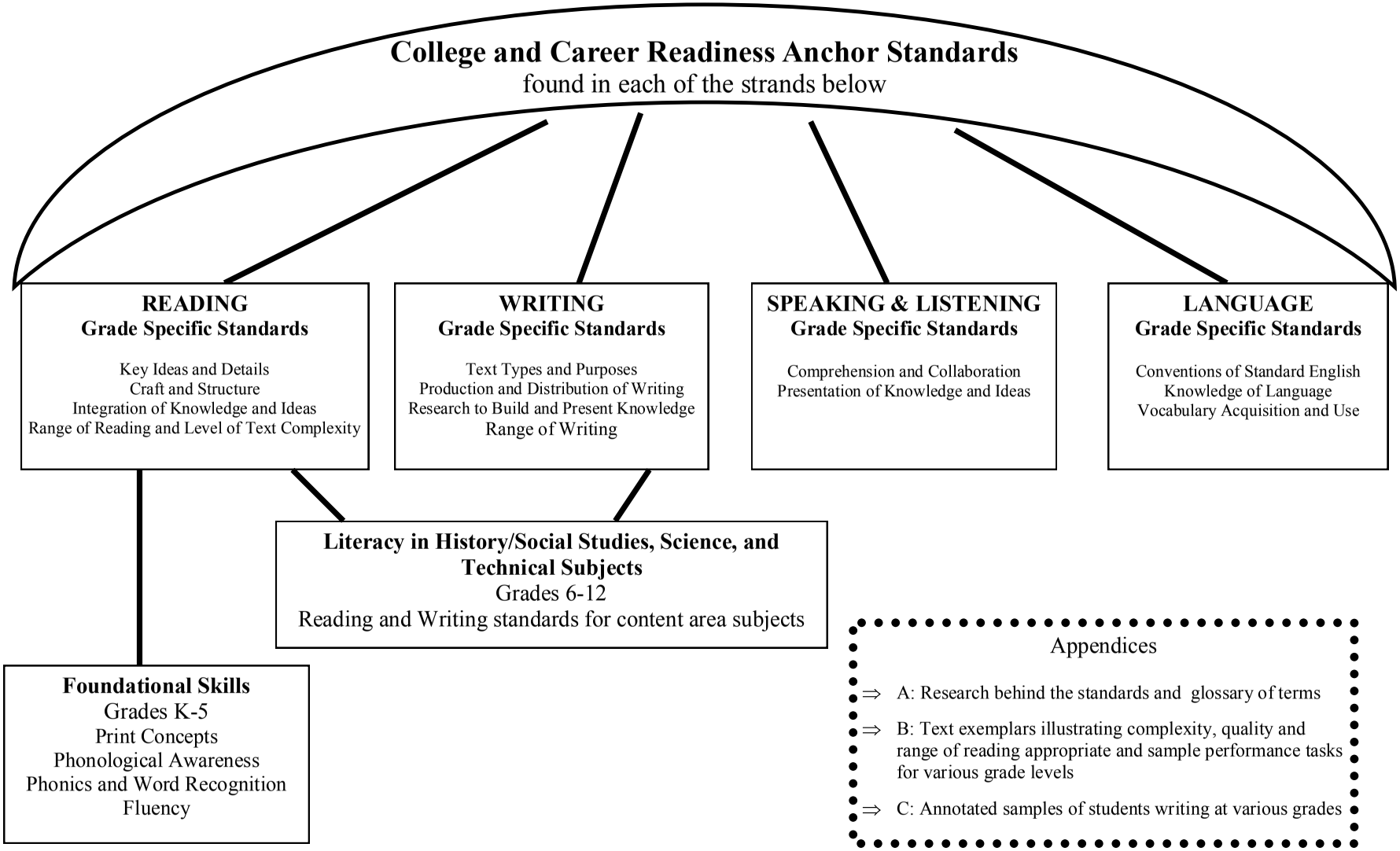
The (Draft) Common Core State Standards in Science

"The framework focuses on a limited number of core ideas in science and engineering both within and across the disciplines. The committee made this choice in order to avoid shallow coverage of a large number of topics and to allow more time for teachers and students to explore each idea in greater depth. Reduction of the sheer sum of details to be mastered is intended to give time for students to engage in scientific investigations and argumentation and to achieve depth of understanding of the core ideas presented. Delimiting what is to be learned about each core idea within each grade band also helps clarify what is most important to spend time on, and avoid the proliferation of detail to be learned with no conceptual grounding.

-- Common Core Science Standards (draft)

Common Core Standards

English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects



English Language Arts Standards
College and Career Readiness

Anchor Standards for Reading

Key Ideas and Details

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
3. Analyze how and why individuals, events, and ideas develop and interact over the course of a text.

Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.
5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.
6. Assess how point of view or purpose shapes the content and style of a text.

Integration of Knowledge and Ideas

7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
8. Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.
9. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

Range of Reading and Level of Text Complexity

10. Read and comprehend complex literary and informational texts independently and proficiently.

English Language Arts Standards
College and Career Readiness

Anchor Standards for Writing

Text Types and Purposes

1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
3. Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

Production and Distribution of Writing

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.
6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

Research to Build and Present Knowledge

7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Range of Writing

10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

Pedagogical Shifts Demanded by the ELA Standards

			Notes & Ideas
1	**Balancing Informational & Literary Text**	Students read a true balance of informational and literary texts.	
2	**Knowledge in the Disciplines**	Students build knowledge about the world (domains/ content areas) through *text* rather than the teacher or activities.	
3	**Staircase of Complexity**	Students read the central, grade appropriate text around which instruction is centered. Teachers create more time and space and support in the curriculum for *close* reading.	
4	**Text-based Answers**	Students engage in rich and rigorous evidence-based conversations about text.	
5	**Writing from Sources**	Writing emphasizes use of evidence from sources to inform or make an argument.	
6	**Academic Vocabulary**	Students constantly build the transferable vocabulary they need to access grade level complex texts. This can be done effectively by spiraling like content in increasingly complex texts.	

Source: ENGAGE NY

Common Core Standards for Mathematics

Introduction – Articulates the philosophical and conceptual foundation for the Standards. Describes their organization and how they should be applied.

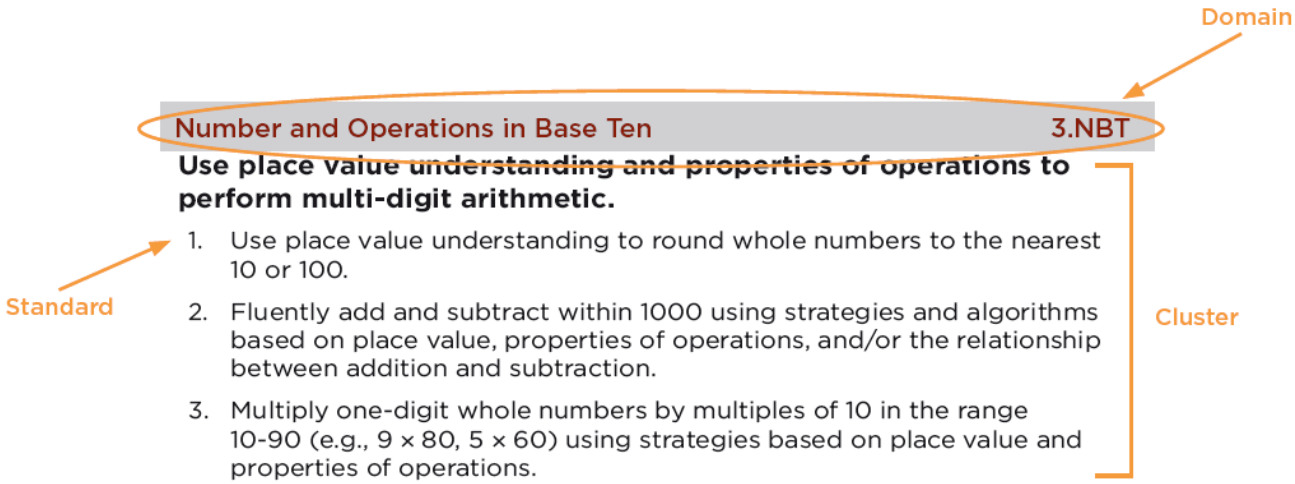
Standards for Mathematical Practice – These overarching standards apply across the content standards in each grade

- Standards for mathematical proficiency: reasoning, problem solving, modeling, decision making, and engagement
- Mathematical "habits of mind"

<u>Grade-Level Standards</u> – Define what students should know and be able to do at each grade level

K-8 grade-by-grade standards are organized by domain

- **Domains**: overarching ideas that connect topics across the grades
- **Clusters:** illustrate progression of increasing complexity from grade to grade



9-12 high school standards are organized around five conceptual categories

- Number and Quantity, Algebra, Functions, Geometry, and Statistics and Probability
- Content categories: overarching ideas that describe strands of content
- Domains/Clusters: groups of standards that describe coherent aspects of the content category

- Standards indicated as (+) are beyond the college and career readiness level but are necessary for advanced mathematics courses (calculus, discrete mathematics, and advanced statistics.)

Key Points in the Mathematics Standards

• The mathematics curriculum in the United States must become substantially more focused and coherent in order to improve mathematics achievement .... To deliver on the promise of common standards, the standards must address the problem of a curriculum that is 'a mile wide and an inch deep.' That is, what and how students are taught should reflect not only the topics that fall within a certain academic discipline, but also the **key ideas** that determine how knowledge is organized and generated within that discipline. This implies that 'to be coherent,' a set of content standards must evolve from particulars… to deeper structures inherent in the discipline.

• The standards stress not only procedural skill but also **conceptual understanding**, to make sure students are learning and absorbing the critical information they need to succeed at higher levels - rather than the current practices by which many students learn enough to get by on the next test, but forget it shortly thereafter, only to review again the following year.

• The K-5 standards provide students with a solid foundation in whole numbers, addition, subtraction, multiplication, division, fractions and decimals—which help young students build the foundation to successfully apply more demanding math concepts and procedures, and move into applications.

• Having built a strong foundation K-5, students can do *hands on* learning in geometry, algebra and probability and statistics. Students who have completed 7th grade and mastered the content and skills through the 7th grade will be well-prepared for algebra in grade 8.

• The high school standards call on students to practice applying mathematical ways of thinking to **real world issues and challenges**; they prepare students to think and reason mathematically. The high school standards set a rigorous definition of college and career readiness, by helping students develop a depth of understanding and ability to apply mathematics to novel situations, as college students and employees regularly do.

• The high school standards emphasize **mathematical modeling**, the use of mathematics and statistics to analyze empirical situations, understand them better, and improve decisions.

Mathematics Standards

Standards for Mathematical Practice

The Standards for Mathematical Practice describe ways in which developing student practitioners of the discipline of mathematics increasingly ought to engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle and high school years.

1. Make sense of problems and persevere in solving them.

2. Reason abstractly and quantitatively.

3. Construct viable arguments and critique the reasoning of others.

4. Model with mathematics.

5. Use appropriate tools strategically.

6. Attend to precision.

7. Look for and make use of structure.

8. Look for and express regularity in repeated reasoning.

The Standards for Mathematical Content are a balanced combination of procedure and understanding. Expectations that begin with the word "understand" are often especially good opportunities to connect the practices to the content. Students who lack understanding of a topic may rely on procedures too heavily. Without a flexible base from which to work, they may be less likely to consider analogous problems, represent problems coherently, justify conclusions, apply the mathematics to practical situations, use technology mindfully to work with the mathematics, explain the mathematics accurately to other students, step back for an overview, or deviate from a known procedure to find a shortcut. In short, a lack of understanding effectively prevents a student from engaging in the mathematical practices. In this respect, those content standards which set an expectation of understanding are potential "**points of intersection**" between the Standards for Mathematical Content and the Standards for Mathematical Practice. These points of intersection are intended to be weighted toward central and generative concepts in the school mathematics curriculum...

Pedagogical Shifts Demanded by the Mathematics Standards

			Notes & Ideas
1	**Focus**	Teachers significantly narrow and deepen the scope of how time and energy is spent in the math classroom. They do so in order to focus deeply on only the concepts that are prioritized in standards.	
2	**Coherence**	Educators carefully connect the learning within and across grades so that students can build new understanding onto foundations built in previous years.	
3	**Fluency**	Students are expected to have speed and accuracy with simple calculations; teachers structure class time and/or homework time for students to memorize, through repetition, core functions.	
4	**Deep Understanding**	Students deeply understand and can operate easily within a math concept before moving on. They learn more than the trick to get the answer right. They learn the math.	
5	**Application**	Students are expected to use math and choose the appropriate concept for application even when they are not prompted to do so.	
6	**Dual Intensity**	Students are practicing and understanding. There is more than a balance between these two things in the classroom – both are occurring with intensity.	

Source: ENGAGE NY

Key Conceptual Understandings and Processes in the Science Standards

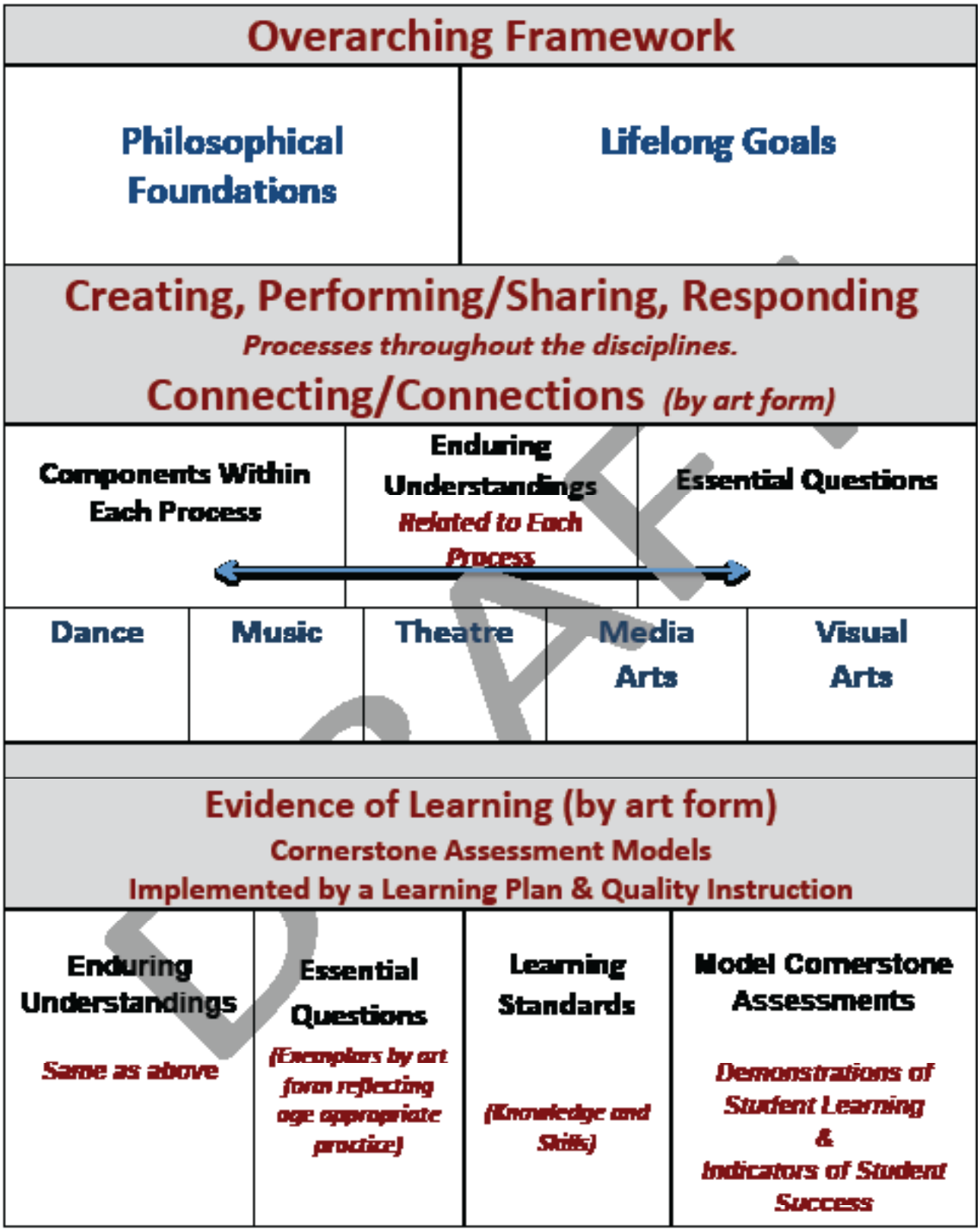
Crosscutting Scientific and Engineering Concepts

1. Patterns – Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them.
2. Cause and Effect – Mechanism and explanation. Events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and explaining causal relationships and the mechanisms by which they are mediated. Such mechanisms can then be tested across given contexts and used to predict and explain events in new contexts.
3. Scale, Proportion, and Quantity – In considering phenomena, it is critical to recognize what is relevant at different measures of size, time, and energy and to recognize how changes in scale, proportion, or quantity affect a system's structure or performance.
4. Systems and System Models – Defining the system under study – specifying its boundaries and making explicit a model of that system – provides tools for understanding and testing ideas that are applicable throughout science and engineering.
5. Energy and Matter – Flows, cycles, and conservation. Tracking fluxes of energy and matter into, out of, and within systems helps one understand the systems' possibilities and limitations.
6. Structure and Function – The way in which an object or living thing is shaped and its substructure determine many of its properties and functions.
7. Stability and Change – For natural and built systems alike, conditions of stability and determinants of rates of change or evolution of the system are critical elements of study.

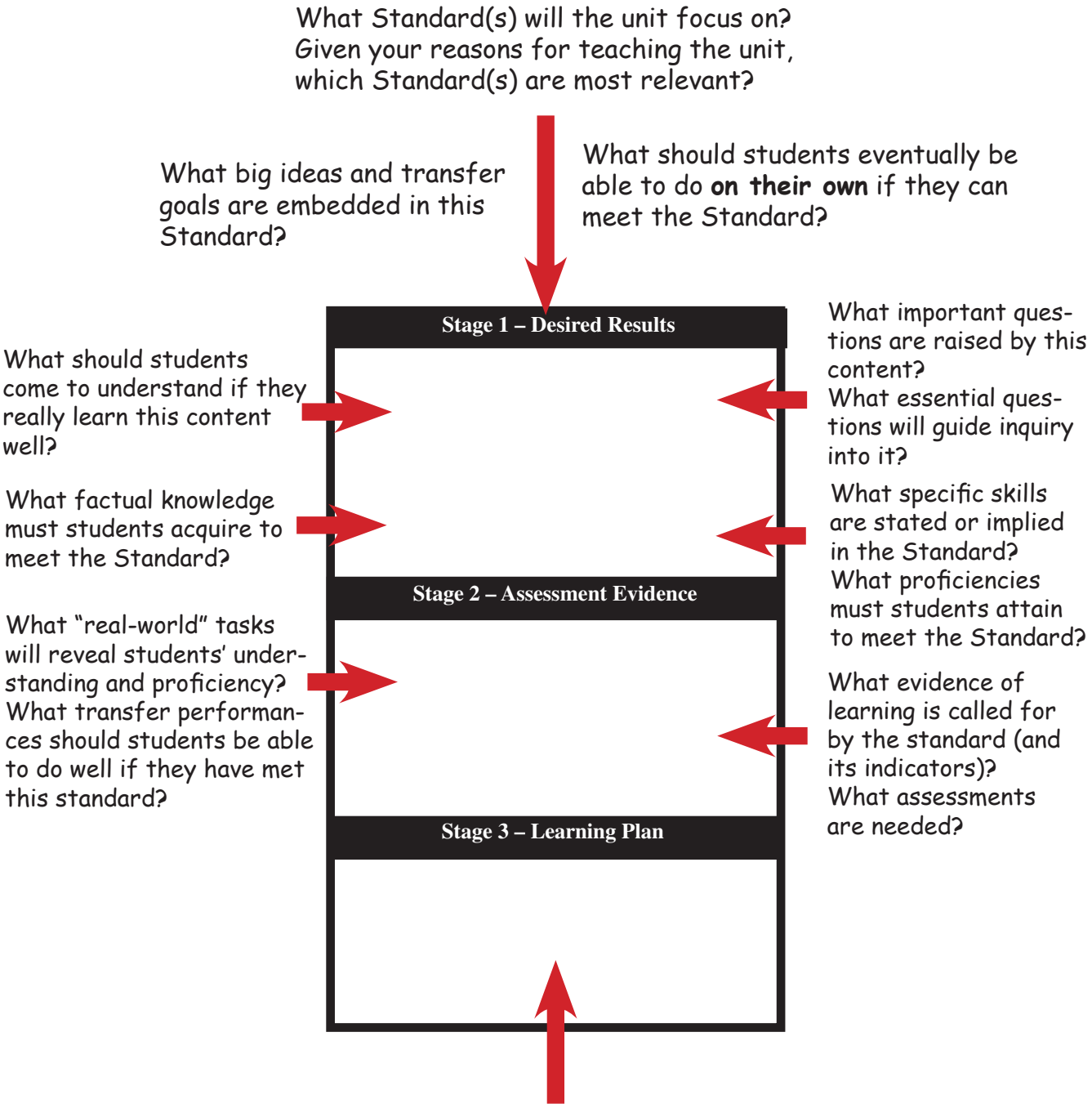
Practices for K-12 Science Classrooms

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics, information and computer technology, & computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Next Generation Arts Standards



Curriculum Planning with Standards using UbD



TRANSFER GOALS

Definition

Transfer Goals highlight the effective uses of understanding, knowledge, and skill that we seek in the long run; i.e., what we want students to be able to do when they confront new challenges – both in and outside of school. There are a small number of overarching, long-term transfer goals in each subject area. For example, a long-term aim in mathematics is for students to be able to solve "real world" problems on their own. A long-term transfer goal in history is for students to apply the lessons of history when considering contemporary issues.

In every case, the ability to transfer learning manifests itself in not just one setting but varied real-world situations. Transfer is about independent performance in context. You can only be said to have fully understood if you can apply your learning without someone telling you what to do and when to do it. In the real world, no teacher is there to direct and remind you about which lesson to plug in here or there. Transfer is about intelligently and effectively drawing from your repertoire, independently, to handle new contexts on your own. In the real world, no teacher is there to direct and remind you about which lesson to plug in here or there: transfer is about intelligently and effectively drawing from your repertoire, independently, to handle particular contexts on your own. The goal of transfer thus requires that an instructional plan (in Stage 3) help the student to become increasingly autonomous, and the assessments (in Stage 2) need to determine the degree of student autonomy.

Transfer goals have several distinguishing characteristics:

- They require application (not simply recognition or recall).
- The application occurs in new situations (not ones previously taught or encoun tered; i.e., the task cannot be accomplished as a result of rote learning).
- The transfer requires a thoughtful assessment of which prior learning applies here – i.e. some strategic thinking is required (not simply "plugging in" skill and facts).
- The learners must apply their learning autonomously (on their own, without coaching or teacher support).
- Transfer calls for the use of habits of mind (i.e., good judgment, self regulation, persistence) along with academic understanding, knowledge and skill.

Long Term Transfer Goals

examples

Students will be able to independently use their learning to:

Reading
• Read and respond to text in various genres (literature, non-fiction, technical) for various purposes (entertainment, to be informed, to perform a task).
• Comprehend text by getting the main idea (the "gist"), interpreting ("between the lines"), critically appraising, and making personal connections.

Writing
Effectively write in various genre for various audiences in order to Explain (narrative, expository), Entertain (creative), Persuade (persuasive), Help perform a task (technical), and Challenge or Change Things (satirical).

Mathematics
• Recognize and solve never-seen-before, "messy" mathematical problems in which the appropriate solution approach is not obvious.

Science
• Evaluate scientific claims (e.g., XX brand of paper towels absorbs the most liquid of all the leading brand), and analyze current issues involving science or technology. (e.g., Ethanol is the most cost-effective alternative fuel source.)
• Conduct an investigation to answer a question

History
• Apply lessons of the past (patterns of history) to current and future events and issues, and to other historical events.
• Critically appraise historical and contemporary claims/decisions.

Performing Arts
• Interpret the meaning of works of art.
• Create and perform an original work in a selected medium to express ideas and/or to evoke mood and emotion.

Health and Physical Education
• Make healthful choices and decisions regarding diet, exercise, stress management, alcohol/drug use.

World Language
• Communicate effectively in the target language in "real world" situations.
• Demonstrate a sensitivity to culture and context.

UNDERSTANDINGS

Definition

Identify the important, transferrable ideas and processes that students should come to understand. Understandings differ in scope and breadth. **Overarching** understandings point beyond the specifics of a unit to the larger, transferrable ideas that spiral throughout the curriculum. **Topical** understandings target the particular insights we want students to attain within a unit of study. Topical understandings are less likely to transfer to other topics. Effective understandings…

- Reflect important, transferrable ideas
- Are stated as full-sentence generalizations — Students will understand that…

Desired understandings are identified in Stage 1 for the purpose of:

1. focusing curriculum around enduring, transferable learning to avoid educator and student fixation on narrow objectives;
2. encouraging active meaning making by students; and
3. are necessary for transfer of learning to new situations.

Examples

Overarching Understandings	Topical Understandings
Economics Price is a function of supply and demand. Science Gravity is not a physical thing but a term describing the constant rate of acceleration of all falling objects. Physical Education A muscle that contracts through its full range of motion will generate more force Mathematics Mathematics allows us to see patterns that might have remained unseen.	Unit on Money (elementary) The cost of a Beanie Baby depends on demand and availability at any given time. Unit on Gravitational Force Vertical height, not the angle and distance of descent, determines the eventual speed of a falling object. Unit on Golf A full stroke with follow-through will increase your distance on a drive. Unit on Statistics Statistical analysis and graphic displays often reveal patterns in seemingly random data or populations, enabling predictions.

Understandings

examples

Students will understand that....

Arithmetic (numeration)
- Numbers are concepts that enable people to represent quantities, sequences, and rates.
- Different number systems can represent the same quantities (e.g., bases).

Art
- The greatest artists often break with established traditions and techniques to better express what they see and feel.
- Available tools, techniques and resources influence artistic expression.
- Great art addresses universal themes of human existence.

Dance
- Dance is a language of shape, space, timing and energy.
- Movement can communicate ideas and feelings.

Economics
- In a free-market economy, price is a function of supply and demand.
- Relative scarcity may lead to trade and economic interdependence or to conflict.

Foreign/World Language
- Studying other languages and cultures offers insights into our own.
- Meaning is conveyed through phrasing, intonation, and syntax. (Just because you can translate all the words doesn't mean you understand the speaker.)

Geography
- The topography, climate, and natural resources of a region influence the culture, economy, and life-style of its inhabitants.
- All maps distort the earth's representation of area, shape, distance, and/or direction.

Government
- Democratic governments must balance the rights of individuals with the common good.
- A written constitution sets forth the terms and limits of a government's power.
- Different political systems vary in their tolerance and encouragement of innovation.

History
- History involves interpretation; historians can and do disagree.
- Historical interpretation is influenced by one's perspective (e.g., freedom fighters vs. terrorists).

Media/Technology
- Technological progress presents new possibilities and problems.
- Just because it is on the Internet or in a book, doesn't make it true.

Understandings

examples

Literature

• Novelists often provide insights about human experience through fictional means.
• An effective story engages the reader by setting up questions – tensions, mystery, dilemmas, or uncertainty - about what will happen next.
• Everybody is entitled to an opinion about what a text means, but some interpretations are more s upportable by the text than others.

Mathematics

• Sometimes the "correct" mathematical answer is not the best solution to "real-world" problems.
• Heuristics are strategies that can aid problem solving (e.g., breaking a complex problem into chunks, creating a visual representation, working backward from the desired result, guess and check).
• Statistical analysis and data display often reveal patterns that may not be obvious.

Music

• The silence is as important as the notes.
• Popular music has shifted from emphasizing melody and lyrics to emphasizing multi-layered rhythms.

Physical Education/Athletics

• Creating "space" away from the ball/puck spreads the defense and increases scoring opportunities (e.g., in basketball, soccer, football, hockey, water polo, and lacrosse).
• The most efficient and effective swimming strokes involve pulling and pushing the water directly backward.
• Proper follow through increases accuracy when throwing (e.g., baseball, foul shot) and swinging (e.g., golf, tennis).

Reading/Language Arts

• Effective readers use specific strategies to help them better understand the text (e.g., using context clues, questioning the author, predicting what will come next, re-reading, summarizing, etc.
• Different types of texts (e.g., narrative, mystery, biography, expository, persuasive, etc.) have different structures. Understanding a text's structure helps a reader better understand its meaning.

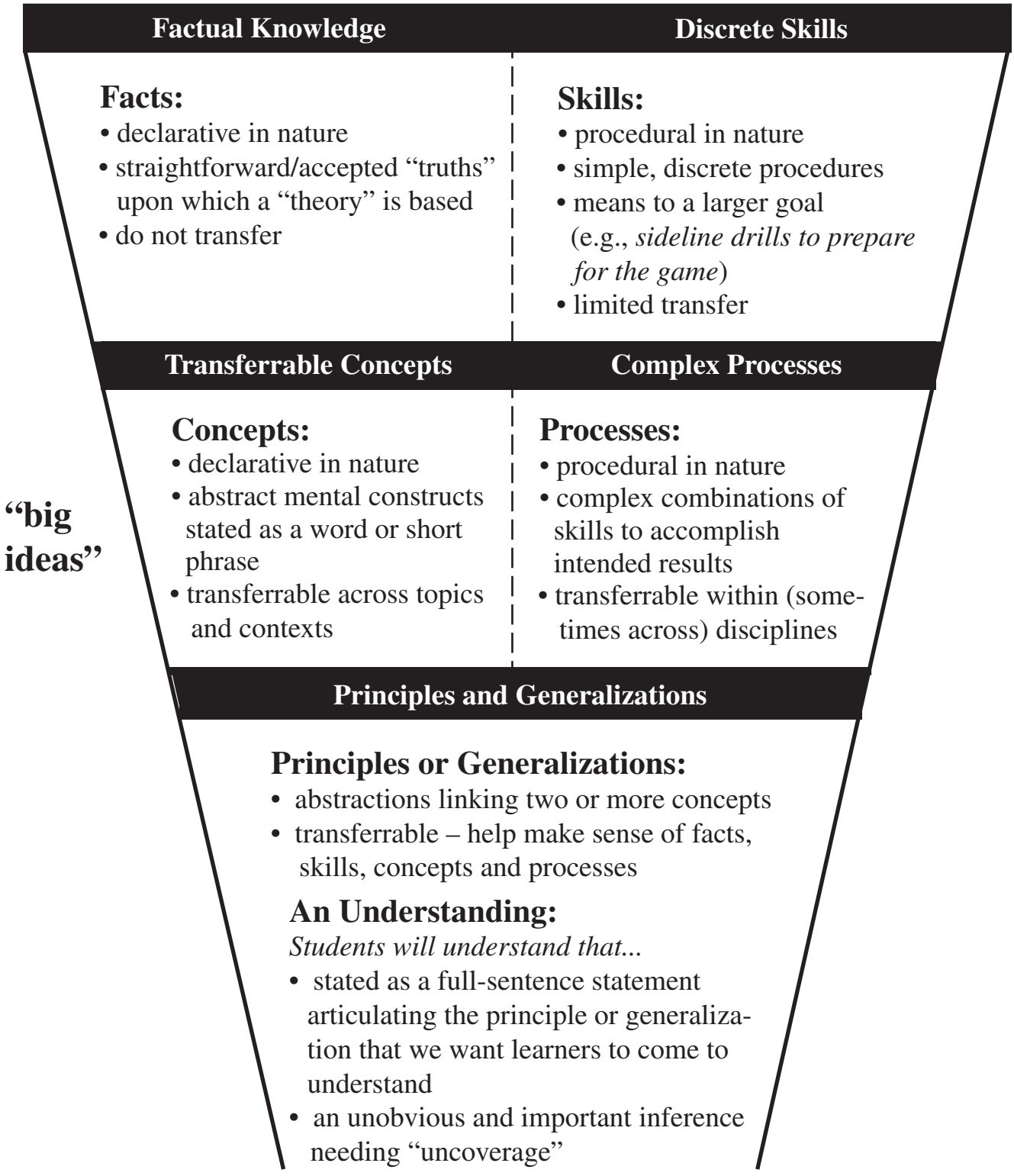
Science

• Scientific claims must be verified by independent investigations.
• Standardized measures allow people to more accurately describe the physical world.
• Correlation does not insure causality.

Writing

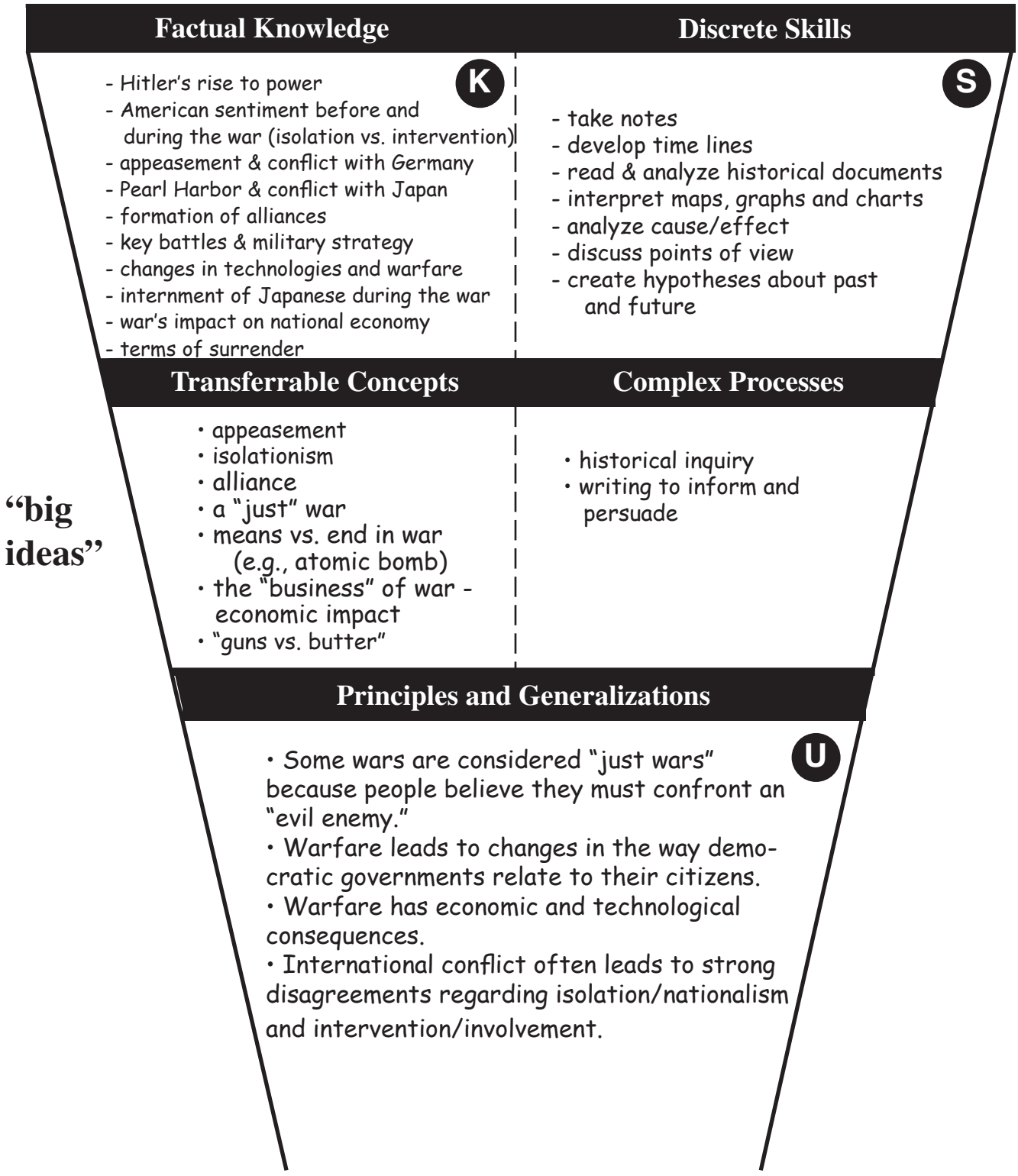
• Audience and purpose (e.g., to inform, persuade, entertain) influence the use of literary techniques (e.g., style, tone, word choice).
• Punctuation marks and grammar rules are like highway signs and traffic signals – they guide readers through the text to help avoid confusion.

Structure of Knowledge – Definitions of the Elements



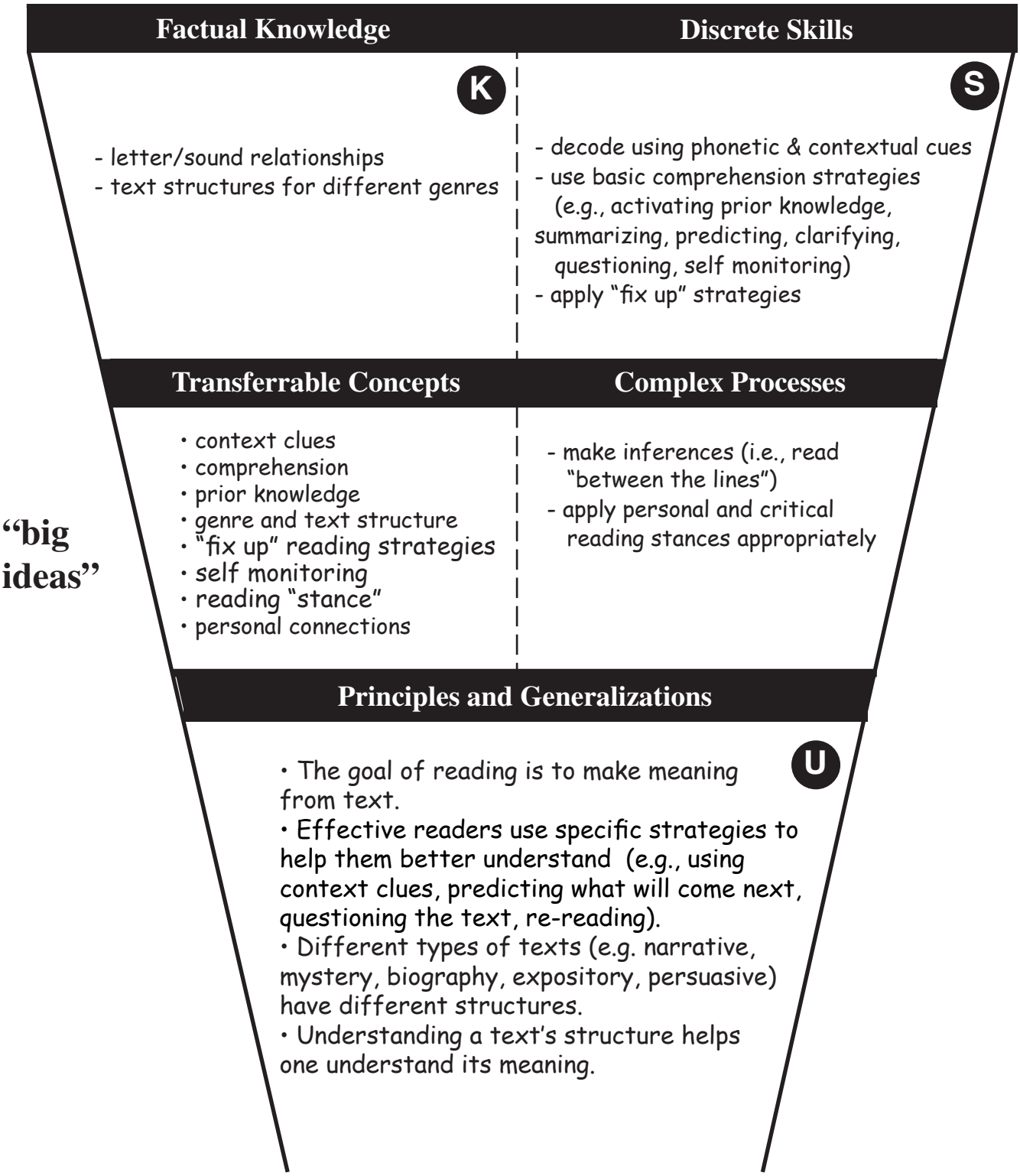
Structure of Knowledge

Established Goal/Topic: *World War II*



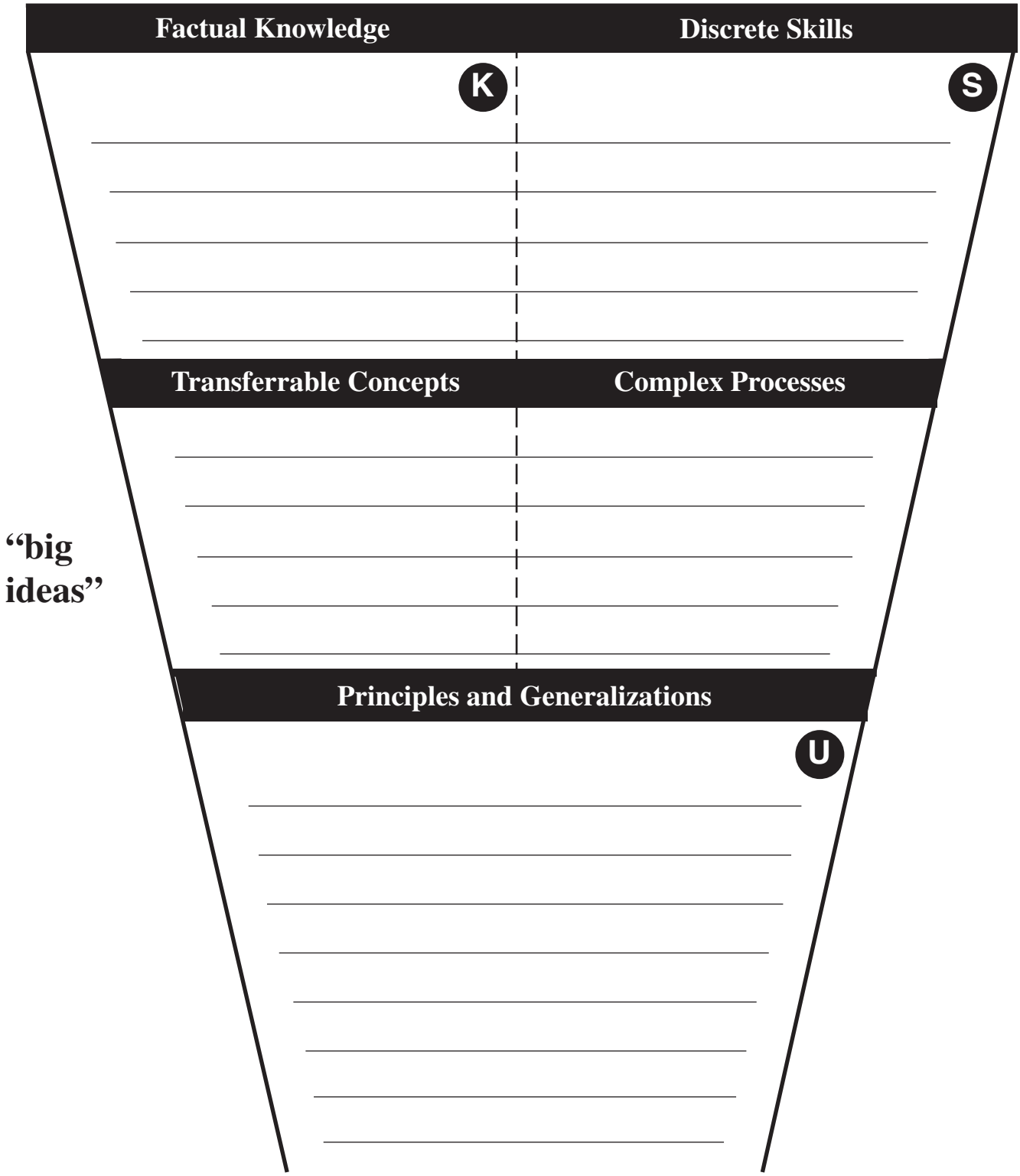
Structure of Knowledge

Established Goal/Topic: *reading*



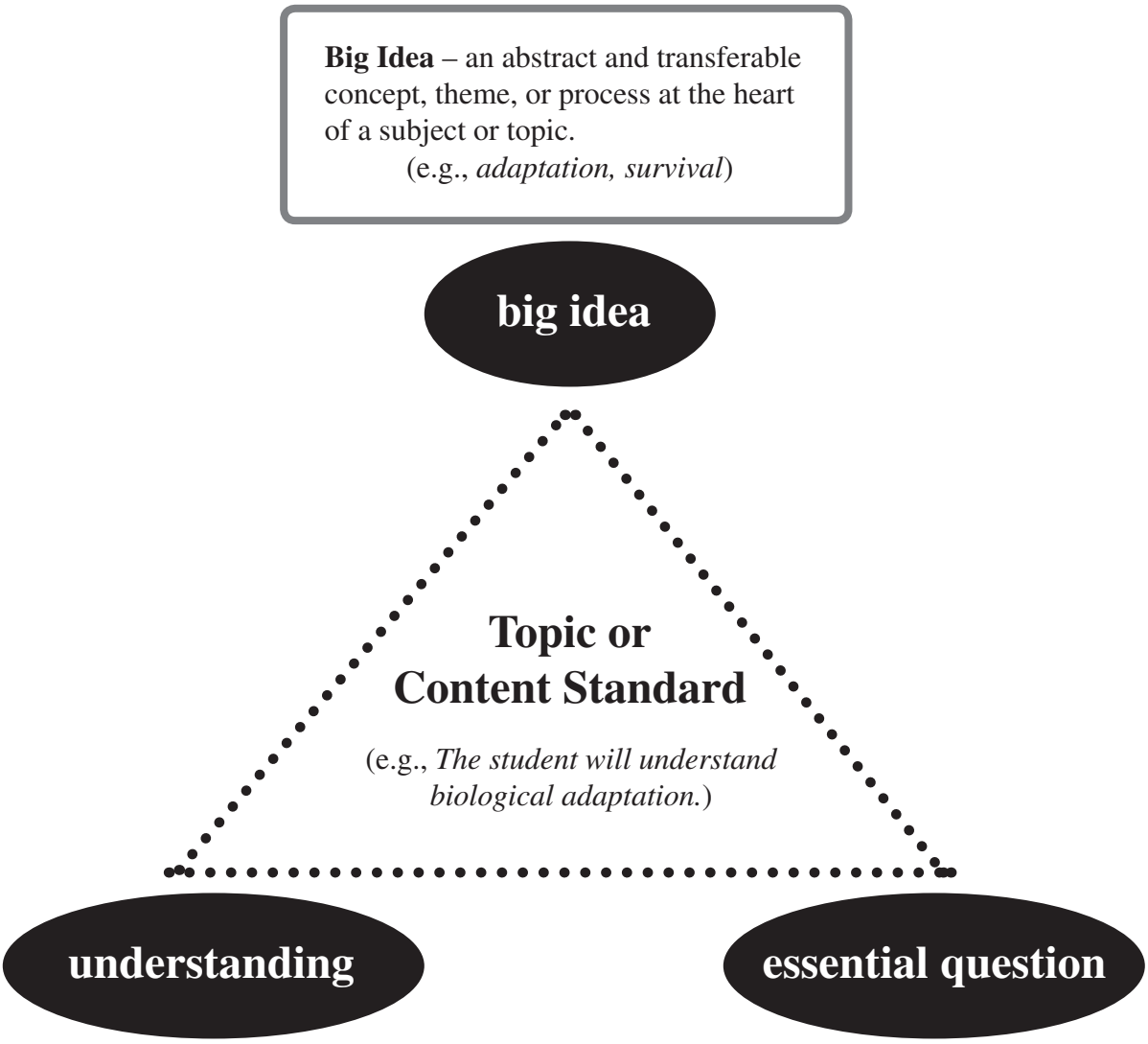
Structure of Knowledge

Established Goal/Topic:



Big Ideas, Understandings and Essential Questions

The following visual represents the interrelationship among big ideas, understandings and essential questions.



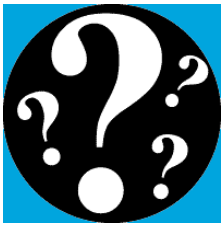
U

Understanding – a full-sentence generalization, specifying what we want students to come to understand about the big idea(s).
(e.g., *Students will understand that... Living organisms (populations) adapt in order to survive harsh or changing environments.*)

Q

Essential Question – a provocative, open-ended question, designed to guide inquiry into the big idea(s). By actively exploring the essential question(s), students make meaning and deepen their understanding.
(e.g., *How do living organisms survive in harsh or changing environments?*)

ESSENTIAL QUESTIONS



Definition

Open-ended questions designed to promote sustained inquiry and meaning making. Essential questions differ in scope and breadth. We distinguish between overarching and topical questions. **Overarching** essential questions point beyond the particulars of a unit to the larger, transferable ideas and enduring understandings. They recur fruitfully across the grades, spiraling throughout the curriculum to provide conceptual through lines. Effective overarching essential questions:

- are broad and general in nature; and
- lead to overarching understandings

Topical essential questions are more specific. They guide the exploration of ideas and processes within particular topics within a unit of study.

Essential questions are identified in Stage 1 for the purpose of:

1. Provoking deep thought, lively discussion, sustained inquiry, and additional questions leading to new and/or deeper insight(s)
2. Asking students to consider alternatives, weigh evidence, support their ideas and rethink key ideas
3. Support connections within and across content and context

Examples

Overarching Essential Questions	Topical Essential Questions
• *In what ways does art reflect culture as well as shape it?* • *How do artists choose tools, techniques, and materials to express their ideas?* • *What makes a great story?* • *How do effective writers hook and hold their readers?*	**unit on masks** • *What do masks and their use reveal about the culture? What tools, techniques, and materials are used in creating masks from different cultures?* **unit on mysteries** • *What is unique about the mystery genre?* • *How do great mystery writers hook and hold their readers?*

Unpacking Standards - "Inside Out" Method

STANDARD

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

Source: Common Core – College and Career Readiness Standards – Writing

Stated/implied "big ideas" in NOUNS:

- arguments
- claims
- topics or texts
- evidence
- reasoning

Stated/implied performances in VERBS:

- write
- support (claims)
- analyze (topics/texts)
- reasoning

ADJECTIVES and ADVERBS:

- valid
- relevant
- sufficient

Understandings

- The effectiveness of an argument is dependent upon the quality of the supporting evidence used (validity, appropriateness) and how it is conveyed.

Essential Questions

- *What makes an argument convincing?*
- *What is the best evidence I can use to support my argument?*
- *How do I best organize and present my argument?*

Transfer Goal(s)

produce clear and coherent writing to persuade a target audience

Performance Task(s)

Based on your reading of informational texts on a local or national issue, prepare a (report, letter to editor, essay) for a specific audience to convince them of your position. Your argument should follow a logical sequence with supporting evidence for your position (claim).

Criteria

- relevant evidence
- sufficient evidence
- valid reasoning

Unpacking Standards - "Inside Out" Method

STANDARD

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Source: Common Core – College and Career Readiness Anchor Standards – Writing

Stated/implied "big ideas" in NOUNS:

- development • organization • style
- task • audience • purpose

("form follows function")

Stated/implied performances in VERBS:

Produce (writing)

ADJECTIVES and ADVERBS:

- clear
- coherent
- appropriate

Understandings

- A writer's purpose (e.g., to inform, entertain, persuade, etc.) and audience shapes the style, development and organization of the writing.
- Different writing genres and purposes have unique organizational patterns.

Essential Questions

- *What is my goal? For whom am I writing?*
- *How does purpose and audience affect a writer's style and organization?*
- *How do effective writers hook and hold their readers in different genres (e.g., mystery, essay, poem, historical fiction)?*

Transfer Goal(s)

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Performance Task(s)

- Write for the same purpose to different audiences, and explain the influence of the target audience on thestyle, word choice, etc.
- Write on the same content in two different genres and explain each genre's influence on organization, style, word choice.

Criteria

- clear • coherent
- appropriate to task, purpose, audience

Unpacking Standards - "Inside Out" Method

STANDARD

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

Source: Common Core – College and Career Readiness Anchor Standards – Reading

Stated/implied "big ideas" in NOUNS:

- ideas
- themes
- text
- development
- details

Stated/implied performances in VERBS:

- determine
- analyze
- summarize

ADJECTIVES and ADVERBS:

- central
- key
- supporting

Understandings

- Authors do not always state the central idea or theme overtly; readers have to infer it "between the lines."
- Effective readers use specific strategies to help them infer the implied main ideas of a text.

Essential Questions

- How can I to determine the central idea or theme of what I read?
- How can I read "between the lines" to determine the author's meaning?
- What strategies do effective readers use to make meaning from a text?

Transfer Goal(s)

Determine central ideas or themes of a text and analyze their development. Summarize the key supporting details

Performance Task(s)

- Prepare a "study guide" for students by summarizing the central ideas or key themes of a text.
- Use the "Adding up the Facts" organizer to show how supporting details lead to an inference about main ideas.

Criteria

- appropriate inference
- effective summary
- supported by key details

Unpacking Standards - "Inside Out" Method

STANDARD Model with Mathematics

Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace....routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

Source: Common Core State Standards – Mathematics

Stated/implied "big ideas" in NOUNS:

- mathematical model(s)
- "real life" problems
- disciplines and life

Stated/implied performances in VERBS:

- model
- apply
- solve
- interpret
- reflect on
- improve

ADJECTIVES and ADVERBS:

Understandings

- Mathematical models simplify and connect phenomena to assist in understanding and problem solving.
- Mathematical models must be viewed critically so that they do not mislead.
- Effective problem solvers always check for the reasonableness of solutions.

Essential Questions

- *How can I best model this phenomena in this situation?*
- *Do these results make sense?*
- *What are the limits of this mathematical model in this context?*
- *What do effective problem solvers do?*

Transfer Goal(s)

Apply the mathematics they know to develop mathematical models for solving real world problems

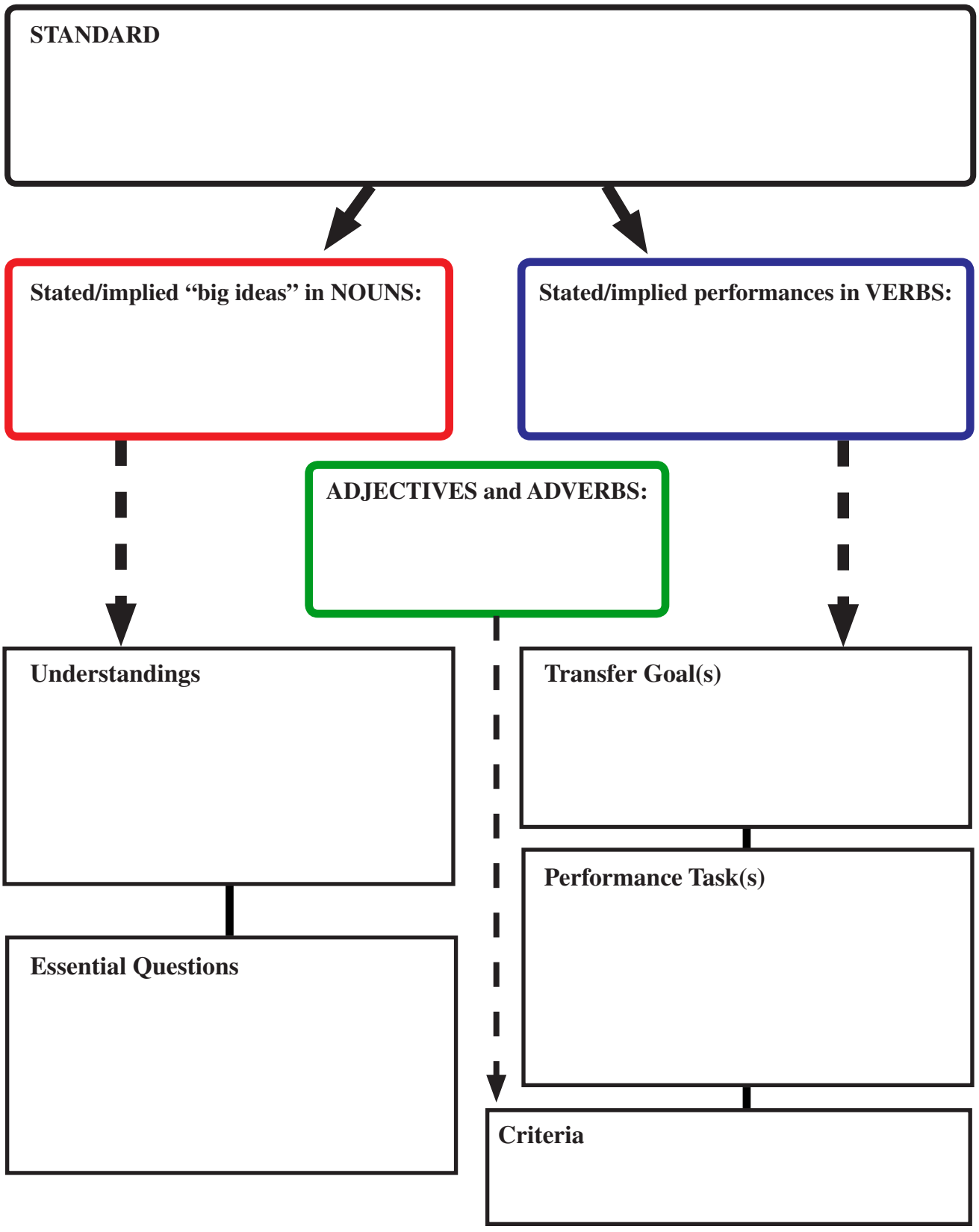
Performance Task(s)

- Create a mathematical model for a selected "real-world" situation (e.g., seasonal temperatures).
- Critically review and improve a mathematical model for its appropriateness to a given situation.

Criteria

- appropriate modeling
- accurate
- reasonableness of solution

Unpacking Standards - "Inside Out" Method



Sources of Assessment Evidence: Self Assessment

Directions: Use the following scale to rate your "level of use" of each of the following assessment tools (at the classroom, school or district level). What do the survey results suggest? What patterns do you notice? Are you collecting appropriate evidence for *all* the desired results, or only those that are easiest to test and grade? Is an important learning goal "falling through the cracks" because it is not being assessed?

4 = Frequent Use

3 = Use Sometimes

2 = Occasional Use

1 = Do Not Use

_____1. selected-response format (e.g., multiple-choice, true-false) quizzes and tests

_____2. written/oral responses to academic prompts (short-answer format)

_____3. performance assessment tasks, yielding:

____ extended written products (e.g., essays, lab reports)

____ visual products (e.g., Power Point show, mural)

____ oral performances (e.g., oral report, foreign language dialogues)

____ demonstrations (e.g., skill performance in physical education)

_____4. long-term, "authentic" projects (e.g., senior exhibition)

_____5. portfolios - collections of student work over time

_____6. reflective journals or learning logs

_____7. informal, on-going observations of students

_____8. formal observations of students using observable indicators or criterion list

_____9. student self-assessments

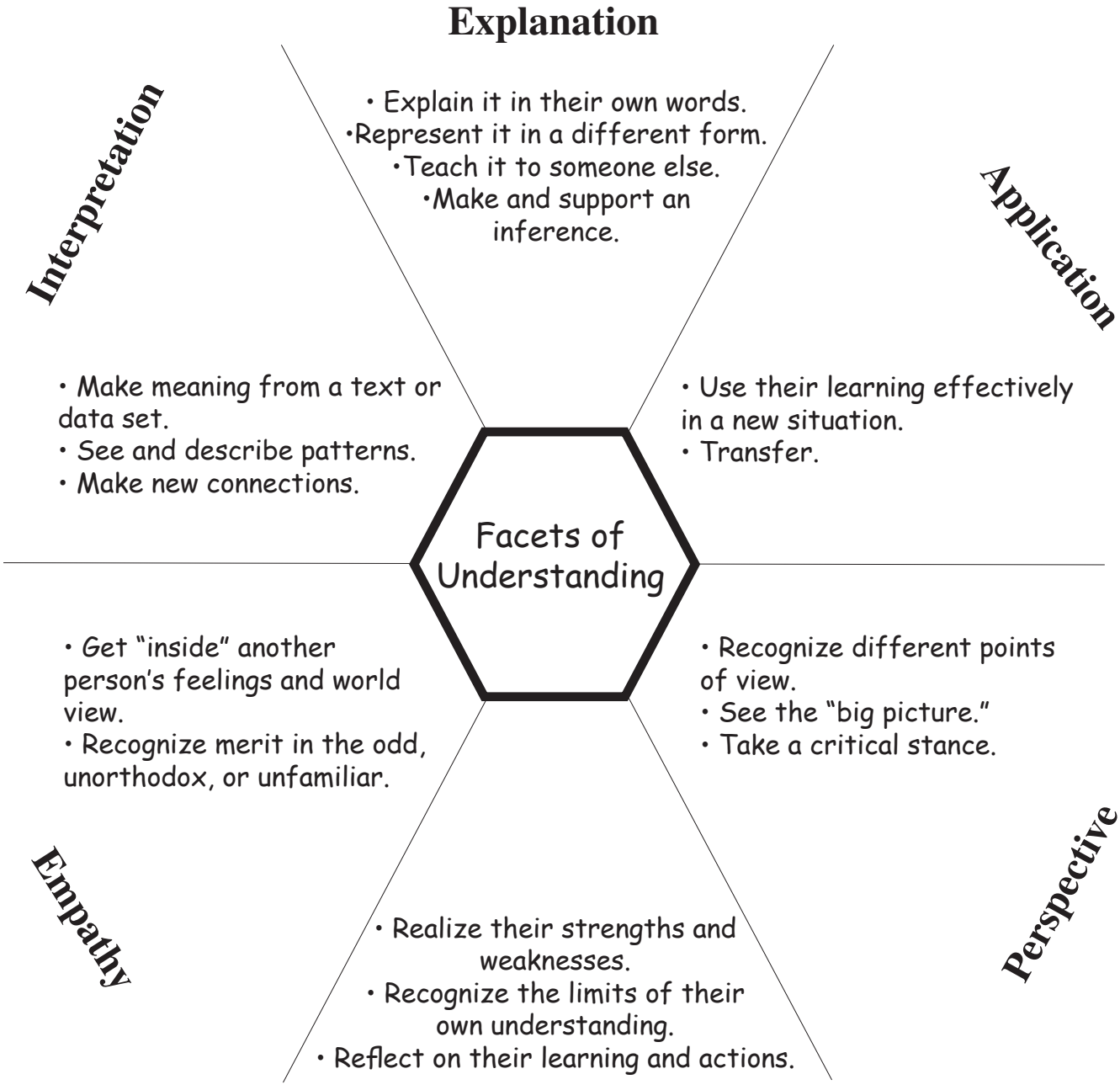
_____10. peer reviews and peer response groups

_____11. other: _____

The Facets of Understanding

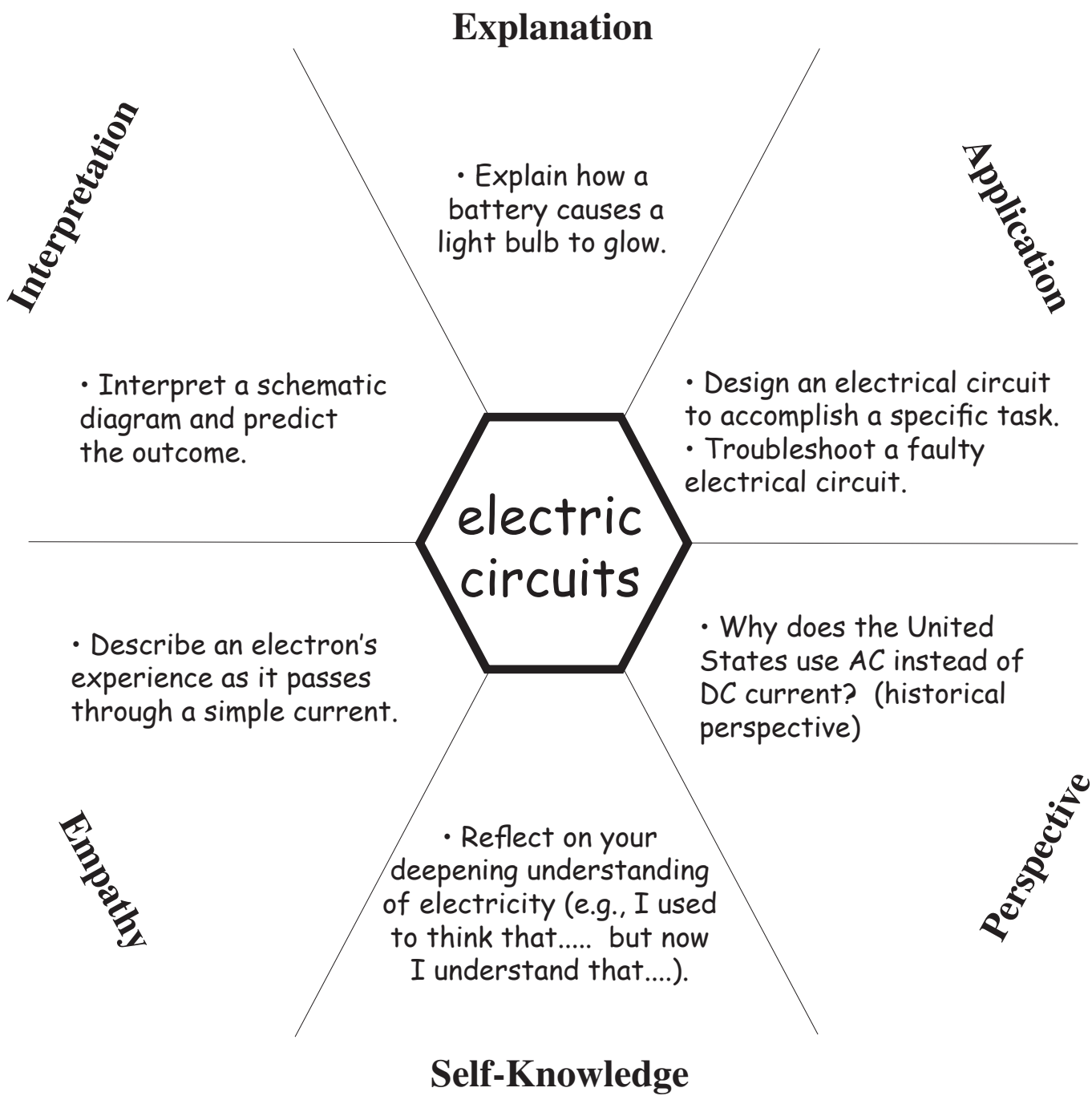
The facets of understanding provide *indicators* of understanding and thus can be used to select or develop assessments.

If someone really understands something, they can...



Brainstorming Assessment Ideas Using the Facets

Use the six facets of understanding to generate possible ways in which students might reveal understanding.



Performance Tasks

Performance tasks can be used as rich learning activities or as assessments. They ask students to apply knowledge and skills to a new situation, and typically yield tangible products and performances that serve as evidence of learning. Performance tasks (as distinct from long-term projects) can usually be completed within a relatively short time frame, generally between one and four class periods. Here are general characteristics of performance tasks; they:

- demand thoughtful application of knowledge and skills, not just recall;
- yield tangible products and performances that serve as evidence of learning;
- establish authentic contexts for performance;
- can integrate two or more subjects as well as 21st century skills (e.g., critical thinking, technology use, teamwork);
- do not have a "single, best" answer or one, "right way" to accomplish the task;
- evaluate performance with established criteria and rubrics; and
- may be used as rich learning activities and/or assessments.

Performance tasks may be content-specific (e.g., mathematics, science, social studies) or integrated (i.e., involving two or more subjects). One natural interdisciplinary connection is to include a reading, research and/or communication (writing, graphics, presentation) component to tasks in content areas. Such tasks encourage students to see meaningful learning as integrated, rather than something which occurs in isolated segments.

Two examples of performance tasks are provided below.

Fairy Tales [grades 3-4]

You have just finished reading three fairy tales that all have the same general pattern – characters overcoming a confrontation with an animal when the animal's intent is to harm the character(s). Your task is to write a story that includes all the characteristics of a fairy tale and also uses this same general pattern. You will then read your story to your kindergarten reading buddy and teach him/her about the characteristics and general pattern of a fairy tale.

Source: Assessing Outcomes: Performance Assessment Using Dimensions of Learning

City Park [high school physics]

Your design team has been asked by the City Park Department to construct a model for a new playground near the elementary school. The playground will have swing sets and see-saws. For the safety of the children who will be using the playground equipment, you must design your swings so that they don't swing too fast or "loop-the-loop " over the top of the swing set.

Design and conduct an experiment to determine how the variables - length, mass, height of release - affect the rate of back-and-forth movement of a swing. Be prepared to present your findings, recommendations, and a demonstration to the City Park officials.

Source: A Tool Kit for Professional Developers: Alternative Assessment

Performance Task Examples

Examine the performance task vignettes on the following pages. What distinguishes these tasks from typical test "items"? What common features or characteristics do these share?

Painting a Schoolroom – *(Mathematics, grades 7-9)*

When contractors give us an estimate on repairs, how can we know if the cost is reasonable? You have been asked by the Principal to review a painting contractor's proposal to determine whether s/he is being overcharged. (Students are given room dimensions and cost figures for materials, labor, and a 20% profit.)

Examine the proposal and write a letter to the Principal providing your evaluation of the proposal. Be sure to show your calculations so that s/he will understand how you arrived at your conclusion.

Mail-Order Friend – *(Language Arts, grades K-2)*

Imagine that you have an opportunity to "order" a friend by telephone from a mail-order catalog. Think about the qualities that you want in a friend. Before you "order" your friend over the telephone, practice asking for three characteristics that you want in a friend and give an example of each characteristic. Remember to speak clearly and loud enough so that the sales person will know exactly what to send.

From the Mountains to the Seashore – *(History, Geography, Math, grades 5-8)*

A group of nine foreign students is visiting your school for one month as part of an international exchange program. (Don't worry, they speak English!) The principal has asked your class to plan and budget a four-day tour of Massachusetts to help the visitors understand the state's impact on the history and development of our nation. Plan your tour so that the visitors are shown sites that best capture the ways that MA has influenced our nation's development.

You should prepare a written tour itinerary, including an explanation of why each site was selected. Include a map tracing the route for the four-day tour and a budget for the trip.

Spot Remover – *(Science, middle school)*

Chris wants to decide which of two spot removers is best. First, he tried Spot Remover A on a T-shirt that had fruit stains and chocolate stains. Next, he he tried Spot Remover B on jeans that had grass stains and rust stains. Then he compared the results.

Explain what did Chris do wrong that will make it hard for him to know which spot remover is best. Redesign the experiment to help him determine the best spot remover.

Performance Task Examples

Hall of Recognition – *(Social Studies, Language Arts, grade 4-5)*

The state has announced the establishment of a Hall of Recognition to honor the contributions of local citizens to their community, the state or the nation. Since you are learning about famous individuals from _____, you have been asked to nominate a candidate who you believe would be worthy of admission to the Hall.

Your task is to select and research the life of your chosen individual. Submit a nomination letter to the Hall's selection committee explaining the reasons why your candidate should be included Hall of Recognition. Be sure to describe his/her accomplishments and the contributions they he/she has made.

We Salute You - *(Language Arts, Social Studies, grades 1-4)*

Our room mother, Mrs. _____, has done many things to help us throughout the year. When people do things for you, it is important to show appreciation. We will each be writing a letter to her to thank her and let her know how she has helped our class.

Your letter should include all the parts of a friendly letter. Be sure to tell Mrs. _____ at least three ways she has been helpful to our class. Include at least one thing that you especially appreciate about Mrs. _____.

Chemical Equilibrium – *(Chemistry, grades 11 - 12)*

You are a researcher hired by a group of expert mountain climbers. Hypoxia is the set of symptoms (headache, fatigue, nausea) that comes from a lack of oxygen in body tissues. It is often felt by mountain climbers as they ascend altitude quickly. Sherpas, longtime residents of high altitudes, seem to feel no hypoxic discomfort. Why might that be? Your group wants to know, and to benefit from the knowledge.

Design a series of experiments that would test the difference in hypoxic symptoms between mountain climbers and sherpas. Explain, using chemical equilibrium, why high altitude causes hypoxia in the climbers. How can sherpas avoid these symptoms? How can you test for these possibilities? What would a positive test look like? What inherent errors would you have to be aware of?

Tour Director – *(World Languages - Level 1)*

You serve on a Welcome Committee to provide tours for new students. Plan a trip to three places (e.g., school, town, mall) in the new student's target language. Incorporate the following vocabulary: directions (left, right, near, far, next to, etc.), places (e.g., classrooms, cafeteria, gym, library, labs, churches, police and fire stations, schools, restaurants, stores) and transportation (e.g., bus, bike, stairs, escalators, taxi, train, car).

Remember to include a variety of locations, directions, and forms of transportation on your "trips." Keep sentences simple and narrate in the target language.

Unpacking Standards – "Matrix" Method

Common Core State Standards
Mathematics

Content Standards

Grade 6:

☑ Understand ratio concepts and use ratio reasoning to solve problems.

☑ Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

❑ Compute fluently with multi-digit numbers and find common factors and multiples.

❑ Apply and extend previous understandings of numbers to the system of rational numbers.

❑ Apply and extend previous understandings of arithmetic to algebraic expressions.

❑ Reason about and solve one-variable equations and inequalities.

❑ Represent and analyze quantitative relationships between dependent and independent variables.

☑ Solve real-world and mathematical problems involving area, surface area, and volume.

❑ Develop understanding of statistical variability.

❑ Summarize and describe distributions.

Process Standards

Standards for Mathematical Practice:

☑ 1. Make sense of problems and persevere in solving them.
❑ 2. Reason abstractly and quantitatively.
❑ 3. Construct viable arguments and critique the reasoning of others.
☑ 4. Model with mathematics.
❑ 5. Use appropriate tools strategically.
☑ 6. Attend to precision.
❑ 7. Look for and make use of structure.
❑ 8. Look for and express regularity in repeated reasoning.

TRANSFER GOAL(S) *Students will be able to independently use their learning to...*

apply mathematical reasoning to solve problems involving ratio.

PERFORMANCE TASK Ideas

A former NBA legend, Hoops McGinty, has pledged money to the local science museum for an exhibit on our solar system. He pledges the money under one condition: that a regulation NBA basketball be used to represent some aspect of the scale display and that other NBA-related shapes and sizes be used (e.g., a basketball be used to represent a planet or mon). The building floor space is 300 by 800 feet. As designer, how do you propose that the main exhibit hall with a model of the solar system be built to scale? Prepare a diagram with accurate measurements drawn to scale. Show your work so that Hoops will approve and select your design.

Unpacking Standards – "Matrix" Method

A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas Science

High School Biology

Content Standards

Core Concepts of Science and Engineering

✔ 1. **Patterns.** Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them.

✔ 2. **Cause and effect**. Mechanism and explanation. Events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and explaining causal relationships and the mechanisms by which they are mediated. Such mechanisms can then be tested across given contexts and used to predict and explain events in new contexts.

3. **Scale, proportion, and quantity.** In considering phenomena, it is critical to recognize what is relevant at different measures of size, time, and energy and to recognize how changes in scale, proportion, or quantity affect a system's structure or performance.

4. **Systems and system models.** Defining the system under study – specifying its boundaries and making explicit a model of that system – provides tools for understanding and testing ideas that are applicable throughout science and engineering.

5. **Energy and matter**. Flows, cycles, and conservation. Tracking fluxes of energy and matter into, out of, and within systems helps one understand the systems' possibilities and limitations.

6. **Structure and function.** The way in which an object or living thing is shaped and its substructure determine many of its properties and functions.

✔ 7. **Stability and change.** For natural and built systems alike, conditions of stability and determinants of rates of change or evolution of the system are critical elements of study.

Process Standards

Scientific and Engineering Practices:

- ❑ 1. Asking questions (for science) and defining problems (for engineering)
- ❑ 2. Developing and using models
- ☑ 3. Planning and carrying out investigations
- ❑ 4. Analyzing and interpreting data
- ❑ 5. Using mathematics, information and computer technology, and computational thinking
- ❑ 6. Constructing explanations (for science) and designing solutions (for engineering)
- ❑ 7. Engaging in argument from evidence
- ☑ 8. Obtaining, evaluating, and communicating information

TRANSFER GOAL(S) *Students will be able to independently use their learning to...*

Design and conduct a scientific investigation and communicate results for a self-generated hypothesis.

PERFORMANCE TASK Ideas

Task 1 – *How does exercise affect the pulse rate?*
Design and conduct an investigation that compares normal pulse rate to changes caused by two selected physical activities (e.g., jogging, swimming, push-ups, squats) for designated intervals. Prepare a report including:
• an explanation of homeostasis, oxygen/carbon dioxide feedback loop, effect of pulse rate
• an interpretation of the results
Answer these questions in your report – *How did the pulse rates during exercise compare to the normal (resting) pulse rate? How do CO2 and O2 levels effect the heart rate? How does the heart rate effect pulse rate? How does this affect homeostasis? Is the respiratory rate also affected? • How can your design be improved?*

Task 2 – Design and construct a scientific experiment to test which of four antacids would be the most effective for neutralizing acid. Prepare a (news article, podcast, Power Point slide show, Animoto animation) to communicate your findings to the general public.

*Source: pals.sri.com

Unpacking Standards – "Matrix" Method

The College Board
Advanced Placement Program

WORLD HISTORY

Content Standards

Theme 1: Interaction between humans and the environment
- o Demography and disease
- ✔ Migration
- ✔ Patterns of settlement
- o Technology

Theme 2: Development and interaction of cultures
- o Religions
- ✔ Belief systems, philosophies, and ideologies
- o Science and technology
- o The arts and architecture

Theme 3: State building, expansion and conflict
- o Political structures and forms of governance
- o Empires
- o Nations and nationalism
- o Revolts and revolutions
- o Regional, transregional, and global structures and organizations

Theme 4: Creation, expansion and interaction of
- o Agricultural and pastoral production
- o Trade and commerce
- o Labor systems
- o Industrialization
- o Capitalism and socialism

Theme 5: Development and transformation of social structures
- o Gender roles and relations
- o Family and kinship
- o Racial and ethnic constructions
- o Social and economic classes

Process Standards

Historical Thinking Skills:

✔ ★ **Crafting historical arguments from historical evidence**
- ★ Historical argumentation
- ✔ ★ Appropriate use of relevant historical evidence

★ **Chronological reasoning**
- ★ Historical causation
- ★ Patterns of continuity and change over time
- ❍ Periodization

★ **Comparison and contextualization**
- ★ Comparison
- ★ Contextualization

✔ ★ **Historical interpretation and synthesis**
- ★ Interpretation
- ★ Synthesis

TRANSFER GOAL(S) *Students will be able to independently use their learning to...*

Use primary and secondary sources to produce an informed explanation of *what* happened, *why* it happened, and *how* it impacted the future.

PERFORMANCE TASK Ideas

Consider this questions – *How did the coercive labor systems in the Americas impact the economic growth and cultural patterns of both Africa and the Americas?*
In 1998, UNESCO decreed that August 23rd is the "International Day for the Remembrance of the Slave Trade and its Abolition." The focus of this year's remembrance is how economy shapes public behavior. Prepare a keynote address that describes how coercive labor systems impacted Africa and the Americas both economically and culturally. Be sure to consider alternate points of view in your address as there are some areas of disagreement amongst historians.

Unpacking Standards – "Matrix" Method

Content Standards	Process Standards
	TRANSFER GOAL(S) *Students will be able to independently use their learning to...*
	PERFORMANCE TASK Ideas

Performance List for Graphic Display of Data

(elementary level)

Key Criteria	Points Possible	Self	Other	Teacher
1. The graph contains a title that tells what the data shows.	☐	_____	_____	_____
2. All parts of the graph (units of measurement, rows, etc.) are correctly labelled.	☐	_____	_____	_____
3. All data is accurately represented on the graph.	☐	_____	_____	_____
4. The graph is neat and easy to read.	☐	_____	_____	_____
Total	☐	_____	_____	_____

Performance lists offer a practical means of judging student performance based upon identified criteria. A performance list consists of a set of criterion elements or traits and a rating scale. The rating scale is quite flexible, ranging from 3 to 100 points.

Teachers can assign points to the various elements, in order to "weight" certain elements over others (e.g., accuracy counts more than neatness) based on the relative importance given the achievement target. The lists may be configured to easily convert to conventional grades. For example, a teachers could assign point values and weights that add up to 25, 50 or 100 points, enabling a straightforward conversion to a district or school grading scale (e.g., 90-100 = A, 80-89 = B, and so on). When the lists are shared with students in advance, they provide a clear performance target, signaling to students what elements should be present in their work.

Despite these benefits, performance lists do not provided detailed descriptions of *performance levels*. Thus, despite identified criteria, different teachers using the same performance list may rate the same student's work quite differently.

Performance List for Writing Fiction

Primary Level

	Terrific	O.K.	Needs Work
1. I have an interesting setting and characters for my story.			
2. The problem in my story will be clear to my readers.			
3. My story events are in order.			
4. The solution will be clear to my readers.			
5. I used many describing words to tell what is happening.			
6. My words “paint a picture.”			
7. I have a title that goes with my story.			

What will you try to do better the next time you write a story?

A Rubric Design Process

One effective process for developing a rubric is to begin at the ends. In other words, to develop a rubric to assess degrees of understanding of a "big idea" or complex process, ask: What are indicators of a sophisticated understanding? Contrast these indicators with those of a novice. Similarly, when creating a rubric for skills, distinguish the qualities displayed by an expert compared to a novice. Use the following worksheet to identify specific indicators of novice versus expert.

example: persuasion

novice	***expert***
The novice ...	***The expert ...***
• assumes that presenting a clear position with a reason is sufficient to persuade	• understands that effective persuaders carefully analyze their audience to determine the most persuasive approach
•	•
•	•
•	•
•	•
•	•
•	•

Four Types of Performance Criteria

By what criteria should understanding performances be assessed? The challenge in answering is to ensure that we assess what is central to the understanding, not just what is easy to score. In addition, we need to make sure that we identify the separate traits of performance (e.g. a paper can be well-organized but not informative and vice versa) to ensure that the student gets specific and valid feedback. Finally, we need to make sure that we consider the different types of criteria (e.g. the quality of the understanding vs. the quality of the performance in which it is revealed). The chart below offers ideas for different types of criteria and their associated indicators.

content	process	quality	result
Describes the degree of knowledge of factual information or understanding of concepts, principles, and processes.	Describes the degree of skill/proficiency. Also refers to the effectiveness of the process or method used.	Describes the degree of quality evident in products and performances.	Describes the overall impact and the extent to which goals, purposes, or results are achieved.
accurate appropriate authentic complete correct credible explained justified important in-depth insightful logical makes connections precise relevant sophisticated supported thorough valid	careful clever coherent collaborative concise coordinated effective efficient flawless followed process logical/reasoned mechanically correct methodical meticulous organized planned purposeful rehearsed sequential skilled	attractive competent creative detailed extensive focused graceful masterful organized polished proficient precise neat novel rigorous skilled stylish smooth unique well-crafted	beneficial conclusive convincing decisive effective engaging entertaining informative inspiring meets standards memorable moving persuasive proven responsive satisfactory satisfying significant useful understood

Teaching and Learning for Understanding

What does it mean to teach and learn for understanding?

We have found it useful to consider this question by examining three distinct, yet interrelated, learning goals: 1) acquisition of new information and skill, 2) making meaning of that content (i.e., coming to understand), and 3) transfer of one's knowledge (i.e., applying one's learning to new situations).

These three categories link directly to elements identified in *Understanding by Design*. In Stage 1 teachers specify the knowledge and skill that they intend students to **acquire**. They also decide upon the "big ideas" they want students to come to understand and develop essential questions to help students **make meaning** of those ideas. In Stage 2, teachers develop performance tasks requiring **transfer** as evidence that students understand and can apply their knowledge in authentic contexts.