Designing an Understanding-based Curriculum around Iowa Core Standards

presented by

Jay McTighe
Author and Educational Consultant
e-mail: jaymctighe@verizon.net
Website: jaymctighe.com

Principles of Curriculum for Understanding*

Students presented with vast amounts of content knowledge that is not organized into meaningful patterns are likely to forget what they have learned and to be unable to apply the knowledge to new problems or unfamiliar contexts (Haidar, 1997). Curriculum for understanding provides ample opportunity for students to apply their knowledge in a variety of contexts and conditions. This helps them transfer their learning to new situations and better prepares them for future learning (Bransford and Schwartz, 2000). Providing students with frequent opportunities to apply what they learn in multiple contexts requires a reallocation of instructional time. Allowing time for in-depth learning means decisions must be made about what knowledge is of most worth. For this reason, the curriculum needs to specify clearly the appropriate balance between breadth and depth of coverage in terms of student learning outcomes.

A mathematics or science curriculum for advanced study that promotes learning with understanding:

1. Structures the concepts, factual content, and procedures that constitute the knowledge base of the discipline around the organizing principles (big ideas) of the domain.
2. Links new knowledge to what is already known by presenting concepts in a conceptually and logically sequenced order that builds upon previous learning within and across grade levels.
3. Focuses on depth of understanding rather than breadth of content coverage by providing students with multiple opportunities to practice and demonstrate what they learn in a variety of contexts.
4. Includes structured learning activities that, in a real or simulated fashion, allow students to experience problem solving and inquiry in situations that are drawn from their personal experiences and real-world applications.
5. Develops students' abilities to make meaningful applications and generalization to new problems and contexts.
6. Incorporates language, procedures, and models of inquiry and truth verification that are consistent with the accepted practice of experts in the domain.
7. Emphasizes interdisciplinary connections and integration and helps students connect learning in school with the issues, problems, and experiences that figure prominently in their lives outside of the classroom.

*Source: Committee on Programs for Advanced Study of Mathematics and Science in American High Schools

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 earning 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.

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.

Cautionary Notes about "Unpacking"

"'Unpacking' often results in a checklist of discrete skills and a fostering of skill-and-drill instruction that can fragment and isolate student learning in such a way that conceptual understanding, higher order thinking, cohesion, and synergy are made more difficult. Too often, the process of 'unpacking" is engaged in an attempt to isolate the specific foundational or prerequisite skills necessary to be successful with the ideas conveyed by the overall standard and is a common precursor to test preparation and reductive teaching. Although this process may be important work in some instances and can certainly be enlightening, it also poses substantial problems if those completing the work never take the time to examine the synergy that can be created when those foundational or prerequisite skills are reassembled into a cohesive whole. Metaphorically speaking, 'unpacking' often leads educators to concentrate on the trees at the expense of the forest."

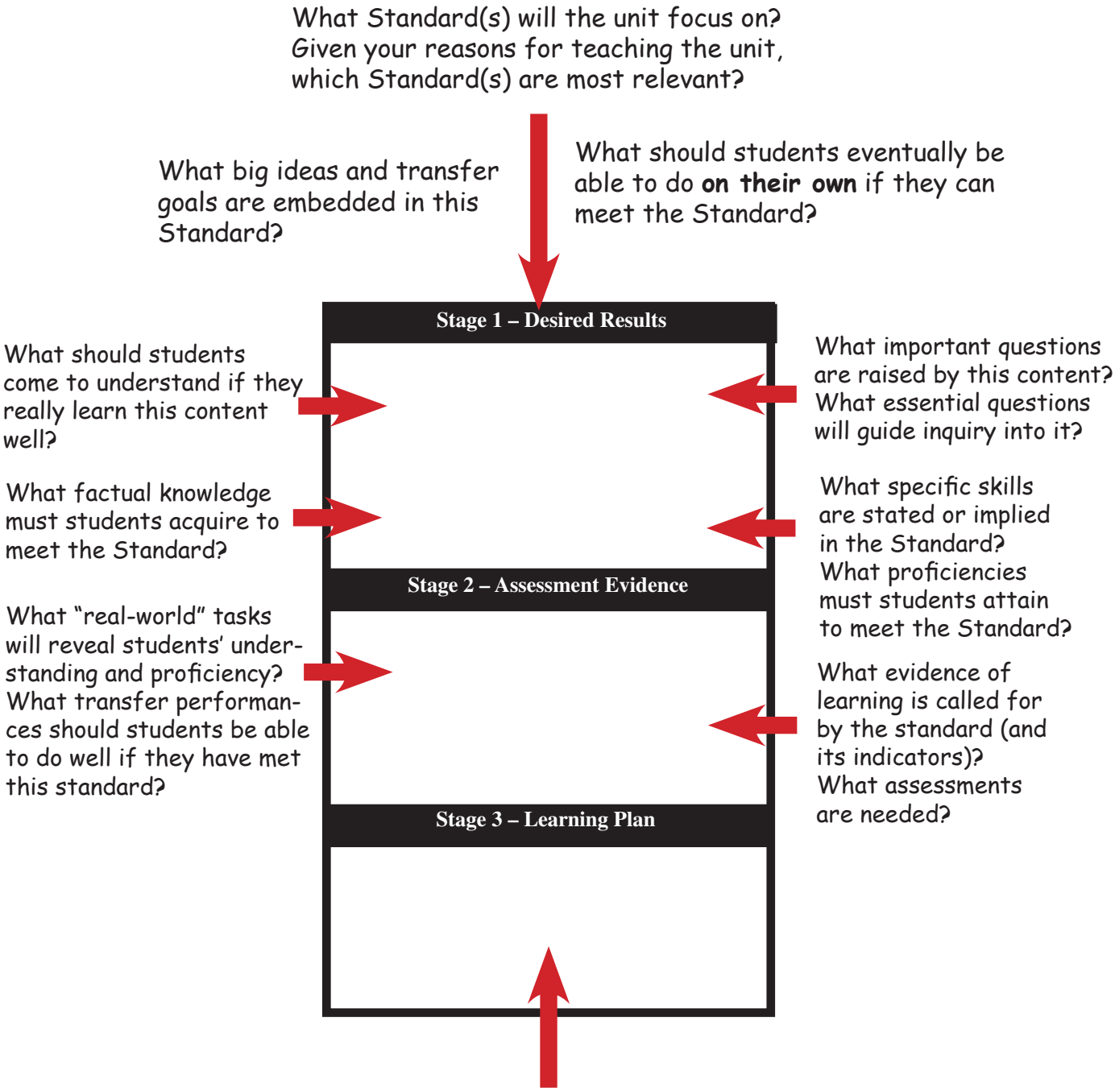
-- Kansas Department of Education

"Fragmenting the Standards into individual standards, or individual bits of standards … produces a sum of parts that is decidedly less than the whole". Breaking down standards poses a threat to the focus and coherence of the Standards. It is sometimes helpful or necessary to isolate a part of a compound standard for instruction or assessment, but not always, and not at the expense of the Standards as a whole. A drive to break the Standards down into 'microstandards' risks making the checklist mentality even worse than it is today. Microstandards would also make it easier for microtasks and microlessons to drive out extended tasks and deep learning.

Finally, microstandards could allow for micromanagement: Picture teachers and students being held accountable for ever more discrete performances. If it is bad today when principals force teachers to write the standard of the day on the board, think of how it would be if every single standard turns into three, six, or a dozen or more microstandards. If the Standards are like a tree, then microstandards are like twigs. You can't build a tree out of twigs, but you can use twigs as kindling to burn down a tree."

-- Publishers' Criteria for the Common Core State Standards for Mathematics

Curriculum Planning with Standards using UbD



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

The Understanding by Design Template 2.0

Frequently Asked Questions

1. Why did you change the UbD Template?
Just as computer software programs are regularly updated to incorporate new ideas and adjustments based on user feedback, the new Template reflects the most current thinking on UbD, based on our own observations and the constant feedback we get from users throughout the world. In particular, we have seen the need to highlight transfer goals and the coding of Stages 2 and 3 because too often well-intentioned designers were not focusing on long-term transfer in their units, and the unit assessments often did not closely align with the stated goals of Stage 1.

2. Do you have to follow the UbD Template order (top to bottom) when you design?
No. Backward design does not demand a rigid sequence. The process of thinking through a design is inherently non-linear, with various entry points, leading eventually to a logically-organized product. Regardless of approach, designers should routinely check the emerging design against the UbD Design Standards to ensure that the process yields a desired high-quality unit design.

3. Should you use the 3-stage UbD Template for planning lessons as well as units?
We do not recommend isolated lesson planning separate from unit planning. We have chosen the unit as a focus for design because the key elements of UbD – understandings, essential questions, and transfer performances – are too complex and multi-faceted to be satisfactorily addressed within a single lesson. For instance, essential questions should be revisited over time, not answered by the end of a single class period.

Nonetheless, the larger unit goals provide the context in which individual lessons are planned. Teachers often report that careful attention to Stages 1 and 2 sharpens their lesson planning, resulting in more purposeful teaching and improved learning.

Wiggins, G. and McTighe, J. (2011) *The Understanding by Design Guide to Creating High Quality Units.* Association for Supervision and Curriculum Development (ASCD).
<http://www.ascd.org/publications/books/109107.aspx>

Stage 1 – Desired Results

Established Goals

What Content Standards, Program and/or Mission related goal(s) will this unit address?

Transfer

Students will be able to independently use their learning to...

What kinds of long-term, independent accomplishments are desired?

Meaning

UNDERSTANDINGS
Students will understand that...

What specifically do you want students to understand?

What inferences should they make?

ESSENTIAL QUESTIONS
Students will keep considering...

What thought-provoking questions will foster inquiry, meaning making, and transfer?

Acquisition of Knowledge & Skill

Students will know...

What facts and basic concepts should students know and be able to recall?

Students will be skilled at...

What discrete skills and processes should students be able to use?

Stage 2 – Evidence

Coding	Evaluative Criteria	Assessment Evidence
Are all of the Desired Results being appropriately assessed?	What criteria will be used in each assessment to evaluate attainment of the Desired Results? Regardless of the *format* of the assessment, what qualities are most important?	**PERFORMANCE TASK(S)** **How will students demonstrate their understanding (meaning-making and transfer) through complex performance?** *Consider the six facets when developing assessments of understanding. Optional: Use the G.R.A.S.P.S. elements to frame an authentic context for the task(s).* **OTHER EVIDENCE** **What other evidence will you collect to determine whether Stage 1 goals were achieved?**

Stage 3 – Learning Plan

Coding

What pre-assessments will you use to check students' prior knowledge, skill levels and potential misconceptions?

Pre-assessment

Progress Monitoring

LEARNING EVENTS

What's the goal for (or type of) each event?

Are all three types of goals (acquisition, meaning, and transfer) addressed in the learning plan?

Does the learning plan reflect principles of learning and best practices?

Is there tight alignment across all three stages?

While detailed lesson plans are not expected here, you should include sufficient information so that another teacher who is familiar with the unit's content could understand and follow the basic learning plan. That means not just stating WHAT learners will do but WHY the event is proposed - its purpose

Optional: Use the column on the left to code your learning activities; e.g., their alignment with Stage 1 elements, T-M-A, or W.H.E.R.E.T.O.

How will you monitor students' progress towards acquisition, meaning-making, and transfer, <u>during</u> lesson events?

What are potential rough spots and student misunderstandings?

How will students get the feedback they need and opportunities to make use of it?

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. For example, 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 in varied 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 can be identified within subject areas as well as for Mission-related, cross-disciplinary outcomes (e.g., 21st century skills and habits of mind).

Transfer goals have several distinguishing characteristics:

- They are long-term in nature; i.e., they develop and deepen over time.
- They are performance based; i.e., require application (not simply recall).
- The application occurs in new situations, not ones previously taught or encountered; 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 excessive hand-holding by a teacher.
- 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

Students will be able to independently use their learning to:

Examples within Subject Areas

Economics
• make economically sound and ethical financial decisions.

History
• Use knowledge of patterns of history to better understand the present and prepare for the future.
• Critically appraise historical claims and analyze contemporary issues.
• Participate as an active and civil citizen in a democratic society.

Health and Physical Education
• Make healthful choices and decisions regarding diet, exercise, stress management, alcohol/drug use throughout one's life.
• Play a chosen game skillfully and with good sportsmanship.

Mathematics
• Make sense of never-before-seen, "messy"problems and persevere in solving them.
• Construct viable arguments involving mathematics and statistics and critique the reasoning of others.

Performing & Fine Arts
• Find at least one arts discipline in which they develop sufficient competence to continue active
involvement in creating, performing, and responding to art as an adult.
• Respond by analyzing and interpreting the artistic communications of others.

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 inferring and tracing the main idea, interpreting ("between the lines"), critically appraising, and making personal connections.
• Enjoy reading as a chosen leisure time pursuit.

Long Term Transfer Goals

Students will be able to independently use their learning to:

Research
• Locate pertinent information from varied sources (print, on-line; primary, secondary).
• Critically evaluate sources and information (e.g., for accuracy, completeness, timeliness, lack of bias, properly referenced).

Science
• Evaluate scientific claims and analyze current issues involving science or technology.
• Conduct a sound investigation to answer an empirical question.

World Language
• Effectively communicate with varied audiences and for varied purposes while displaying appropriate cultural understanding.

Writing
• Write in various genres for various audiences in order to explain (expository), entertain (narrative/poem), argue (persuasive), guide (technical), and challenge (satirical).
• Carefully draft, write, edit, and polish one's own and others' writing to make it publishable.

<u>Examples beyond Subject Areas</u>

Critical Thinking
• Think critically about information and claims encountered at school and beyond by seeking clarity, accuracy, sound evidence, good reasons, and fairness.

Communication
• Effectively communicate for different purposes and varied audiences using appropriate media.

Collaboration
• Work effectively with, and learn from, others in a variety of situations, in school and beyond.

Taking Responsible Risks
• Try something new and different without a paralyzing fear of making mistakes.

Transfer Goals

examples from schools and districts

Science Transfer Goals

Students will be able to independently use their learning to:

- Apply knowledge of science and engineering to engage in public discussions on relevant issues in a changing world.
- Conduct investigations, individually and collaboratively, to answer questions.
- Evaluate scientific claims for validity.
- Think systemically.

Source: North Slope Borough School District, Barrow, Alaska (July 2012)

Visual Arts Transfer Goals

Students will be able to independently use their learning to:

- Create engaging and purposeful artistic expressions in forms that vary in terms of media and style.
- Communicate ideas, experiences, and stories through art.
- Respond to the artistic expression of others through global understanding, critical stance, personal connection, and interpretation.
- Respond to technical and conceptual challenges of his/her own.
- Develop an independent artistic vision.

Source: Sheridan School, Washington, DC (June 2011)

World Languages Transfer Goals

Students will be able to independently use their learning to:

- Communicate effectively in the target language(s) in realistic situations while displaying a sensitivity to culture and context.
- Emulate native speakers.
- Willingly taking risks with language, both within and outside of the classroom.

Source: The Dalton School, New York, NY (March 2012)

Special Education

Students will be able to independently use their learning to:

- Function in the community while respecting social/cultural norms.
- Advocate for their personal needs – academic, behavioral, emotional, and physical.
- Communicate effectively based on purpose, task, and audience using appropriate vocabulary.
- Explore and pursue viable options based on aspirations, interests, and experience.

Source: Prosper ISD, TX (April 2013)

Transfer Goals – Massachusetts

English/Language Arts Transfer Goals

Students will be able to independently use their learning to:

• Understand the power of words and images to transform lives and provide insight into the experiences of others and understanding of cultures and historical periods.
• Read and comprehend a range of increasingly complex texts and media written for various audiences and purposes.
• Generate open ended questions and seek answers through critical analysis of text, media, interviews, and/or observations.
• Communicate ideas effectively in writing to suit a particular audience and purpose.
• Communicate ideas effectively in discourse and oral presentations to suit various audiences and purposes.
• Expand their vocabulary and knowledge of English conventions in order to learn and convey precise understandings of concepts.
• Develop the habit of reading for enjoyment.

History/Social Science Transfer Goals

Students will be able to independently use their learning to:

• Understand how recurring patterns in history can inform judgments about current events and other issues.
• Analyze and resolve conflicts in order to work and live cooperatively with others.
• Understand how physical and human geography can inform responsible interactions with environment.
• Apply knowledge of political and social systems to participate actively as an informed citizen of a democracy.
• Critically appraise historical and contemporary claims/decisions.
• Apply concepts and systems of economics to participate productively in a global economy.

Mathematics Transfer Goals

Students will be able to independently use their learning to:

1. Interpret and persevere in solving complex mathematical problems using strategic thinking and expressing answers with a degree of precision appropriate for the problem context.
2. Express appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others, and attending to precision when making mathematical statements.
3. Apply mathematical knowledge to analyze and model mathematical relationships in the context of a situation in order to make decisions, draw conclusions, and solve problems.

Source: Massachusetts Department of Education, March 2012

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.

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
Visual Art • *In what ways does art reflect culture as well as shape it?* • *How do artists choose tools, techniques, and materials to express their ideas?* **English/Language Arts** • *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?*

Concept Attainment – Essential Questions

Part 1 - Examine the following examples and non-examples to determine the common characteristics of Essential Questions. List these in the box below.

Essential Questions	Not Essential Questions
1. How are "form" and "function" related in biology?	7. How many legs does a spider have? How does an elephant use its trunk?
2. How do effective writers hook and hold their readers?	8. What is "foreshadowing"? Can you find an example of "foreshadowing'" in the story?
3. Who "wins" and who "loses" when technologies change?	9. What is the original meaning of the term, technology (from its Greek root, "techne")?
4. Should it be an axiom if it is not obvious?	10. By what axioms are we able to prove the Pythagorean theorem?
5. What distinguishes fluent foreigners from native speakers?	11. What are some French colloquialisms?
6. How would life be different if we couldn't measure time?	12. How many minutes are in an hour? How many hours are in a day?

List common characteristics of the Essential Questions:

Part 2 - Use your list of characteristics as criteria to determine which of the following are Essential Questions. Check "yes" or "no" after each example.

	YES	*NO*
13. What is the relationship between popularity and greatness in literature?	___	___
14. When was the Magna Carta signed?	___	___
15. Crustaceans – what's up with that?	___	___
16. To what extent are common sense and science related?	___	___
17. Which modern U.S. president will have the most disappointing legacy?	___	___
18. What's the pattern?	___	___

Refine your list of key characteristics of Essential Questions:

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 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

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: _____

What is understanding?

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

Someone who understands...

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***

A Collection of Assessment Evidence

example - unit on Nutrition - grades 5-6

Performance Tasks:

You Are What You Eat – Students create an illustrated brochure to teach younger children about the importance of good nutrition for healthful living.

Camp Menu – Students develop a 3-day menu for meals and snacks for an upcoming Outdoor Education camp experience. They write a letter to the camp director to explain why their menu should be selected (by showing that it meets the USDA Food Pyramid recommendations, yet tasty enough for the students).

Other Evidence:
(e.g., tests, quizzes, prompts, work samples, observations, etc.)

Quiz - the food groups and the USDA recommendations

Quiz - Skill Check – reading food labels for nutrition info.

Prompt - Describe two health problems that could arise as a result of poor nutrition and explain how these could be avoided.

Student Self-Assessment and Reflection:

1. self assess the brochure, You are What You Eat
2. self assess the camp menu
3. self assess the extent to which you "eat healthy" at the end of unit (compared to the beginning)

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

Matrix Method -- Mathematics Common Core Standards

Practice Standards MATH GR 3 **Content Standards**	*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.*
Represent and solve problems involving multiplication and division.								
Understand properties of multiplication and the relationship between multiplication and division.								
Multiply and divide within 100.								
Solve problems involving the four operations, and identify and explain patterns in arithmetic.								
Use place value understanding and properties of operations to perform multi-digit arithmetic.								
Develop understanding of fractions as numbers.								
Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.								
Represent and interpret data.								
Geometric measurement: understand concepts of area and relate area to multiplication and to addition.								
Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.								
Reason with shapes and their attributes.								

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.

Constructing a Performance Task Scenario

G.R.A.S.P.S. example

Goal:

- **The goal (within the scenario) is to** minimize costs for shipping bulk quantities of M&Ms.

Role:

- **You are** an engineer in the packaging department of the M&M Candy Company.

Audience:

- **The target audience** is non-engineer company executives.

Situation:

- **You need to** convince penny-pinching company officers that your container design will provide cost-effective use of the given materials, maximize shipping volume of bulk quantities of M&Ms, and be safe to transport.

Product/Performance and Purpose:

- **You need to** design a shipping container from given materials for the safe and cost-effective shipping of the M&Ms. Then you will prepare a written proposal in which you include a diagram and show mathematically how your container design provides effective use of the given materials and maximizes the shipping volume of the M&Ms.

Standards & Criteria for Success:

- **Your** container proposal should...
  - provide cost-effective use of the given materials
  - maximize shipping volume of bulk quantities of M&Ms
  - be safe to transport
- **Your** models must make the mathematical case.

Constructing a Performance Task Scenario

G.R.A.S.P.S. example

Goal:

- **Your goal is to** help a group of foreign visitors understand the key historic, geographic and economic features of our region.

Role:

- **You are** an intern at the Regional Office of Tourism.

Audience:

- **The audience** is a group of nine foreign visitors (who speak English).

Situation:

- **You have been asked to** develop a plan, including a budget, for a four-day tour of the region. Plan your tour so that the visitors are shown sites that best illustrate the key historical, geographic and economic features of our region.

Product/Performance and Purpose:

- **You need to** prepare a written tour itinerary and a budget for the trip. You should include an explanation of why each site was selected and how it will help the visitors understand the key historic, geographic and economic features of our region. Include a map tracing the route for the tour.
  [Optional: Provide a budget for the trip.]*

Standards & Criteria for Success:

- **Your** proposed tour plan **needs to include**...
  - an itinerary and route map
  - the key historical, geographic and economic features of the region
  - a clear rationale for the selected sites

  *- accurate and complete budget figures

Considering Student Interests

Primary Grades (pre-K – 2)

- animals/pets
- cartoons
- characters (in books, on t.v., etc.)
- community helpers
- dinosaurs
- five senses
- holidays
- planets/outer space
- plants
- seasons
- sharks
- weather/snow
- zoo

Other:

- _____

Intermediate Grades (3 – 5)

- archaeology
- books/literature
- computers - games
- disasters
- famous people
- friends
- games
- geography
- movies
- mysteries
- outer space
- sports
- television/t.v. shows
- video games

Other:

- _____

Middle School (6 – 8)

- amusement parks
- cell phones
- clothing/fashion
- computers – games, e-mail, IM
- disasters
- friends
- games
- jobs/earning money
- music/musical groups
- movies
- science fiction
- shopping
- sports
- television/t.v. shows
- video games

Other: _____

High School (9 – 12)

- automobiles
- careers
- cell phones
- clothing/fashion
- colleges
- computers – games, e-mail, IM
- dating/romance
- friends
- music/musical groups
- jobs/earning money
- shopping
- sports
- travel
- vacations
- video games

Other: _____

Task Variables

The following variables could be considered when designing learning and performance tasks. The desired results, nature and needs of the students, the teacher's style, available resources (time, supplies, equipment, funds) and classroom feasibility.

Student Choice – To what extent will students have choices regarding the following?

❍ task topic ❍ task activities ❍ process for completing task
❍ product(s)/performance(s) ❍ audience(s)

Access to Resources – Will all resources needed (information, supplies, equipment) be provided? To what extent will students be expected to gather information, provide their own supplies/equipment, etc.?

❍ all necessary information/ resources provided ❍ other: _____

Performance Mode – How will students work?

❍ individually ❍ pair/group (optional) ❍ pair/group (required)

Audience(s) for Student Product(s)/Performance(s) – To whom will students present their products and performances?

❍ teacher ❍ other school staff ❍ expert(s) ❍ parents/community
❍ peers (in class) ❍ other students ❍ other: _____

Time Frame – How long will students be involved in this task? Include time for presentations and evaluations.

❍ 1 – 2 class periods ❍ 3 – 5 periods ❍ other:
_____

Degree of Scaffolding – To what degree will students be provided with instructional support (scaffolding) as they work on the task?

❍ no support ❍ some support, as needed ❍ extensive support

Evaluation of Student Product(s)/Performance(s) – Who will be involved in evaluating student products and performances?

❍ teacher ❍ other staff ❍ expert judge(s) ❍ external scorers
❍ student (self evaluation) ❍ peers ❍ other: _____

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?

Holistic Rubric for Graphic Display of Data

3	All data is accurately represented on the graph. All parts of the graph (units of measurement, rows, etc.) are correctly labelled. The graph contains a title that clearly tells what the data shows. The graph is very neat and easy to read.
2	All data is accurately represented on the graph OR the graph contains minor errors. All parts of the graph are correctly labelled OR the graph contains minor inaccuracies. The graph contains a title that suggests what the data shows. The graph is generally neat and readable.
1	The data is inaccurately represented, contains major errors, OR is missing. Only some parts of the graph are correctly labelled OR labels are missing. The the title does not reflect what the data shows OR the title is missing. The graph is sloppy and difficult to read.

A holistic rubric provides an overall impression of a student's work. Holistic rubrics yield a *single* score or rating for a product or performance. Holistic rubrics are well suited to judging simple products or performances, such as a student's response to an open-ended test prompt. They provide a quick snapshot of overall quality or achievement, and are thus often used in large-scale assessment contexts (national, state or district levels) to evaluate a large number of student responses. Holistic rubrics are also effective for judging the "impact" of a product or performance (e.g., to what extent was the essay persuasive? did the play entertain?).

Despite these advantages, holistic rubrics have limitations. They do not provide a detailed analysis of the strengths and weaknesses of a product or performance. Since a single score is generally inadequate for conveying to students what they have done well and what they need to work on to improve, they are less effective at providing specific feedback to students.

A second problem with holistic rubrics relates to the interpretation and use of their scores. For instance, two students can receive the same score for vastly different reasons. Does an overall rating of "3" on a 4-point holistic writing rubric mean that a student has demonstrated strong idea development ("4") and weak use of conventions ("2"), or vice-versa? Without more specific feedback than a score or rating, it is difficult for the student to know exactly what to do to improve.

Analytic Rubric for Graphic Display of Data

weights –	title	labels	accuracy	neatness
3	The graph contains a title that clearly tells what the data shows. ☐	All parts of the graph (units of measurement, rows, etc.) are correctly labelled. ☐	All data is accurately represented on the graph. ☐	The graph is very neat and easy to read. ☐
2	The graph contains a title that suggests what the data shows. ☐	Some parts of the graph are inaccurately labelled. ☐	Data representation contains minor errors. ☐	The graph is generally neat and readable. ☐
1	The the title does not reflect what the data shows OR the title is missing. ☐	Only some parts of the graph are correctly labelled OR labels are missing. ☐	The data is inaccurately represented, contains major errors, OR is missing. ☐	The graph is sloppy and difficult to read. ☐

An analytic rubric divides a product or performance into distinct traits or dimensions and judges each separately. Since an analytic rubric rates each of the identified traits independently, a separate score is provided for each.

Analytic rubrics are better suited to judging complex performances (e.g., research process) involving several significant dimensions. As evaluation tools, they provide more specific information or feedback to students, parents and teachers about the strengths and weaknesses of a performance. Teachers can use the information provided by analytic evaluation to target instruction to particular areas of need. From an instructional perspective, analytic rubrics help students come to better understand the nature of quality work since they identify the important dimensions of a product or performance.

However, analytic rubrics are typically more time-consuming to learn and apply. Since there are several traits to be considered, analytic scoring may yield lower inter-rater reliability (degree of agreement among different judges) than holistic scoring. Thus, analytic scoring may be less desirable for use in large-scale assessment contexts, where speed and reliability are necessary.

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

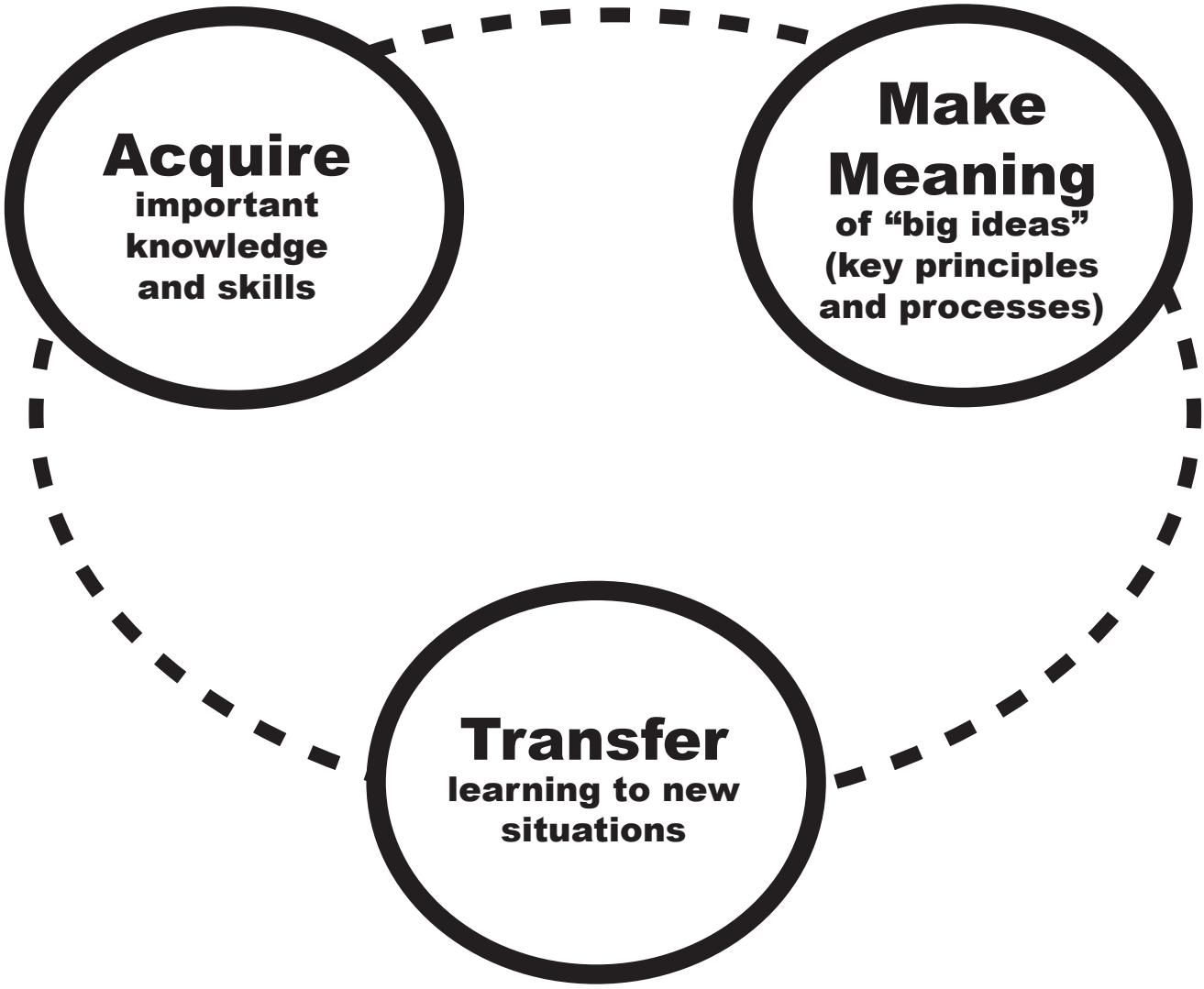
novice	***expert***
The novice ...	***The expert ...***
• assumes that presenting a clear position with a reason is sufficient to persuade	• understands that effective persuaders carefully analyze their audience to determine the most persuasive approach
•	•
•	•
•	•
•	•
•	•
•	•

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.



What is Fair?

Who won this year's 7th grade race around the campus?
Every year at Birdsong Middle School, there is an all-class race. Below are the results for the 7th grade (which is made up of four different classes). But there is a problem: no one agrees on who won! One person thinks Class C should win the trophy because they had the 1st runner overall in the race. Another person thinks Class D should win because they had 3 runners come in under 10th place. A third person says: just find the average. But a 4th person said: wait a minute – Class C had more students in their class than Class D. Averages won't be fair! A 5th person says: use the scoring system in Cross Country – just add up the place of finish of the top 5 finishers in each class and the lowest total wins. A 6th person says – unfair! Some classes did well in the first few runners but poorly in the middle! Why should *they* win? Now, everyone is confused and arguing.

What is the fairest way to determine the winner? Which class should win the trophy?
Your group, well-known in the school as a group of expert mathematicians (and respected for your sense of fairness) is being consulted as to who should win the trophy. What will you recommend and why?

Class rank	Class A	Class B	Class C	Class D
1	4	6	1	2
2	9	7	3	5
3	11	10	14	8
4	12	13	18	15
5	20	16	19	17
6	21	22	23	31
7	25	24	28	33
8	26	27	30	36
9	29	34	32	37
10	35	39	41	38
11	43	40	44	46
12	45	42	47	51
13	49	48	50	55
14	54	52	56	57
15	61	53	60	58
16	65	62	63	59
17	69	66	64	67
18	70	72	68	
19	71		73	
20			74	

Notes on the chart:
• The numbers in the chart, from 1 to 74 represent the place of finish of that runner. So, the overall race winner was from Class C, the number two runner overall was in Class D, etc.
• Class rank refers to the rank of finish place in that class, not the overall race. So, the first runner in class A was 4th overall in the race, the 2nd best runner in class A came in 9th overall, etc.
• The blanks reflect the fact that each of the 4 classes has a different number of students.

Coding a Learning Plan Using A - M - T

A = acquiring basic knowledge and skills **M** = making meaning **T** = transfer

Mathematics Unit on Measures of Central Tendency

Essential Question: *What is fair - and how can mathematics help us answer the question?*

1. Introduce and discuss the essential question, first part - What is "fair"? What is "unfair"? **M**

2. Introduce the 7th grade race problem. Which of the 7th-grade classes won the race? What is a fair way to decide? Small-group inquiry, followed by class discussion of answers. **M**

3. Teacher informs students about the mathematical connections derived from the problem analysis, and lays out the unit and its culminating transfer task. **A**

4. In small-group jigsaw, students share their answers to the INQUIRY sheet, then return to their team to generalize from all the small-group work. Discuss other examples related to the concept of "fairness" such as the following. **M**

- *What is a fair way to rank many teams when they do not all play each other?*
- *What is a fair way to split up limited food among hungry people of very different sizes?*
- *When is it 'fair' to use majority vote and when is it not fair? What might be fairer?*
- *Is it fair to have apportioned Representatives based on a state's population, yet have two Senators from each state irrespective of their size? What might be fairer?*
- *What are fair and unfair ways of representing how much money the "average" worker earns, for purposes of making government policy?*

5. Teacher connects the discussion to the next section in the textbook - measures of central tendency (mean, median, mode, range, standard deviation). **A**

6. Students practice calculating each type of measure. **A**

7. Teacher gives quiz on mean, median, mode from textbook. **A**

8. Teacher leads a review and discussion of the quiz results. **A M**

9. Group task worked on in class: What is the fairest possible grading system for schools to use? **M T**

10. Individuals and small teams present their grading policy recommendations and reasons. **M T**

11. Culminating transfer task: Each student determines which measure (mean, median or mode) should be used to calculate <u>their</u> grade for the marking period and writes a note to the teacher showing their calculations and explaining their choice. **T**

12. Students write a reflection on the essential question and their learnings as a result of the unit. **M**

Ideas for Diagnostic (Pre-) Assessment

The following pre-assessment techniques provide efficient diagnostic checks of student prior knowledge and misconceptions. This information guides any differentiated instruction/ assessment that may be needed. Pre-assessments should NOT be graded.

K-W-L-S

Prior to the introduction of a new topic or skill, ask students what they already **K**now (or think they know) about the topic or skill. These are recorded on a board or chart paper under the "K" column. (Sometimes, students make statements that are incorrect or reveal misconceptions.)

Secondly, ask them what they **W**ant to know (or what questions they have) about the topic/skill. These are recorded under the "W" column. (Their questions often reveal interests or "hooks" to the topic. In some cases, their questions reveal misconceptions that will need to be addressed.)

As the lesson or unit proceeds, **L**earnings are summarized and recorded in the "L" column as they occur. (This provides an opportunity to go back and correct any misconceptions that may have been initially recorded in the "K" column.)

Pre-Test

Give students a pre-test to check their prior knowledge of key facts and concepts. Use the results to plan instruction and selection of resources. (Make sure that students know that the results will not count toward final grades.)

Skills Check

Have students demonstrate their proficiency with a targeted skill or process. It is helpful to have a proficiency checklist or developmental rubric to use in assessing the degree of skill competence. Students can then use the checklist or rubric for on-going self assessment.

Web/Concept Map

Ask students to create a web or concept map to show the elements or components of a topic or process. This technique is especially effective in revealing whether students have gaps in their knowledge and the extent to which they understand relationships among the elements.

Misconception Check

Present students with common errors or predictable misconceptions regarding a designated topic, concept, skill or process. See if they are able to identify the error or misconception and explain why it is erroneous or flawed. The misconception check can also be presented in the form of a true-false quiz, where students must agree or disagree with statements or examples.

Formative Assessment – Whole Group

The following on-going assessment techniques can be used to obtain a quick "pulse check" of a whole class or group of students.

Hand Signals
Ask students to display a designated hand signal to indicate their understanding of a designated concept, principle, or process. For example,

1. I understand _____ and can explain it (e.g., thumbs up)
2. I do not yet understand _____ . (e.g., thumbs down)
3. I'm not completely sure about _____ . (e.g., wave hand)

White Boards
Have students record a response on a white board and hold it up. For example,

Prediction – *What number should appear next in the sequence?*
Agree/Disagree – *Is this an example of adaptation?*

Student Response Systems
Use SRS "clickers" to have students record a response to a question or a prompt. The results can be tabulated on the teacher's computer to provide immediate feedback.

Misconception Check
Present students with common or predictable misconceptions about a designated concept, principle, or process. Ask them to agree or disagree. Student can respond using hand signals, white boards, SRSs, or on paper.

"Quick Writes" and Exit Cards ("Ticket to Leave")
Periodically, distribute index cards or slips of paper and ask students to complete the cards. Here are sample prompts:

- What are the most important things you learned about ____?
- What do you understand about _____?
- What don't you understand yet? What questions do you have?

Quick Writes can be used at the beginning of a class. Exit cards are typically completed at the conclusion of a class period or the end of the week, etc.
Scan the responses, looking for patterns (e.g., when students have the same questions).

Observations
Carefully observe students as they work or respond to questions. Observe the work they produce. What areas of strength and weakness do you notice?

Formative Assessment – Individuals

The following on-going assessment techniques provide a quick check of the knowledge, skill levels, and degree of understanding of individual students. Of course, **oral questioning** and **observation** can be used to provide on-going assessment of individuals.

Exit Card ("Ticket to Leave")
Periodically, distribute index cards and ask students to complete the cards at the conclusion of a class period, end of the week, etc. Students must include their names.

Example #1: I.Q. Card
Side 1 – Based on our study of (unit topic), list a "big idea" that you understand in the form of a summary statement.
Side 2 – Identify something about (unit topic) that you do not yet fully understand (as a statement or a question).

Example #2: 3-2-1- summary
List 3 things that you learned about _____(topic or skill)_____.
List 2 examples or applications of _____.
Liat 1 question that you have about _____(topic or skill)_____.

Example #3: What's Working?
Side 1 – List the things that are helping you learn.
Side 2 – Identify things that have been difficult or are not working for you.

Weekly Letter
Have students write a letter to the teacher and parents summarizing what they have learned during the past week. Students are asked to reflect on their progress during the week and set a learning goal for the upcoming week.

Web/Concept Map
Ask students to create a web or concept map to show the elements or components of a topic or process. This technique reveals if students understand relationships among elements.

One-Minute Essay
Periodically, have students complete a brief "essay" summarizing what they think they understand about a given topic.

Question Box/Board
Establish a location (e.g., question box, bulletin board, e-mail address) where students may post questions about things that they do not understand. (This technique may be preferred by those students who may be uncomfortable admitting publicly that they do not understand.)

Teaching and Assessing for Understanding – Observable Classroom Indicators

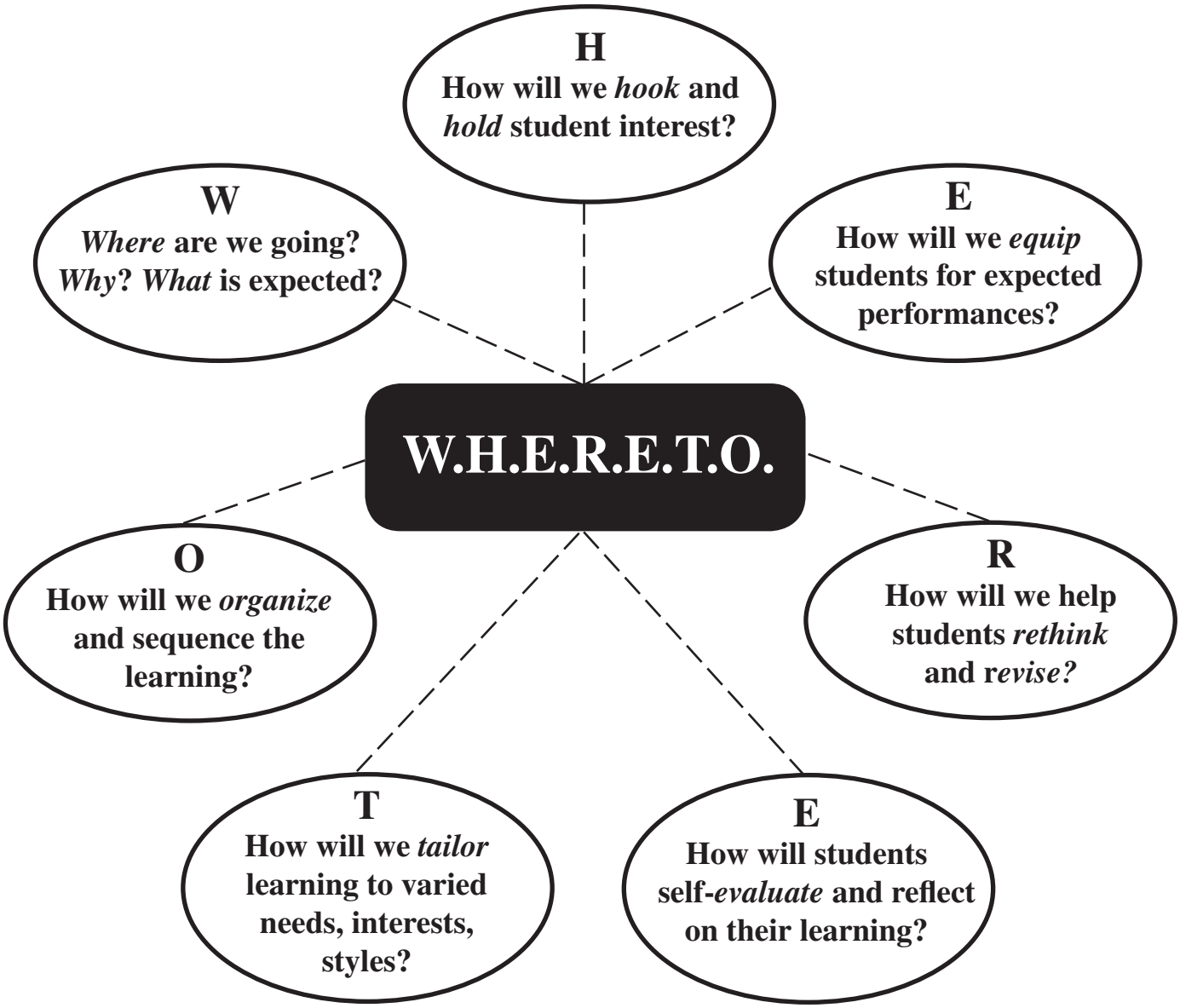
To what extent are...

1. Instruction and assessment focused on "big ideas" and essential questions based on established standards/outcomes?	**4**	**3**	**2**	**1**
2. Essential questions posted and revisited throughout a unit?	**4**	**3**	**2**	**1**
3. Pre-assessments used to check students' prior knowledge and potential misconceptions regarding new topics of study?	**4**	**3**	**2**	**1**
4. Opening "hooks" used to engage students in exploring the big ideas and essential questions?	**4**	**3**	**2**	**1**
5. Students' understanding of the "big ideas" and core processes assessed through authentic performance tasks involving one or more of the six facets?	**4**	**3**	**2**	**1**
6. Evaluations of student products/performances based upon known criteria/rubrics, performance standards, and models (exemplars)?	**4**	**3**	**2**	**1**
7. Appropriate instructional strategies used to help learners' **acquire** knowledge and skills, **make meaning** of the big ideas, and **transfer** their learning?	**4**	**3**	**2**	**1**
8. Students given regular opportunities to rethink, revise and reflect on their work based on feedback from on-going (formative) assessments?	**4**	**3**	**2**	**1**
9. The students expected to self-asses/reflect on their work/ learning and set goals for improvement?	**4**	**3**	**2**	**1**
10. Other: _____	**4**	**3**	**2**	**1**

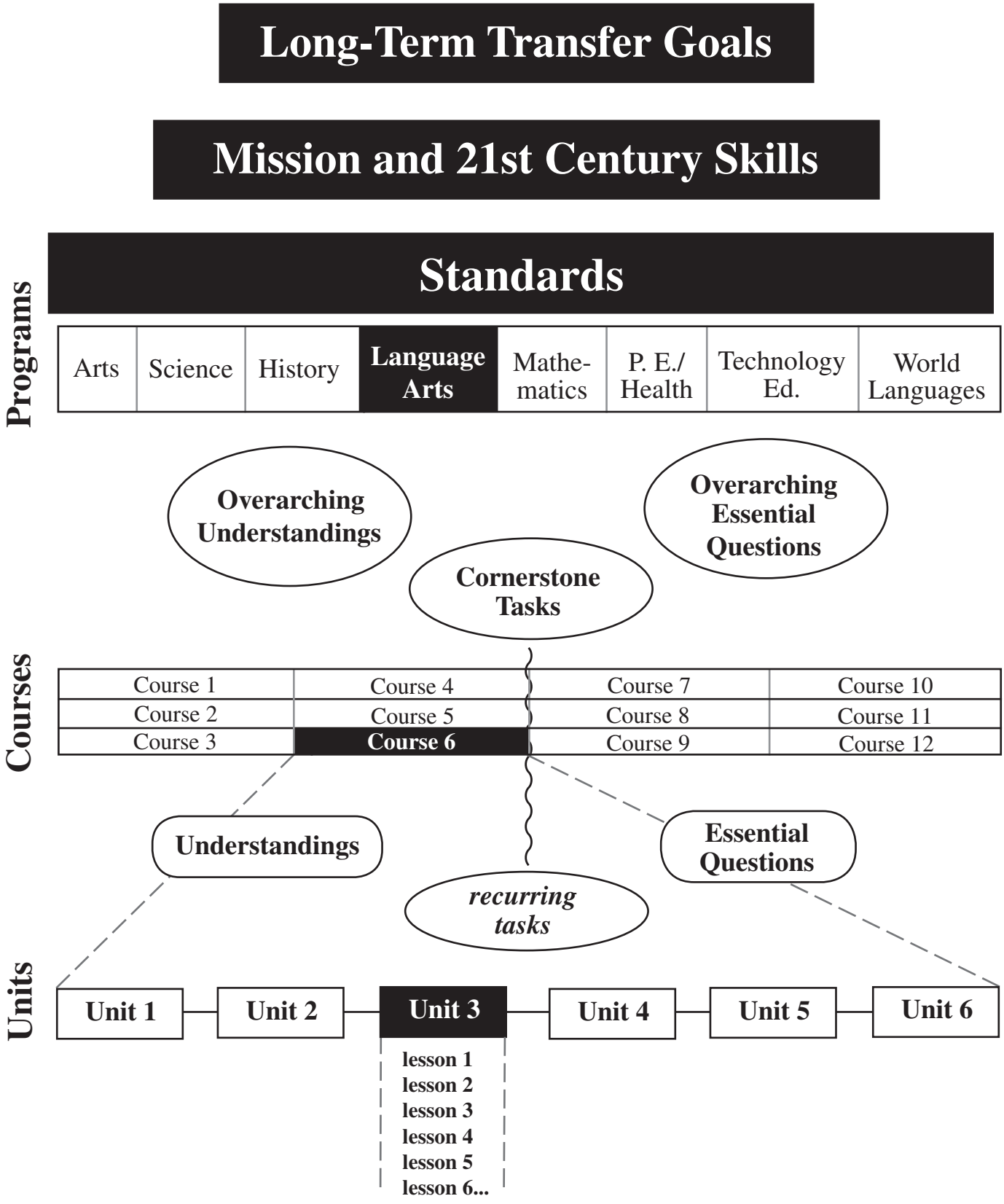
W.H.E.R.E.T.O.

Considerations for the Learning Plan

The acronym W.H.E.R.E.T.O. summarizes the key elements that should be found in your learning plan, given the desired results and assessments drafted in Stages 1 and 2. Note that the elements need not appear in the same order as the letters of the acronym. Think of W.H.E.R.E.T.O. as a checklist for building and evaluating the final learning plan, not a suggested sequence. For example, the learning might start with a Hook (H), followed by instruction on the final performance requirements (W), then perhaps some rethinking of earlier work (R), etc.



A Blueprint for Curriculum Design



Unpacked Common Core E/LA Standards

Anchor Standards - Reading	Overarching Understandings	Essential Questions
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.	• Effective readers use appropriate strategies (as needed) to construct meaning from texts. • Identifying a text's genre, purpose, and organizational structure helps readers analyze and comprehend the text. • Readers support their conclusions (inferences and interpretations) by citing appropriate details within the text. • Great literature is intentionally crafted to explore enduring human themes transferrable across time and place. • Writers don't always say things directly or literally; sometimes they convey their ideas indirectly (e.g., metaphor, satire, irony). • Critical readers question the text, consider different perspectives, and look for author bias.	*• What do good readers do?* *• What's my strategy for reading this text? How do I know if it is working?* *• What is this text really about? (e.g. theme, main idea, moral)?* *• What is the author trying to tell me?* *• What does a "close" reading require?* *• How do you "read between the lines?"* *• What does this mean to me?* *• How does what I read (e.g. text structure, story elements) influence how I should read it?* *• How does my purpose influence how I should read?* *• How do people, events and ideas develop within the text?* *• How do I know what to believe in what I read?*
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.	• Effective readers use appropriate strategies (as needed) to construct meaning from texts. • Authors can express similar ideas within and across genres. • By comparing texts, readers often gain greater insight into those texts. • Readers can use context clues to determine meaning of words/ phrases/ concepts.	*• What do good readers do?* *• What's my strategy for reading this text? How do I know if it is working?* *• How does what I read (e.g. text structure, story elements) influence how I should read it?* *• What insights can we gain by comparing two (or more) texts?* *• How do I figure out the meaning of unknown words/ phrases/ concepts?*

Unpacked Common Core E/LA Standards

Anchor Standards - Reading	Overarching Understandings	Essential Questions
Craft and Structure *(continued)* 6. 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. 7. Assess how point of view or purpose shapes the content and style of a text.	• Texts have structures and follow a predictable sequence. • Identifying a text's genre, purpose, and organizational structure helps readers analyze and comprehend the text. • Determining an author's point of view helps the reader better interpret and explain the text.	• *How do authors develop ideas, characters, and events within the text?* • *How do authors use language and stylistic choices to convey their meaning?* • *What's the author's point of view? How does it influence author's message and reader's interpretation?*
Integration of Knowledge and Ideas 8. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words. 9. 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. 10. Analyze the meanings of literary texts by drawing on knowledge of literary concepts and genres. 11. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.	• Effective readers use appropriate strategies (as needed) to construct meaning from texts. • Effective readers use efficient strategies to efficiently locate, integrate, and evaluate content from diverse sources for various purposes. • Readers make meaning through a careful reading of the text(s) and personal connections to the topic. • The effectiveness of an argument depends on the clarity of the claims, the logic of the reasoning, and the supportive evidence. • Identifying a text's genre, purpose, and organizational structure helps readers analyze and comprehend the text. • By comparing texts, readers often gain greater insight into those texts.	• *What do good readers do?* • *What's my strategy for reading this text? How do I know if it is working?* • *How do I use text features (e.g. photographs, charts) to better comprehend the text?* • *How do I find the information I need? How do I know what to believe in what I find?* • *What makes an argument effective? How do I evaluate an argument?* • *What insights can we gain by comparing two (or more) texts?*

Unpacked Common Core E/LA Standards

Anchor Standards - Reading	Overarching Understandings	Essential Questions
Range of Reading and Level of Text Complexity 5. Read and comprehend complex literary and informational texts independently and proficiently.	• Effective readers use appropriate strategies (as needed) to construct meaning from texts. • Readers make meaning through a careful reading of the text(s) and personal connections to the topic. • Knowing the structure of the language helps facilitate meaning. • As one's knowledge base increases, the quality of thinking, meaning-making and communication can improve.	*• What do good readers do?* *• What's my strategy for reading this text? How do I know if it is working?* *• What is this text really about? (e.g. theme, main idea, moral)?* *• What is the author trying to tell me?* *• How do my experiences influence my reading and understanding of this text?* *• In ways do the interpretations of other readers influence my own understanding of the text?* *• How does understanding the structure of language help us read a text?*
Literature	• Great literature explores universal and timeless themes, dilemmas, and challenges of human existence. • Literature can offer insights into a particular culture/time period. • Everybody is entitled to an opinion about what a text means, but some opinions are more supportable by the text than others.	*• Why read literature?* *• What makes a story "great?"* *• To what extent is this text timeless/ universal?* *• What "truths" can we learn from fiction?* *• What does this literature reveal about a culture/time period?* *• What is this text really about? (e.g. theme, main idea, moral)* *• What does this mean to me?* *• How do I support my interpretation?*

Unpacked Common Core E/LA Standards

Anchor Standards - Writing	Overarching Understandings	Essential Questions
Text Types and Purposes • Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. • Write informative/ explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. • Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.	• Writing is a process for clarifying as well as expressing one's thinking. • To be effective, an argument must be supported with sound evidence and valid reasoning. • Audience and purpose influence a writer's choice of organizational pattern, language, and literary techniques to elicit an intended response from the reader.	*• What makes clear and effective writing?* *• Why am I writing? What is my purpose?* *• Who is my audience? What will work best for my audience?* *• What makes an argument persuasive?* *• How do I support my argument?*
Production and Distribution of Writing • Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. • Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. • Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.	• Proficient writers make deliberate choices regarding content, language, and style to convey their message to a target audience. • Writing is strengthened through a recursive process involving planning, revising, editing, and rewriting or trying a new approach. • A writer's choice of language and style establish "voice" to help personalize the text. • Effective writers seek and use feedback to improve the quality of their writing. • Different publishing media (e.g. digital, print) influence content, structure, and style.	*• Why am I writing? What is my purpose?* *• Who is my audience? What will work best for my audience?* *• How do I develop and refine my idea(s)?* *• How do effective writers hook and hold their readers?* *• What makes writing flow?* *• How do I develop my writer's voice?* *• How can I get and use helpful feedback to improve my writing?* *• What revisions/edits do I need to make to improve my writing?* *• How do I engage my audience throughout my writing?* *• How do I know when my writing is ready to publish?* *• What's the best medium for my message?* *• How does where I publish influence how I write?*

Unpacked Common Core E/LA Standards

Anchor Standards - Writing	Overarching Understandings	Essential Questions
Research to Build and Present Knowledge • Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation. • Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism. • Draw evidence from literary or informational texts to support analysis, reflection, and research.	• There are multiple sources of information and those selected depend on the purpose and audience for writing. • Effective researchers evaluate the credibility and accuracy of information. • Clear and focused questions help researchers find desired information. • Effective research involves a recursive inquiry process that includes: o defining problem/task; o generating focus question(s); o searching for information; o critical evaluating and selecting information; o organizing and synthesizing information; o presenting findings and conclusions with proper support; o judging overall effectiveness. • There are clear rules and laws for acknowledging and documenting sources: to honor the preceding research, enhance the credibility of the research, and to foster the work of other researchers.	• *What am I looking for and how do I find it?* • *Can this source be trusted?* • *How do I know what to believe in what I read, hear and view?* • *How do I collect, organize and synthesize information?* • *Why and how should I document my sources?* • *How do I best present my findings?* • *How can I support my findings and conclusions?*
Foundational Skills	• Rules of grammar, spelling and mechanics are conventions of language that guide writers and readers. • Effective writers adhere to established rules of grammar, spelling, mechanics to ensure clarity of communication.	• *Why do we have/need rules of language?*

Overarching Essential Questions
MATHEMATICS

I. How is mathematics used to quantify and compare situations, events and phenomena?

II. What are the mathematical attributes of objects or processes and how are they measured or calculated?

III. How are spatial relationships, including shape and dimension, used to draw, construct, model and represent real situations or solve problems?

IV. How is mathematics used to measure, model and calculate change?

V. What are the patterns in the information we collect and how are they useful?

VI. How can mathematics be used to provide models that help us interpret data and make predictions?

VII. What are the limits of mathematical modeling/representation?

VIII. In what ways can data be expressed so that its accurate meaning is concisely presented to a specific audience?

IX. How do the graphs of mathematical models and data help us better understand the world in which we live?

X. What does it mean to reason mathematically?

XI. How can mathematics support effective communication?

XII. What do effective problem solvers do? What do they do when they get stuck?

– adapted from Pomperaug Region #15 Schools, CT

Overarching Essential Questions for the CCSS Mathematical Practice Standards

1. Make sense of problems and persevere in solving them.
What kind of a problem is this? What must be found? What is known? What is unknown? What counts as an adequate solution? Does my answer make sense? Does my approach make sense? What should I do if I'm stuck solving it? What similar problems does this remind me of? What simpler or special cases can help me?

2. Reason abstractly and quantitatively.
What's the abstract relationship between these specific quantities? What does this quantitative relationship mean? How can I decontextualize the numbers to find a mathematical relationship? Have I represented the relationships between the quantities appropriately? Which operations and equivalences will simplify and help me solve the problem? Does my abstract representation of these quantities make sense in context?

3. Construct viable arguments and critique the reasoning of others.
Has this been proven? What is assumed? On what assumptions does that inference depend? Where might this assumption logically lead? Is the conclusion logical? Is the conclusion plausible? Have I sufficiently supported my answer and shown my work? Which of these solutions is more plausible? Does this argument make sense? What might be counter-evidence and counter arguments to what I have concluded?

4. Model with mathematics.
What mathematics applies to this situation and this data? What simplifications or approximations, should I make in order to make a mathematical model of this phenomena/data/experience? How might the model be refined to be less simplistic and crude? Does this model make sense in this context? How might I test this model? What are the limits of this (or any) mathematical model? How might this model be improved?

5. Use appropriate tools strategically.
What tools should I use here to be most efficient and effective? What are the strengths and weaknesses of the tools at hand, and might there be better ones for the task? Where might I find more helpful resources when needed?

Overarching Essential Questions for the CCSS Mathematical Practice Standards

(continued)

6. Attend to precision.
What is the appropriate degree of precision for this particular data and solution? Have I made my data, reasoning, and conclusion sufficiently clear (for this audience and purpose)? What terms need to be clearly defined? Have I tested the accuracy of my answer? How sure am I? How much statistical confidence should we have in the answer?

7. Look for and make use of structure.
What's the underlying pattern here? What's the whole, if that's a part? What are the parts, if that's the whole? What type of problem is this? What equivalences or re-constitutions of the problem are likely to help me see a pattern or structure? What shift of perspective might make the solution path more evident?

8. Look for and express regularity in repeated reasoning.
What regularities suggest a constant relationship at work? What is a summary or shorthand way of expressing these recurring patterns? What patterns are evident? Am I sure that the general pattern recurs or is my sample too small? Is that a reasonable way to describe the perceived patterns?

From: McTighe, Jay and Wiggins. Grant *Essential Questions: Doorways to Student Understanding* (ASCD, in press)

Overarching Essential Questions for the NGSS Cross-Cutting Concepts

Crosscutting Concept #1: Patterns
How can patterns be used to predict results and solve problems?
What is the relationship between patterns and natural phenomena?
What is involved in identifying a pattern?
How can you use identified patterns to justify claims?

Crosscutting Concept #2: Cause/Effect
Why is understanding cause and effect important to your life?
How can cause and effect relationships help predict or explain future events?
How can data mislead you in determining a cause & effect relationship?
How do you distinguish between a cause and a correlation?

Crosscutting Concept #3: Scale, Proportion and Quantity
How do scale, proportion and quantity affect what can be observed?
How do conceptual models allow me to observe and test what I cannot see?
How can mathematical models be used to understand and/or predict scientific events?

Crosscutting Concept #4: Systems and System Models
What is a system?
How are the parts of a system related to the entire system?
How are system models used to predict and understand real world situations or scientific phenomena?

Crosscutting Concept #5: Matter and Energy
What is energy, and what does it mean for it to be conserved?
How are energy and matter related?
How is energy measured?

Crosscutting Concept #6: Structure and Function
What is the connection between structure and function?
How does structure and function apply to a given problem?
What affects structure and function?

Crosscutting Concept #7: Stability and change
How do we measure change?
How can something appear stable when it is actually changing?
How does scale affect our ability to observe change?

Overarching Essential Questions for the NGSS Science And Engineering Practices

Practice #1: Asking Questions and Defining Problems
What are the characteristics of a good, testable question?
What are the characteristics of a problem worth investigating?
Which questions would you ask if you obtained unexpected results?

Practice #2: Developing and Using Models
How does your model relate to the real world?
What are the advantages and limitations of a model?
When and why is it appropriate to change a model?

Practice #3: Planning and Carrying Out Investigations
How does planning for a scientific investigation address data collection that is valid, reliable, ethical and repeatable?
Why is it important to collect data about the performance of a proposed tool, object, process or system under a range of conditions?

Practice #4: Analyzing and Interpreting Data
How are graphical representations of large data sets constructed and used to identify relationships?
How can we analyze data with more precision and accuracy?
Why is error analysis important?

Practice #5: Using Mathematics and Computational Thinking
How can mathematics be used to solve problems?
How can mathematics be used to communicate an idea and/or defend an argument?
When and how can mathematical ideas and data be generalized?

Practice #6: Constructing Explanations and Designing Solutions
How can we identify when something is (or is not) a solution to a problem?
How can data be used to summarize and/or draw conclusions about an experiment?
When is it appropriate to use numerical data/patterns and the results of an experiment to make generalized statements about science?
Why is it important to consider the constraints and/or criteria when designing and evaluating solutions?

Practice #7: Engaging in Argument from Evidence
How do scientists respond to different perspectives?
Why is it important to acknowledge the weaknesses of your argument?
How do you construct an argument using evidence to evaluate a scientific claim?

Practice #8 – Obtaining, Evaluating, and Communicating information
How do we decide what to believe about a scientific claim?
How can we make an informed decision?
What are the benefits of communicating information in multiple ways?
How does science change over time?

Source: Stevenson High School Science Department and Feeder Middle School Science Teachers

Deriving Essential Understandings and Questions from VISUAL ARTS Standards

Standard 1. Understands that visual art communicates different ideas, experiences and stories to the viewer

- *What is the purpose of art?*
- *How do we understand what is communicated visually?*
- *What is important about art?*
- *How does art tell us about a place or time?*
- *Why do we need special vocabulary to discuss art?*

Standard 2. Understands that history, culture and the visual arts influence each other

- *Who is an artist?*
- *Why make art?*
- *How have artists in other times and places communicated?*
- *What is the connection between media and time period?*
- *Who is an artist responsible to? (themselves, the community, the world, etc.)*

Standard 3. Understands that the visual arts can be evaluated based on various criteria

- *What is art?*
- *What makes art "good"? What makes art "bad"?*
- *What is the difference between how a subject appears and how we think of it?*

Standard 4. Understands that artists vary media, techniques and processes according to their purpose

- *What effect does working in different styles of Art have?*
- *How is art like other pieces that authors and musicians create?*
- *Is there a particular way a media should or should not be used?*
- *What is the connection between media and time period?*
- *How does the media influence the message?*

Standard 5. Identifies, uses, and adjusts principles of design effectively and according to purpose.

- *How can we make a work of art appear to be unified? Why does it matter?*

Standard 6. Identifies, uses, and adjusts elements of art effectively and according to purpose.

- *What is the connection between color and emotion?*
- *How can we arrange the elements of art to express our ideas and knowledge?*

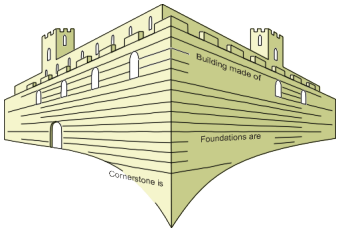
Framing a Course Using Essential Questions

Biology **Key Topics** **Essential Questions**	The Cell	Heredity	Evolution	Taxonomy	Viruses, Protists, Fungi & Bacteria	Plants	Invertebrates & Vertebrates	Ecology and Interaction	Human Body Systems	Ethics of Biology
What are we made of? What is everything made of? What makes any living thing what it is? What is "alive"?	✔	✔		|			|		✔	|
How are structure and function related in living things? Why does this creature do this and look like that?	✔			|		✔	|	✔	✔	|
How are characteristics of living things passed on through generations? What is inherited and how does it happen? What is 'nature' and what is 'nurture'? What's determined and what's an accident? How and in what ways are accidents beneficial?		✔	✔	|			|			|
What is that creature? How do we know? What's in a name?How should we classify the things around us?				|	✔	|		✔	|
How do living things obtain and use energy? Coordinate the actions of cells and organs? Move nutrients? Breathe? Manage water, salts, and wastes?	✔			|			|			|
How much interaction, stress, growth, and change (to individuals and species) is possible, even desirable, biologically?	—	—	—	+	—	—	—	—	—	—	+
What is the evidence for evolution? How much of the controversy is science-based and how much is cultural?			✔	|			|			|
How do diseases and medicines work? What can biology teach us about human health?	✔	✔		|			|			|
What analogies have been most helpful in understanding life? How and when do the analogies permit and how and when do they inhibit further understanding?	—	—	—	—	—	—	—	—	—	—	—
Is there a moral limit to how far we should go in tinkering with human bodies and life more generally?	—	—	—	—	—	—	—	—	—	—	—

Framing a Course Using Essential Questions

French I Key Topics / **Essential Questions**	1.1 Use oral and written language to provide information, exchange ideas, and explain concepts in formal and informal communications.	1.2 Comprehend the main ideas and significant details in oral and written presentation in the target language.	1.3 Use accurate pronunciation and culturally appropriate gestures to clarify meaning and intent in formal and informal situations.	1.4 Determine when the comprehension of language surpasses the ability to produce it, and use circumlocution to successfully communicate messages.	3.1 Analyze how linguistic elements are used to convey meaning in the home and target languages.	3.2 Analyze how grammatical structures of the target language correlate to the home language.
What are the similarities and differences between French and English? How can English help me learn French? How can it hold me back?						
What strategies can help me to retain as much as possible in long-term memory?						
How can I use context to understand words I do not know? What cues do I listen and watch for before I respond?						
What are key rules for making sense of the gender of nouns, pronunciation, syntax?						
What do I do when I am stuck? How can I keep the conversation going?						
How can body language help or hinder my ability to communicate or understand?						
How can I sound more like a native? What do I want to avoid as much as possible?						
What is it like to be a "foreigner"? What are its benefits, given the discomforts?						
How can I describe the people and culture without stereotyping them?						

Cornerstone Tasks



The pressures of high-stakes accountability testing have led many schools and districts to encourage their teachers to engage in "test prep" instruction, especially in the tested grades and subject areas. Additionally, there has been an increase in the use of "interim" or benchmark assessments that mimic the state tests. While these practices may have their place, they typically focus on decontextualized content knowledge and skills at the expense of more relevant and engaging learning. As a counter-balance to "test prep" teaching and "practice" testing, Grant Wiggins and I have argued for the inclusion of more robust and authentic tasks as part of a local curriculum and assessment system. We refer to these as "cornerstone" tasks.

The Cornerstones are curriculum-embedded tasks that are intended to engage students in applying their knowledge and skills in an authentic context. Like a cornerstone anchors a building, these tasks are meant to anchor the curriculum around the most important performances that we want learners to be able to do (on their own) with acquired content knowledge and skills. They honor the intent of the Standards, within and across subject areas, instead of emphasizing only the tested (a.k.a. "eligible") content. Moreover, they support effective instructional practices that engage learners in "meaning making" and transfer.

More specifically, Cornerstone tasks:

- are *curriculum embedded* (as opposed to externally imposed);
- *recur across the grades*, becoming increasingly sophisticated over time;
- establish *authentic contexts* for performance;
- call for *understanding* and *transfer* via genuine performance;
- may be used as rich learning activities *or* assessments;
- *integrate 21st century skills* (e.g., critical thinking, technology use, teamwork) with subject area content;
- evaluate performance with established *rubrics*;
- engage students in *meaningful learning* while encouraging the best teaching;
- provide content for student portfolios so that they graduate with a *resume of demonstrated accomplishments* rather than simply a transcript of courses taken.




Cornerstone Assessments in Writing (6-12)

GREECE CENTRAL SCHOOL DISTRICT, NY

GRADE	Expository	Persuasive	Literary Analysis	Creative/ Expressive
Grade 6	Research report	Position paper	Literary essay on setting or conflict	Original myth
Grade 7	Autobiography	Policy evaluation	Literary essay on character	Persona writing
Grade 8	Research report	Problem/ solution essay	Literary essay on symbolism	Narrative fiction
Grade 9	Cause/effect essay	Editorial	Analysis of multiple literary elements	Poetry
Grade 10	Research report	Social issue essay	Critical Lens essay	Historical Persona
Grade 11	Definition essay	Argumentative essay	Comparative genre essay	Parody/satire
Grade 12	Research paper	Position paper	Response to literary criticsm	Irony

The Literacy Design Collaborative Task Templates

Funded through the Bill and Melinda Gates Foundation, the Literacy Design Collaborative (LDC) has developed a set of Modules designed to support the integration of the Common Core Standards (6-12) in English/ Language Arts with core content in Science, Social Studies and Technical areas. Each Module consists of a task and associated instructional procedures intended to provide a rigorous, authentic classroom experience for students at the secondary level.

The Tasks require students to read, analyze, and comprehend written materials and then write cogent arguments, explanations, or narratives in the subjects they are studying. A key feature of the LDC's work is a set of generic Task Templates -- fill-in-the-blank "shells" that allow teachers to design their own tasks.

Here are several samples:

Argumentation Task Template

After researching _____ (informational texts) on _____ (content topic or issue), write a/an _____ (essay or substitute) that argues your position on _____ (topic, issue, essential question). Support your position with evidence from research. Be sure to acknowledge competing views. Give examples from from past or current events issues to illustrate and clarify your position.

Social Studies Example:
After researching academic articles on **censorship**, write a/an **blog or editorial** that argues your position on **the use of filters the use of Internet filters by schools**. Support your position with evidence from research. Be sure to acknowledge competing views.

ELA Example:
What makes something something funny? After reading selections from **Mark Twain and Dave Barry**, write a **review** that **compares their their humor** and argues **which type of humor works for a contemporary audience and why**. Be sure to support your position with evidence from the texts.. Be sure to support your position with evidence from the texts.

Informational or Explanatory Task Template

[Insert question] After reading _____ (literature or informational texts), write a/an _____ (essay, report, article, or substitute) that defines and explains (term or concept). Support your discussion with evidence from the text(s). What _____ (conclusions or implications) can you draw?

Social Studies Example:
What did the authors of the American Constitution mean by "rights"? After reading the **Bill of Rights**, write an **essay** that defines **"rights"** and explains **"rights" as the authors use it in this foundational document**. Support your discussion with evidence from the text. What implications implications can you draw?

The Literacy Design Collaborative Task Templates
Science Task Samples

Funded through the Bill and Melinda Gates Foundation, the Literacy Design Collaborative (LDC) has developed a set of Modules designed to support the integration of the Common Core Standards (6-12) in English/ Language Arts with core content in Science and Technical areas. Each Module consists of a task and associated instructional procedures. The Tasks require students to read, analyze, and comprehend written materials and then write cogent explanations or arguments related to topics they are studying. A key feature of the LDC's work is a set of generic Task Templates -- fill-in-the-blank "shells" that allow teachers to design their own tasks. Here are several samples:

Informational or Explanatory Task Template

[Insert question] After reading _____ (informational texts), write a/an _____ (essay, report, article, or substitute) that defines and explains (term or concept). Support your discussion with evidence from the text(s). What _____ (conclusions or implications) can you draw?

After reading **various sources on the issue of water contamination**, write a (**report, article**) that explains the causes and the effects of contamination. What conclusion or implications can you draw? **Cite at least four sources, pointing out key elements from each source**. Include a bibliography of your sources. Support your discussion with evidence from the text. What implications implications can you draw? (Informational or Explanatory/Synthesis)

How can energy be changed from one form into another? After reading **scientific sources on energy transformation**, write a report that examines the **causes of energy transformation and explains the effects when energy is transformed**. What conclusions or implications can you draw? Support yourdiscussion with evidence from the texts. (Informational or Explanatory/Cause-Effect)

Argumentation Task Template

After researching _____ (informational texts) on _____ (content topic or issue), write a/an _____ (essay or substitute) that argues your position on _____ (topic, issue, essential question). Support your position with evidence from research. Be sure to acknowledge competing views. Give examples from from past or current events issues to illustrate and clarify your position.

After researching **technical and academic articles on the use of pesticides in agriculture**, write a (**speech, blog, podcast, letter to editor**) that argues your position, pro or con, on the use of pesticides in managing crop production. Support your position with evidence from your research. L2 Be sure to examine competing views. (Argumentation/Analysis)

After researching **scientific and technical sources on methods for preventing water shortages, write a proposal in which you identify a problem faced by communities in arid regions and argue for a solution to improve water availability**. Support your position with evidence from your research. Be sure to examine a competing view challenging your solution. Give an example from past or current events to illustrate and clarify your position. (Argumentation/Problem-Solution)

Professional and Collaboration Time (PACT)

Charge:

We will use PACT to collaborate within various "Learning Communities" to grow professionally, and to collaborate together to enhance our planning, teaching and assessment with **a focus on student learning**. *PACT is not intended for departmental or team "housekeeping" or for individual teacher planning.*

Goals:

To improve curriculum quality and alignment
To analyze "results" and student work
To enhance instructional and assessement practices
To increase professional conversations between ASD faculty members
To better implement school improvement initiatives through collaboration

Schedule:

- Tuesday 1:10 – 3:10 (1:10 – 2:10 = horizontal teams, 2:10 – 3:10 = vertical teams if needed)

Suggestions of collaborative tasks:

– looking at student work
– analyzing data to improve student learning (e.g., NWEA scores, AP results, etc)
– evaluating and refining the quality of assessment tasks & rubrics
– planning among teachers who teach common courses
– coordinating among grade level teams (e.g., vertical alignment of curriculum)
– developing common assessments/rubrics (including moderation of assessments)
– planning for integration of units
– reviewing UbD Units and Atlas Rubicon Curriculum Maps
– discussing professional readings
– planning for implementation of new school/team programs
– participating in professional development

Questions To Ask When Examining Student Work

Use the following questions to guide the examination of student work.

Describe

- *What knowledge and skills are assessed?*
- *What kinds of thinking are required (e.g., recall, interpretation, evaluation)?*
- *Are these the results I (we) expected? Why or why not?*
- *In what areas did the student(s) perform best?*
- *What weaknesses are evident?* • *What misconceptions are revealed?*
- *Are there any surprises?* • *What anomalies exist?*
- *Is there evidence of improvement or decline? If so, what caused the changes?*

Evaluate

- *By what criteria am I (are we) evaluating student work?*
- *Are these the most important criteria?*
- *How good is "good enough" (i.e., the performance standard)?*

Interpret

- *What does this work reveal about student learning and performance?*
- *What patterns are evident?*
- *What questions does this work raise?*
- *Is this work consistent with other achievement data?*
- *Are there different possible explanations for these results?*

Identify Improvement Actions

- *What teacher action(s) are needed to improve learning and performance?*
- *What student action(s) are needed to improve learning and performance?*
- *What systemic action(s) at the school/district level are needed to improve learning and performance (e.g., changes in curriculum, schedule, grouping)?*
- *Other: _____?*

GRADE 9

ANNOTED EXEMPLAR
Persuasive

School is meant to be a place of learning, an opportunity to acquire knowledge and insight, and it was at Greece Olympia High School that I learned this lesson. It was one of those rainy day mornings when little could be heard above the squeak of wet rubber soles against the tile floor of the freshman hallway. I was heading into homeroom early; I thought I'd be the first to arrive. However, just as I was about to enter the room, I saw that a girl with vibrant brown hair, jeans, and a pink sweater had already gone into the room. Seemingly because her shoes had no texture, with a bottom as smooth as the complexion of her youth, she slipped, hung in the air for a moment, then crashed to the ground. I took a step backward to laugh out in the hall. When I peered back in the room, I expected that after such a fall she would be unable to move. However, she had already leapt to her feet. That's when I noticed her fervent glances. Left and right. Left then right. Her head quickly turned. Satisfied in her anonymity, she slowly, and I believe painfully, walked to her seat.

At that moment, I became consciously aware that people, including myself, seem to concern themselves more with the opinions and wants of others than with what they themselves think or desire. This girl had been so worried about what someone else might think that she didn't even stop to catch her breath. It's no wonder that a phrase like, "What will the neighbors think?" sounds cliché. For years people have been interested in owning a better house, buying a faster car and having a more attractive mate. Yet, are these things going to bring self-fulfillment? Is somehow having these items going to impress people, and, if so, why do we care what these people think? We are raised to do just that. From a young age, we are taught to please mostly our parents, then our teachers, coaches, and friends. From the moment we are born, others expect us to behave, think, and value in a certain way, and being the impressionable youths that we

The writer engages the reader by establishing a context and using an appropriate tone

The writer's use of imagery helps to create a context for the reader.

The writer utilizes vivid and precise language.

The writer varies sentence patterns for effect.

The writer chooses and employs specific rhetorical devices to support assertions and strengthen persuasiveness of the argument (anecdote) based on the topic, audience and purpose.

The writer uses effective interpretation that offers insights.

Data-Driven Improvement Planning

Based on an analysis of achievement data and student work:

- What *patterns* of weakness are noted?
- What *specific* areas are most in need of improvement?

- problem solving and mathematical reasoning are generally weak
- students do not effectively explain their reasoning and their use of strategies
- appropriate mathematical language is not always used
-

What *specific* improvement actions will we take?

- ☐ Increase our use of "non routine" problems that require mathematical reasoning.
- ☐ Explicitly teach (and regularly review) specific problem solving strategies.
- ☐ Develop a poster of problem solving strategies and post in each math classroom.
- ☐ Increase use of "think alouds" (by teacher & students) to model mathematical reasoning.
- ☐ Develop a "word wall" of key mathematical terms and use the terms regularly.
- ☐ Revise our problem solving rubric to emphasize explanation & use of mathematical language.