ALBEMARLE COUNTY PUBLIC SCHOOLS

Framework for Quality Learning:

Rigorous and Relevant Curriculum, Balanced Assessment, and Engaging Instruction

Establishing a community of
learners and learning, through rigor, relevance,
and relationships, one student at a time.

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Framework for Quality Learning:
A System Model for High-Quality Teaching and Learning

So What?
An Introduction to the Framework for Quality Learning

The Albemarle County Public Schools' core purpose is to establish a community of learners and learning, through rigor, relevance, and relationships one student at a time. The Framework for Quality Learning guides and supports teachers' development and implementation of a system for high-quality curricula, assessment, and instruction as they act on this vision and facilitate all students attaining deep understanding of the disciplines.

Standards-based and concept-centered, the Framework for Quality Learning is rooted in Albemarle County Public Schools' Lifelong-Learner Standards, Virginia's Standards of Learning (SOL), and national standards within the disciplines. These various standards provide insight into what all students must know, understand, and be able to do in real-life contexts. By organizing standards around key concepts and understandings of the discipline, we engage the personal intellect and emotions of the students (Erickson, 2002). When students explore concepts over time as opposed to facts in isolation, they develop deeper understanding and are able to transfer knowledge across disciplines and situations.

The Framework for Quality Learning sets rigorous expectations for how students learn, analyze information, and communicate, leading to increased student engagement, content mastery, and higher-order thinking (Figure 1). Application of the Framework for Quality Learning advances the Division's vision:

 "*All learners believe in their power to embrace learning, to excel, and to own their future.*"
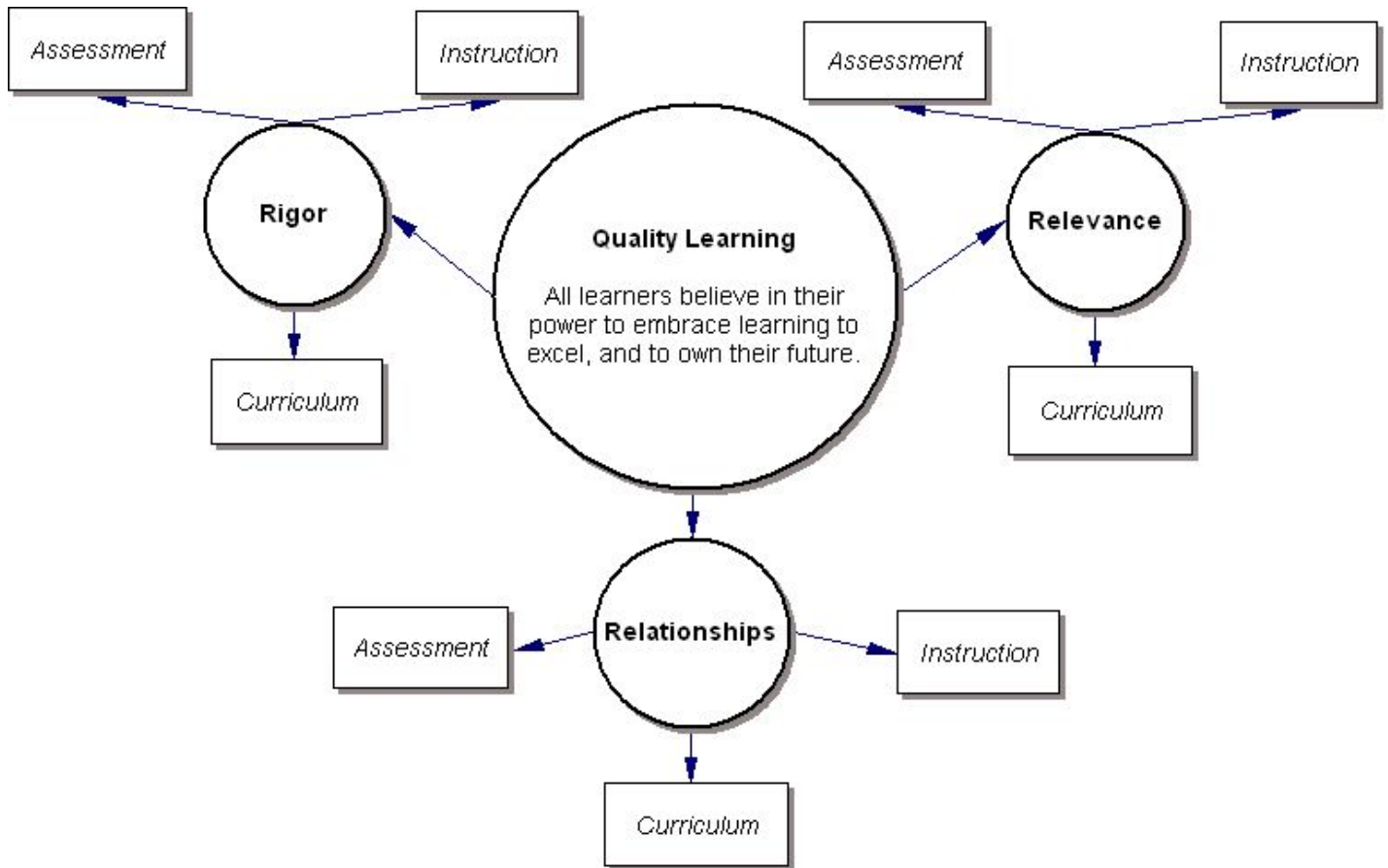
Figure 1. Applying rigor, relevance, and relationships within curriculum, assessment, and instruction.

The Framework for Quality Learning incorporates best practices in teaching and learning as summarized by the National Research Council in How People Learn: Brain, Mind, Experience, and School (2002). The council found that student achievement increases when the following occur:

1. Teachers determine and work with preexisting student knowledge and misconceptions.
2. Students reflect on their learning.
3. Classrooms are learner centered.
4. Teachers teach for understanding rather than coverage.
5. Teachers use assessment to inform instruction.
6. Teachers consider what is taught, why it is taught, and how mastery looks.
7. Schools and classrooms become communities of learners.

How the Framework for Quality Learning is Organized

The Framework for Quality Learning utilizes a backward design philosophy as articulated by Grant Wiggins and Jay McTighe in <u>Understanding By Design</u> (1998). Given this, the Framework for Quality Learning is organized around Curriculum, Assessment, and Instruction.

The Division's curriculum acts as the foundation on which teachers ultimately build experiences that facilitate student learning. The curriculum component of the Framework for Quality Learning is divided into five main parts: concepts; enduring understandings; essential questions; curriculum mapping; and, the unit planning framework.

Assessment, at its pinnacle, serves as a means of accountability as well as a tool for promoting mastery learning and student engagement. In this way, both assessment *for* learning and assessment *of* learning combine to create a balanced assessment system. The assessment component of the Framework for Quality Learning is divided into five main parts: assessment *of* learning vs assessment *for* learning; identifying clear targets and using Bloom's Taxonomy of the Cognitive Domain; assessment methods and assessment development; rubric analysis and feedback; and, student involvement in assessment.

Curriculum and balanced assessment are prerequisites for the development of instructional plans, which serve as itineraries for learning. It is only after teachers are clear on what it is that they expect all students to learn and what they will accept as evidence of learning that they begin developing learning plans.

The instruction component is organized into five main parts: disciplined inquiry; scaffolding for student learning; grouping strategies; other teacher decisions when planning for learning; and, using the learning plan format.

How to Use this Document

This work is intended to compel action. As such, readers are learners with this document as content presented in one section elicits questions in another. Just as concepts spiral throughout the K-12 curricula to provide multiple and increasingly complex opportunities for students to interact with those concepts, readers should expect to interact with the sections of this document multiple times to deepen understanding, thus mimicking the recursive nature of teaching and learning.

Lifelong-Learner Standards

The Division has identified 12 Lifelong-Learner Standards (Table 1) that set expectations for how students develop a wide variety of knowledge, understanding, and skills. The Lifelong-Learner Standards serve as a guide for teachers as they develop units, lessons, and tasks. These standards articulate the necessary components of lifelong learning that allow all students to succeed as members of a global community and in a global economy. The Lifelong-Learner Standards are overarching process-based standards, not discrete fact-based standards that can be addressed in a single lesson or even a single unit. These standards demand attention over time and across all disciplines.

Lifelong learning places emphasis on results (learning and doing), not focusing on efforts alone (teaching and receiving). To develop the skills and habits associated with lifelong learning, students must:

- learn beyond the simple recall of facts;
- understand the connections to and implications of what they learn;
- retain what they learn; and,
- be able to apply what they learn in new contexts.

Lifelong-Learner Standards
1. Plan and conduct research;
2. Gather, organize, and analyze data, evaluate processes and products; and draw conclusions;
3. Think analytically, critically, and creatively to pursue new ideas, acquire new knowledge, and make decisions;
4. Understand and apply principles of logic and reasoning; develop, evaluate, and defend arguments;
5. Seek, recognize and understand systems, patterns, themes, and interactions;
6. Apply and adapt a variety of appropriate strategies to solve new and increasingly complex problems;
7. Acquire and use precise language to clearly communicate ideas, knowledge, and processes;
8. Explore and express ideas and opinions using multiple media, the arts, and technology;
9. Demonstrate ethical behavior and respect for diversity through daily actions and decision making;
10. Participate fully in civic life, and act on democratic ideals within the context of community and global interdependence;
11. Understand and follow a physically active lifestyle that promotes good health and wellness; and,
12. Apply habits of mind and metacognitive strategies to plan, monitor, and evaluate one's own work.

Table 1. Lifelong-Learner Standards

County Lifelong-Learner Standards (LLLS) apply across all disciplines, and therefore, must be interpreted within each discipline according to how students learn, think about and "do" history, science, mathematics, etc. Interpreting the Lifelong-Learner Standards within the disciplines elevates student learning to the very highest levels of performance necessary for scholarship. Table 2 provides examples of how a single Lifelong-Learner Standard connects to specific content areas.

LLLS: Gather, organize and analyze data; evaluate processes and products; and draw conclusions.		
History	**Mathematics**	**World Languages**
The process of historical inquiry includes the following steps: Identify central question(s) in the history narrative; read with imagination and utilize visual data, literary, art and musical sources; consider & evidence multiple perspectives; compare and contrast differing sets of ideas, values, personalities, behaviors and institutions; differentiate fact and opinion; analyze cause-effect relationships; hypothesize the influence of the past and defend one's argument (s.)	In mathematics, all students should be able to: formulate questions that can be addressed with data; collect, organize and display relevant data to answer them; select and use appropriate statistical methods to analyze data; develop and evaluate inferences and predictions that are based on data; and understand and apply basic concepts of probability.	Language and culture are interdependent when learning a new linguistic system. In addition to analyzing volume, pitch, speed and tone of voice, students must observe and analyze how eye contact, facial expression and gestures play a vital role in enhancing the understanding of the message being conveyed and/or emotions being expressed.

Table 2: LLLS Across Multiple Disciplines

Teaching for lifelong learning requires educators to provide consistent opportunities for students to work at all levels of Bloom's Taxonomy: knowledge, comprehension, application, analysis, synthesis, and evaluation. Students move along this taxonomy of skills in a recursive manner, improving student engagement, content mastery, and higher-order thinking within each subject area, and reinforcing skills across all subject areas.

When students have the opportunity to practice and apply Lifelong-Learner Standards over time and in multiple contexts, they develop skills and attitudes necessary to succeed as members of a global community and in a global economy.

Habits of Mind

As John Dewey wrote, the most important role of school is learning. And learning is a consequence of thinking. Today's society demands trained and agile thinkers, and today's students must learn to make meaning for themselves and to solve problems for which they do not have answers. (Costa, 1997)

Educators Benjamin Bloom, Arthur Costa, and Reuven Feuerstein suggest that high quality thinking is characterized by the following habits of mind which transfer across content areas: intentionality, persistence, precision, open-mindedness, deliberation, seeking and giving reasons and evidence, objectivity, willingness to change positions when evidence and reason warrant doing so, a desire to be well informed, judging in terms of situations, issues, purposes and consequences. (Beyer, 1997)

In addition to these general habits of mind, each discipline has its "way of thinking" or making meaning from subject-specific content. Listings of discipline-specific habits of mind are included in Appendix A. The teacher's goal is to help students become disciplined thinkers as they move from grade level to grade level.

Curriculum

The Division's curriculum acts as the foundation on which teachers ultimately build experiences that facilitate student learning. The curriculum component of the Framework for Quality Learning is divided into five main parts: concepts; enduring understandings; essential questions; curriculum mapping; and, the unit planning framework.

Questions to Consider
- What should all students know, understand, and be able to do?
- What knowledge is truly essential and enduring?
- What's worth understanding?
- How can the curriculum we bring to our students engage them in meaningful questioning about the world?
- What is the role of curriculum in eliminating the achievement gaps?

Moving Learning Beyond the SOL

The Virginia Standards of Learning (SOL) may or may not represent what is most important for students to know, understand, and be able to do in any given subject at any given grade level. Teachers use higher-order thinking when they analyze and evaluate grade-level standards to identify the most import concepts and skills and articulate these clearly as what students are expected to know, understand, and be able to do. They synthesize and use professional judgment when they map these grade-level concepts to discipline level concepts that represent what is most important in the discipline and to the Lifelong-Learner Standards.

What teachers know about teaching, learning, their students and their content and the decisions they make on a daily basis are the greatest factors in determining how well students learn and to what extent that learning occurs. When teachers work in collaboration through structures and systems indicative of a Professional Learning Community, teachers are more likely to engage in authentic professional learning, resulting in higher levels of learning for all students. Collaborative inquiry, analysis, and reflection are central to quality professional learning among Albemarle County educators.

Implementation of the Framework for Quality Learning will only occur through the commitment of all educators to professional growth that produces deep understanding, transforms mental models, and produces a continuous stream of goal-focused actions (Dennis Sparks, 2004).

Enduring Understandings

Enduring understandings sharpen the focus of a unit for both the educator and the student, stating clearly what is to be learned rather than simply identifying the area or topic of inquiry, resulting in a deeper level of understanding (Wiggins & McTighe, 1998). Enduring understandings are broad generalizations that connect concepts. They are typically written in a statement that shows the relationship between two or more concepts using powerful and active verbs that paint a picture and motivate students. As enduring understandings are timeless, they are revisited throughout one's life with increasing sophistication as the individual deepens understanding and builds connections across concepts. Enduring Understands within each discipline are provided in Appendix A.

Essential Questions

Essential questions are open-ended questions that stem from enduring understandings, spiraling throughout the curriculum and moving forward into adulthood. Essential questions motivate and challenge students to explore and construct new meanings by synthesizing and evaluating new information.

Language Arts Example

Interdisciplinary Concepts: Change and Continuity
Language Arts Concept: Cultural Context

Enduring Understandings

- Language is dynamic – multiple factors affect the evolution of language.
- Change and continuity in language and literature reflect individual and societal evolution.

Essential Understandings

- An author's cultural context affects his or her perspective and, thus, his or her writing.
- An author's frame of reference influences his or her message.
- A reader's or listener's experiences affect understanding and enjoyment.
- Understanding historical and cultural context enhances and emphasizes meaning.

Essential Questions

- How is an author's cultural context reflected in his/her writing?
- How does an author demonstrate bias?
- Why is an author's cultural context important?
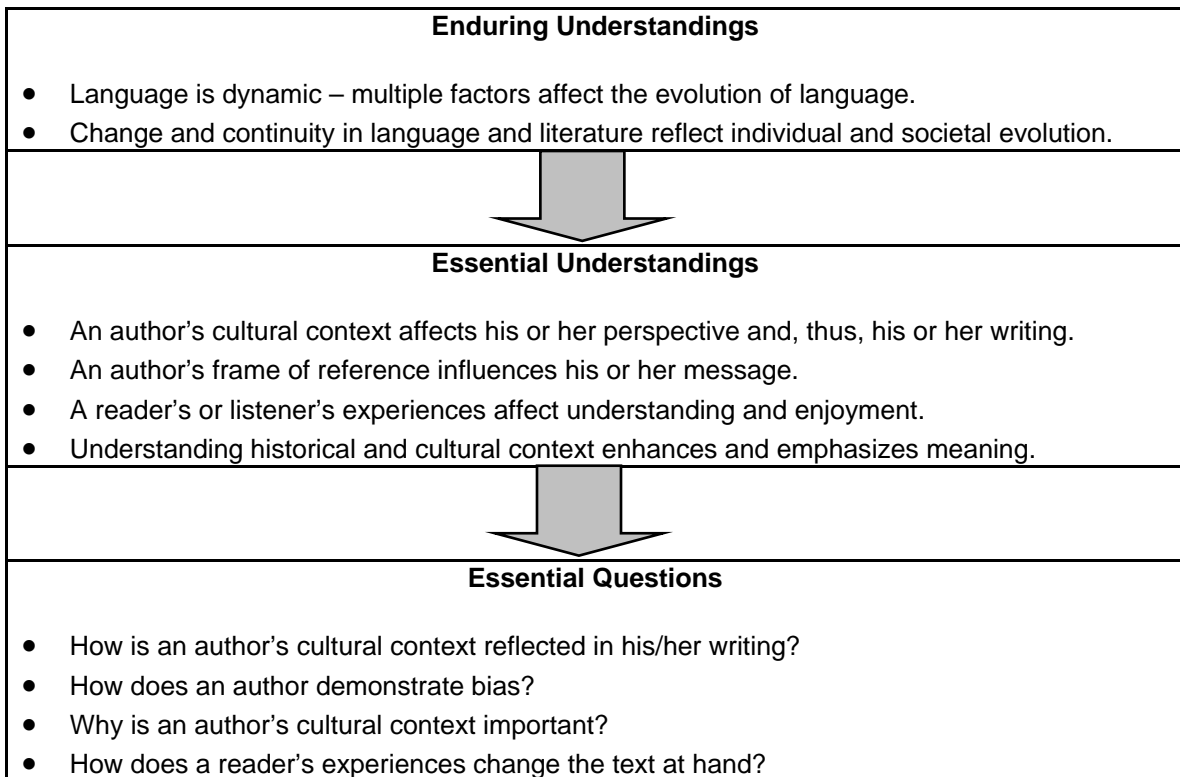- How does a reader's experiences change the text at hand?

Figure 2.

How do teachers plan using concept-based thinking and backward design strategies?

What teachers might have at the table while planning with colleagues:

- the Framework for Quality Learning,
- the Division Curriculum Framework for the discipline,
- the Virginia Standards of Learning Curriculum Framework for the discipline – both grade level and cross-grade level,
- other disciplines' Curriculum Frameworks and SOL that might set up interdisciplinary learning opportunities
- the SOL Scope and Sequence for the discipline, and
relevant assessment data.

Thinking through selecting a conceptual lens:

A conceptual lens provides a way to look at the information, much like using a filter in photography. It doesn't change the pieces of the picture, but it does affect how they look. Begin with what students need to know, understand, and be able to do. Consult various standards and frameworks. Consider relevant data, particularly pre-assessments. This could be a "jumping off" point that minimizes under teaching or beginning instruction without adequate background knowledge. Then select a conceptual lens that will maximize deep understanding throughout the course of the school year and a student's K-12 school experience.

A "think aloud" example from a Language Arts/English teacher:

So, if I were to plan a unit starting with several of Poe's short stories, I need to consider, in relation to other units I will teach throughout the year, the lens through which students will study those short stories. If I select a thematic approach, I might have students read and discuss short stories with a central theme of fear of the unknown. I might structure their study around their personal fears of the unknown. I could then relate these stories to a larger work or other short works with the same theme. In this way, students would look at fear of the unknown as a universal experience.

Or I could choose a conceptual lens of author's craft. Although students would still discuss the central themes, we would spend more time analyzing Poe's use of sentence structure, vocabulary, figurative language, and such to determine how he brings a story to life. We could compare Poe's craft with that of other authors we have studied. Students could write emulating Poe's style and syntax, which would also bring in the lens of aesthetics.

No matter which conceptual lens is selected, the others are still relevant and should be explored as appropriate. Selecting a conceptual lens does not mean ignoring the others; it means elevating one to use it as a filter for studying a topic. Figure 2 illustrates how the enduring understandings, essential understandings, and essential questions may connect for a specific unit.

Components of Concept-Centered Learning

Units, themes, and topics are organized around concepts. From these concepts, understandings are developed and connected to essential questions. Concept-centered learning enables students to make connections to prior knowledge and lays a solid foundation for future learning. Concept-centered learning promotes contextual development of knowledge and skills, therefore increasing the likelihood of both mastery and retention.

Concepts

To ensure that all students have access to a guaranteed and viable curriculum, the Framework for Quality Learning contains organizing concepts from which enduring understandings are derived. These concepts have been identified by national organizations including the National Council of Teachers of Mathematics, American Association for the Advancement of Science, National Council for History Education, National Council of the Social Studies, International Reading Association, National Council of Teachers of English, and the College Board. Organizing curriculum around concepts establishes a common thread as curriculum spirals with increasing complexity from kindergarten through grade twelve, providing students with scaffolding needed to reach the next level of achievement. Working at the conceptual level helps students make connections within and across the disciplines. See Appendix A for interdisciplinary and discipline-level concepts. A language arts unit, Coming of Age, might be grounded in the interdisciplinary concept of change and continuity, examining the significance of understanding cultural context as it relates to reading and writing. This concept might lead to the enduring understanding that *change and continuity in language and literature reflect individual and societal evolution.* (Figure 2).

Unit Planning Framework

The Unit Plan Framework, modified from the work of Wiggins and McTighe (1998) and Erickson (2002), addresses the curricular needs of Albemarle County. At this level of the Framework, curriculum directly impacts students. For this reason, the Unit Planning Framework is designed to help unit developers ensure that instruction and assessment are aligned with enduring understandings and essential questions - a backward design process.

The first component of the Unit Plan Framework includes basic identifying information including grade level, discipline/topic area(s), and unit designer(s) (Figure 3).

Albemarle County Public Schools
Curriculum Unit Framework

Unit Title: _____   Grade Level: _____

Discipline/Topic Area(s):_____

Unit Designer(s): _____   Time Frame: _____

Figure 3. Identifying Information

A unit summary exists so unit developers may provide readers with a brief abstract of the unit, to be written at the end of development (Figure 4).

Unit Summary

Figure 4. Unit Summary

The Unit Plan Framework includes a concept map to provide teachers and students with an advance organizer of the concept and enduring understandings of the unit. Unit developers should also identify the Lifelong-Learner Standards and habits of mind that will be addressed in the unit (Figure 5).
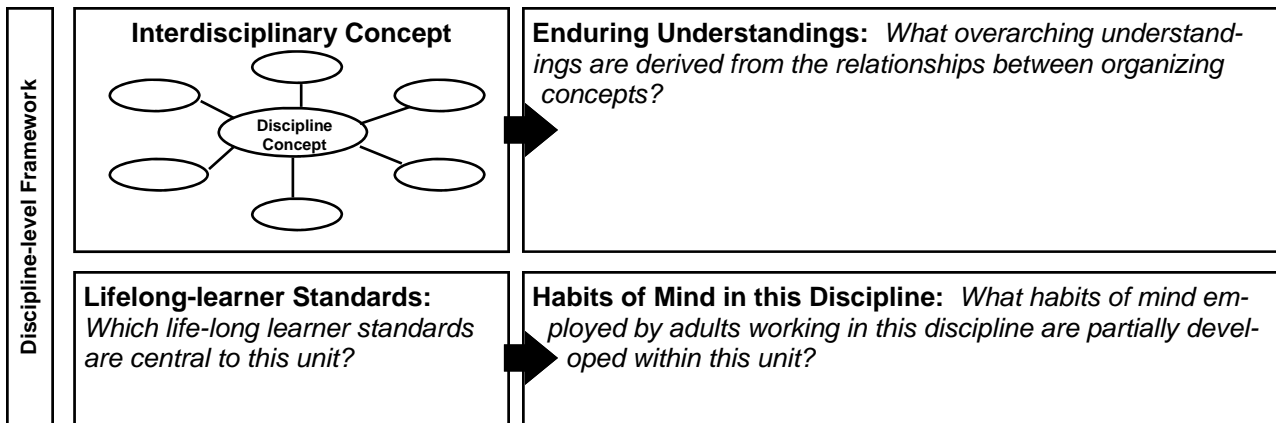

Figure 3. Discipline-level Framework

According to Wiggins and McTighe (1998), curriculum that strives for student understanding requires uncoverage. Through identifying the content standards, essential understandings, essential questions, and essential knowledge, skills, and vocabulary of the unit, unit developers uncover the material to be learned. Essential understandings sharpen the focus of the enduring understanding relevant to the topic.

Teachers should articulate the essential understandings and questions of the unit, the glue that holds the content together, before designing assessments and teaching and learning strategies, which must support these bigger ideas. In addition, rather than attempting to create fully integrated units, developers identify natural connections to other disciplines at the beginning of planning so classroom teachers may help students make these connections during the teaching and learning process (Figure 4).

Grade-level Framework

Content Standards: *Which SOL or discipline standards are central to this unit?*	**Essential Questions:** *What essential questions will focus this unit? What essential questions will drive inquiry and understanding within this unit?*

Interdisciplinary Connections: *What are the natural connections to other disciplines in this unit?*

Pre-Assessment(s): *What pre-assessment(s) and rubrics that define quality will be used to determine students' prior knowledge and/or misconceptions related to the essential knowledge, understanding, skills, and vocabulary in this unit? How will pre-assessment data be used to inform instruction?*

Essential Knowledge, Understanding, Skills, and Vocabulary

Students will know: *What ideas, concepts, information, and facts will students be able to recall or recite?*

Students will understand: *What ideas, concepts, information, and facts will students be able to explain, interpret, manipulate or apply in new situations?*

Students will be able to: *What skills will students demonstrate?*

Vocabulary: *What terms must students know and use?*

Summative Assessment(s): *What summative assessment(s) and scoring guides will be used to determine if students have mastered the essential knowledge, understanding, skills, and vocabulary in this unit? At what levels of Bloom's Taxonomy will students demonstrate mastery?*

Figure 4. Grade-level Framework
Sources: Adapted from Erickson, 2002; Wiggins & McTighe, 1998; McMillan, 2001.

As teachers use a backwards design approach to planning, they begin by articulating what it is all students will know, understand, and be able to do as a result of learning in the context of the lesson or unit. Once "the end" becomes more clear, teachers begin thinking about what constitutes evidence of student learning. Thinking about assessment inevitably causes teachers to re-think curriculum, thus beginning a recursive cycle in planning for student learning.

Curriculum Mapping for Concept-Centered Learning

Mapping the year is a necessary starting point to connect all planned units. Curriculum mapping provides a framework for educators to ensure the educational experiences of individual students result in a quality education related to performance standards for each student (Kallick, 2004). This process can be a powerful tool for teachers working within a professional learning community as they attempt to collectively address the following questions:

- *What is taught?* What do we want each student to learn? What concepts and understandings are key for all students? Which units/skills are most powerful for lifelong learning? What information is necessary for students to access what the next grade or unit has to offer?
- *How is learning assessed?* How will we know each student has learned it?
- *How is it taught?* What learning contexts will be provided for all students? How will we respond when students experience difficulty in learning? How will we respond when students already know what we are about to teach?
- *When is it taught?* What will determine the order in which I teach these units/skills? What can I combine?

Another question to consider is that of applying a concept to the entire year. For example, would it benefit students to look at each unit through an overall study of change and continuity? Using an overarching lens, teachers plan units and other concepts to layer into that larger idea.

Curriculum mapping that reflects implementation of the Framework for Quality Learning includes identifying at least concepts and understandings that will be addressed over the course of the year. Curriculum mapping that reflects implementation of our Professional Learning Community model includes identifying specific learning targets, assessments, and intervention strategies. Working to develop yearlong maps that include these components and using data collected and strategies employed within the context of a professional learning community to adjust the curriculum maps throughout the year is innovative practice as described within Albemarle County's Teacher Performance Appraisal system.

A "think aloud" mapping example from a Language Arts/English teacher:

If I plan this way, I might choose to study The Adventures of Tom Sawyer, Devil's Arithmetic, and Star Girl *for the overarching theme of coming of age and have students analyze the similarities and differences in the coming of age experiences of the main characters. So we would study the universal experience through these texts while also applying an overarching concept of change and continuity. How has coming of age changed since the 1800s? What rites of passage appear to withstand changes in time and culture?*

In this way, the concepts, not the texts, become the central component of study. The texts become the vehicles to understanding the bigger ideas. Planning conceptually requires a paradigm shift from teaching discrete skills, texts, or units to a much larger picture of how concepts tie the discrete pieces together. Think of the concepts as folders in which kids store information – how many rich experiences will the teacher set up to (1) fill those folders, (2) arrange and rearrange that knowledge, and (3) challenge and apply that knowledge in novel ways?

Balanced Assessment

Balanced assessment systems provide accurate and timely information about student achievement and learning to individual students, teachers, school and district administrators, as well as, local, state, and federal policymakers. More importantly, they encourage and support learning by helping students and teachers see that their continued efforts will result in success. Because they balance high quality periodic standardized tests with accurate day-to-day classroom assessments, balanced assessment systems, coupled with quality curriculum and instruction decisions, actually promote student learning. The assessment component of the Framework for Quality Learning is divided into five main parts: assessment *of* learning vs assessment *for* learning; identifying clear targets and using Bloom's Taxonomy; assessment methods and assessment development; rubric analysis and feedback; and, student involvement in assessment.

Questions to Consider
- How can assessment support learning?
- How can assessment tasks and performances engage students in thinking and working beyond the SOL?
- What assessment strategies are best suited to certain content and skills?
- How can feedback improve future performances?

In order for us to increase student learning and achievement, assessment is used as an instructional tool while learning takes place. It is an accountability tool used to determine if learning has occurred. Both purposes of assessment create an important balance toward understanding student learning.

Four key questions inform the construction of quality assessments:

Why Assess? (What's the purpose and who will use the results?)

Assess What? (What are the learning targets? Are they clear? Are they good?)

Assess How? (What method? Sampled how? Avoid bias how? Written well?)

Communicate/Provide Feedback How? (How do we manage the information? How do we report?)

For additional information on balanced assessment please read the article, *Balanced Assessment: The Key to Accountability and Improved Student L earning.* This article can be found online: http://www.nea.org/accountability/images/balanced.pdf.

Why Assess?

Assessment *of* Learning vs. Assessment *for* Learning

Teachers who understand the multiple purposes of assessment recognize the need for a balance of assessments. Report card grades and SOL tests are examples of assessment *of* learning and allow students, teachers, school administrators, and policymakers to make inferences regarding the extent to which students have learned the intended curriculum. Assessment *of* learning is also called "summative" assessment. While assessments *of* learning do provide valuable information regarding a student's cumulative level of competence, they fail to provide the day-to-day contextual information that informs teaching and learning.

When teachers assess for learning, they build a continuous stream of information. These assessments are used throughout instruction describe students' needs, plan or adjust interventions, provide students with feedback to facilitate learning, and help students monitor their learning. When assessment is used *for* learning, teachers provide ***descriptive*** rather than evaluative feedback with students. Assessment *for* learning ***engages*** students in on-going self-assessment. Assessment *for* learning involves interaction between the teacher and the student.

Assessment *for* learning is student-involved formative assessment in which both students and teachers play active roles:

Students: | **Where am I going?**
Teachers: | help students identify clear learning target(s), provide examples and models of strong and weak work to help students identify what elements are evident in order to clarify expectations

Students: | **Where am I now?**
Teachers: | offer regular and descriptive feedback, help students self-assess and set goals

Students: | **How can I close the gap?**
Teachers: | design lessons to focus on one aspect of quality at a time, teach students focused revision, engage students in self-reflection, and let them keep track of and share their learning

Adapted from Stiggins, 2004.

Assess What?

Identifying clear targets and using Bloom's Taxonomy of the Cognitive Domain

Teachers identify intended learning targets. Once we have identified those targets, we are better able to plan meaningful assessments that reflect exactly what we will teach and what we want students to learn. These assessments are used to disaggregate valuable information about student progress and achievement.

Teachers categorize tasks within learning targets according to the types of student performances required. Bloom's Taxonomy of the Cognitive Domain helps teachers understand the level of challenge presented by different learning targets, tasks, and performances. Mastery of content and skills requires students to perform at all levels, not just the "low" or "high" ones.

Bloom's Taxonomy of the Cognitive Domain

Knowledge – students recall information; students exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers.
> **Example verbs** – define, memorize, repeat, record, list, recall, name, relate, collect, label, specify, cite, enumerate, tell, recount

Comprehension – students recognize what they know in context; students identify relationships between pieces of information; students demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas.
> **Example verbs** – restate, summarize, discuss, describe, recognize, explain, express, identify, locate, report, retell, review, translate

Application – students use what they know and comprehend in the performance of a skill; students solve problems to new situations by using acquired knowledge, facts, techniques, and rules in new ways.
> **Example verbs**—exhibit, solve, interview, simulate, apply, employ, use, demonstrate, dramatize, practice, illustrate, operate, calculate, show, experiment

Analysis – students draw conclusions from new data, making interpretations based on familiar patterns in what they know and comprehend; students examine and break information into parts by identifying motives or causes; students make inferences and find evidence to support generalizations.
> **Example verbs**—interpret, classify, analyze, arrange, differentiate, group, compare, organize, contrast, examine, scrutinize, survey, categorize, dissect, probe, inventory, investigate, question, discover, text, inquire, distinguish, detect, diagram

Synthesis – students create a new work that demonstrates their ability to apply their knowledge, comprehension, and analysis of information in a student-generated product; students compile information together in a different way by combining elements in a new pattern or proposing alternative solutions based on the application of knowledge and understanding.

> **Example verbs** – compose, setup, plan, prepare, propose, imagine, produce, hypothesize, invent, incorporate, develop, generalize, design, originate, formulate, predict, arrange, contrive, assemble, concoct, construct, systematize, create

Evaluate – students develop, argue and defend opinions based on what they know and comprehend after making an analysis; students present and defend opinions by making judgments about information; students validate ideas or quality of work based on a set of criteria.

> **Example verbs** – judge, assess, decide, measure, appraise, estimate, evaluate, infer, rate, deduce, compare, score, value, predict, revise, choose, conclude, recommend, select, determine, criticize

Table 3: Comparing and Contrasting Assessment *of* and *for* Learning

	Assessment *for* Learning	Assessment *of* Learning
Reasons for Assessing	Promote increases in achievement to help students meet more standards; support ongoing student growth; improvement	Document individual or group achievement or mastery of standards; measure achievement status at a point in time for purposes of reporting; accountability
Audience	Students about themselves	Others about students
Focus of Assessment	Specific achievement targets selected by teachers that enable students to build toward standards	Achievement standards for which schools, teachers, and students are held accountable
Place in Time	Process part of learning	An event after learning
Primary Users	Students teachers, parents	Policy makers, program planners, supervisors, teachers, students, parents
Typical Users	Provide students with insight to improve achievement; help teachers diagnose and respond to student needs; help parents see progress over time; help parents support learning	Certify student competence; sort students according to achievement; promotion and graduation decisions; grading
Teacher's Role	standards into classroom targets; inform students of targets; build assessments; provide feedback to students; adjust instruction based on results; involve students in assessment	Administer the test carefully to ensure accuracy and comparability of results; use results to help students meet standards; interpret results for parents; build assessments for report card grading
Student's Role	Self-assess and keep track of progress; contribute to setting goals; act on classroom assessment results to be able to do better next time	Study to meet standards; take the test; strive for the highest possible score; avoid failure
Primary Motivator	Belief that success in learning is achievable	Threat of punishment, promise of rewards
Examples	Using rubrics with student; student self-assessment; descriptive feedback to students	Achievement tests; final exams; placement tests; short cycle assessments

Adapted from Stiggins, 2004.

Below is an example of how teachers might identify a learning target, the task associated with it, and then create questions and activities from each of the different levels:

Objective: The student will write a compound sentence using conjunctions.
Knowledge
   1. What is a compound sentence?
   2. List the conjunctions that you could use to combine sentences into a compound sentence.
Comprehension
   1. What is the difference between a compound and a simple sentence?
   2. Create a compound sentence from two given simple sentences.
Application
   1. Write one example of a compound sentence.
   2. Use the conjunction "and" to form a compound sentence.
Analysis
   1. Identify reasons for using conjunctions to form compound sentences.
   2. Compare the three conjunctions "and", "or", and "but" and explain the differences among each.
Synthesis
1. Write a paragraph that uses each of the three conjunctions to form a compound sentence.
Evaluation
   1. Trade paragraphs with a partner and look for 3 compound sentences using "and", "or", and "but".
   2. Determine whether or not your partner understands writing with compound sentences and be prepared to defend your answers.

Putting it All Together – A Backward Design
During the initial planning of a unit, teachers identify enduring understandings, essential questions, and clear learning targets to be assessed throughout the unit. Included is an analysis of Bloom's Taxonomy of the Cognitive Domain to determine the levels of cognition required within the unit. Will students recall information, create new pieces of work, or perhaps do both? Which level of Bloom's Taxonomy of the Cognitive Domain best describes what students should know, understand, and be able to do as a result of instruction? During the initial stages of unit planning, teachers pay attention to both assessment design and acceptable evidence of achievement on the various assessments.

Assess How?

Assessment Methods and Assessment Development

Assessment Methods

Once the purpose of the assessment and the content to be assessed have been determined, teachers decide on formats or methods of assessment. The most appropriate assessment method(s) and scoring guides to assess students' level of mastery are selected based on the curricular and instructional characteristics of the content and skills to be assessed. A variety of assessment methods can be used to elicit different types of student learning. The table below (Table 4) provides a brief description and examples of different types of assessment methods.

Table 4: Example Assessment Methods

	Assessment Method			
	Selected Response Items	**Constructed Written Response Items**	**Performance Assessment**	**Personal Communication**
Brief Description	Items that require students to select from a list of possible responses.	Items that require students to respond by constructing or generating an answer.	Measure a student's mastery of a high-level skill (critical thinking or speaking fluently in French) through a complex authentic product or performance. Can be short term or long term projects	Oral or other interpersonal communication between teacher and student
Examples	Binary choice items (not just T/F), matching items, multiple choice items	Short answer, essay (compare pieces of literature, analyze artwork, interpret scientific data, solve mathematical problem and explain solution, describe in detail an economics principle.)	Extended written products (essays, lab reports), visual products (murals), oral performances (oral reports, foreign language dialogues), demonstrations (skill performances in PE) senior exhibitions, science projects	Oral assessment of a dysgraphic student, recitation of content, probing questions.
Most Appropriate Use	Assessing elements of knowledge and understanding of patterns of reasoning.	Assessing understanding of relationships among elements of knowledge, descriptions of complex problem solutions, and written products.	Assessing problem solving, performance skills and product creation.	Assessing reasoning using follow up questioning and oral communication.

In a balanced assessment system, students are involved in assessing, tracking, and setting goals for their learning. Students are provided with opportunities to reflect on their understanding both verbally and in writing through the use of reflective journals/logs and conversations with peers and teachers. Portfolios are used to aid in student self-assessment through student collection and communication about assessments. Authentic portfolios involve the student in collecting and evaluating ongoing work for the purpose of improving the skills needed to create such work. This process enables the student to become a reflective learner and involves students in metacognition which deepens their ability and desire to learn.

Teacher observations are used to inform and supplement all types of assessment. Informal and formal observations of student participation, interaction, and work inform instructional decisions.

Assessment Development

"None of the methods is inherently superior to any other, and all are viable if used well." (Stiggins et al, 2004)

For all types of assessments, teachers work through planning, developing, critiquing, administering, and revising the assessment (Stiggins et al, 2005). Thus assessment development is an active and reflective process before, during, and after an assessment is given. Constructing quality assessments involves different skills for different types of assessments. For example selected response assessments require the ability to develop clear items with discriminating distracters, while performance assessments require the ability to develop meaningful tasks and a rubric with clear performance ciriterea (see Popham's *Test Better Teach Better* or Stiggins' *Classroom Assessment For Learning* for detailed examples of quality assessment). Teachers who construct high quality assessments avoid (a) unclear directions, (b) ambiguous statements, (c) unintentional clues, (d) complex phrasing, and (d) difficult vocabulary (Popham, 2003).

Differentiated Assessment: Responsiveness to the Learner

"To make valid references about learning, teachers need to allow students to work to their strengths." (Tomlinson & McTighe, 2006)

While it is common practice to differentiate instruction, it is perhaps less common for teachers to consider how to differentiate assessment. Chapman and King (2005) propose that assessing students' dispositions is no less important than assessing their work. Tomlinson and McTighe (2006) discuss the ways that assessment can be responsive to the learner:
- Understanding our learners (assessing student dispositions)
- Providing options to show student learning (assessing student work)

Understanding our learners (assessing student dispositions)
There are several theories of learning styles which suggest that people have different ways in which they learn best. A few of these theories include: Howard Gardner's Multiple Intelligences, Anthony Gregorc's Mind Styles, and David Kolb's learning styles (see the links below for more information).

Gardner, Howard. "Multiple Intelligences." http://www.thomasarmstrong.com/
multiple_intelligences.htm.
Gregorc, Anthony. "Mind Styles." http://facultyweb.cortland.edu/andersmd/learning/
Gregorc.htm.
Kolb, David. "Learning Styles." http://www.businessballs.com/kolblearningstyles.htm.

The utilization of a tool to assess multiple learning styles helps the teacher understand how the student learns and also how the student shows learning best. Most importantly, the student begins to understand how she learns and how she shows her learning most effectively. Sensitivity to student modalities is critical not only in the arena of assessment; but also, in designing instructional activities.

Providing options to show student learning (assessing student work)

Tomlinson and McTighe (2006) state that assessment becomes responsive when the students are given options to adequately show their knowledge, skill, and understanding. The caveat is that the options available must provide requisite evidence based on the identified learning goals.

Santa (1988) devised a writing strategy to help students demonstrate their understanding of information. This strategy, known as RAFT (role, audience, format, topic), provides students with an organizer that informs their understanding of purposeful writing and point of view (see the following link for more information http://www.somers.k12.ny.us/intranet/
reading/RAFT.html.)

Many teachers have devised systems that allow students to demonstrate their understanding by using a product menu. Tomlinson and McTighe (2006) use a Tic-Tac-Toe card that allows for individual choice that appeals to student strength and interest (see Table 5). Choice cards are a strategy that allow a student to submit a proposal for an alternative form of evidence.

Table 5: Tic-Tac-Toe Card for Student Choice

Written	Visual	Oral
Research report	Poster	Lesson presentation
News article	Graphic organizer	Oral presentation
Information brochure	PowerPoint	Radio interview

Directions: Choose three boxes that form a tic-tac-toe now. Choose products that will help you demonstrate what you know and stretch your skills.

Tic-Tac-Toe menus provide students options regarding how they will demonstrate mastery.

Assessment Analysis, Communication, and Feedback

Item Analysis
Although time consuming, a detailed item analysis reveals helpful information about students as well as assessments. Strategies to analyze a selected response assessment are described below.

Selected Response Analysis
Number down a sheet of paper. After marking the assessment, tally every time a question is incorrectly answered. See Figure 5.

Figure 5: Example Item Analysis

Clearly more students missed questions 5, 8, and 11 than any other. This begs for further inquiry regarding the missed questions. Was the content addressed by items 5, 8, and 11 taught? If so, which students learned it? Were the skills and strategies required to answer items 5, 8, and 11 practiced? If so, who can apply them? Were the items, including distracters, constructed well? Were the items accessible to all students (format, language, etc.)? Which, if any, of these items require re-teaching? What clues do students responses provide in planning any necessary re-teaching?

Rubric Analysis

Also, teachers analyze results of a rubric based assessment across the class by tallying the results. Start with a blank rubric. After scoring all the assessments, flip through and tally each time a student is rated in that standard. Below is a sample rubric for a presentation (see Figure 6)

Figure 6: Rubric Analysis

Total _____ / 9	1	2	3
Presenter must speak in a loud and clear voice.	Presenter was unable to be heard or understood by the audience. III	Presenter was loud enough but not speaking very clearly. IIII III	Presented with a loud and clear voice. IIII
Presenter will make eye contact with the audience and use note cards only to stay on track.	Presenter read from note cards during the entire presentation. IIII IIII	Presenter gave some effort to make eye contact, but read off the note cards more often than not. III	Presenter made good eye contact and used the note cards only to stay on track. II
Presentation followed a logical order and was easy to understand.	Presentation had no logical order and had no main point.	Presentation was understood, but not in a logical order. IIII	Presentation was presented in a logical order and understood by the audience. IIII IIII I

Analysis: Students understand how to prepare a speech and deliver it in a logical order. Most students are reading from their note cards during the presentation. Finally, a teacher can infer that students are evenly split when it comes to using a clear speaking voice.

Using item analysis information
Technology can help teachers analyze assessments by performing extensive calculations instantly. Table 6 shows various calculations that can help the teachers extract information from an assessment that informs instruction.

Table 6: Calculations and Information Learned

Calculation	What it can tell you…
Class Average	Averaging the scores of the entire class provides very little information as it pertains to informing instruction. When compared across classes taking the same assessment, an average score can be used as a general indicator as to which class performed better.
Percent Correct by Question	Calculating the percentage of students that responded correctly to each individual question can help a teacher determine whether the whole class has reached an understanding of the content or if re-teaching is necessary. This should be followed by a review of individual student data to determine which students need to be retaught and which students are ready to move on.
Percentage of Each Answer Responded	Within each question calculate how many students answered each of the possible responses. For example, how many students answered A, answered B…etc. Writing quality distracters can help a teacher gain more insight on how students came up with the answer they chose.

Feedback

In order for student assessment information to improve curriculum, instruction, and student learning, accurate analysis of assessment results must be followed by feedback to the student and teacher. In *Classroom Instruction that Works,* Marzano (date) identified four generalizations to guide the effective use of feedback. Feedback that positively impacts student learning is:
- criterion-referenced
- related to specific knowledge and skills
- student-centered, student-involved
- timely with additional opportunities to perform

Feedback at the beginning, during, and at the end of the instructional process are all necessary to provide students the best learning opportunities.

Feedback at the Beginning of the Instructional Process

Information gained from pre-assessments, as well as diagnostic testing yields impressions of students' knowledge and skills related to the content. Information from this type of assessment establishes a starting point for the teachers. Teachers determine which studentsneed help acquiring essential skills and which students are ready for extended learning. Teachers ask themselves: Do the students have the prerequisites to plunge into the forthcoming unit of learning, or does time need to be spent on building a foundation or reviewing prior knowledge and skills? Do students already have a firm grasp of concepts and therefore need instruction that allows them to develop deeper understanding of the curriculum? While feedback from preassessments is used primarily to inform instruction, it can also be used to help students form detailed personal learning plans.

Timing of preassessments should be considered to assure accurate and meaningful feedback. The timing of a unit-level preassessment should be as close to the instruction as possible while also allowing the teacher enough time to monitor and adjust.

Feedback to the Student During the Instructional Process

The goal of feedback is to increase individual knowledge, skills, and achievement. For students to learn from their confusion or miscues, they must be aware of what they have accomplished as well as what they need to work on. Providing descriptive feedback, either in written or oral format, is followed by opportunities to practice and demonstrate understanding and skill.

Feedback to the Teacher During the Instructional Process

Assessment during instruction offers teachers an analysis of teaching strategies and methods. Is the instruction sound and effective? Is re-teaching for all or intervention for some students necessary? Asking these questions can help teachers determine whether more time using the same method of instruction is enough, or if the instructional method needs to be different.

The Dufour's Professional Learning Community structure provides teachers with contexts for analyzing common assessments. Every teacher on a team works together to identify the most important common essential outcomes. Common assessments are created to assess student performance against the common essential. After assessing, teachers share results and co-construct interpretations of these results. From the analysis they learn about successful practices and attempt to apply them in their practice. The Professional Learning Community conversations also inform student grouping practices and curriculum areas that require more or different attention.

<u>Feedback at the End of the Instructional Process</u>

Feedback at the end of instruction informs the student, parents, teacher, and school system how well the goals of instruction have been met. For the student, reporting of summative assessments ranges from a grade on a single assignment to earning a credit for a class. For the teacher, progress of the individual student as well as effectiveness of their teaching can be measured. Analysis of trends in student performance informs teachers as they ensure all students master a guaranteed and viable curriculum.

Student Involvement in Assessment

Student involvement in assessment is key to unlocking the potential of assessment as a learning tool. Below are questions to consider while planning to include students in assessing their learning.

How do teachers assure that assessments will be useful measures of learning?

Construction of useful assessment begins with **learning targets** that are **specific** and written in **accessible language**. Teachers limit the number of learning targets so that students are not overwhelmed and student have ample and flexible time with scaffolding to master essential content and skills. For example, when trying to teach 3rd graders how to write a good expository paragraph, consider only including 3 or 4 learning targets:

- I know how to write a topic sentence that tells the **general idea** of the paragraph.
- I can give **specific examples and details** to explain the general idea.
- I can stick to the topic.

How do teachers encourage students to assess their work?

Well-written **rubrics** allow students to assess their work. Rubrics useful to learners:
- Focuses on **only a few learning targets**
- Contains **student-friendly language**
- Provides **descriptive detail** that defines various levels of success

Descriptions of qualitative differences in the work are more important than the **quantity** in most rubrics. It is tempting to just use numbers to distinguish levels in a rubric. Students are **taught** how to use the rubric to evaluate their work. A helpful starting point is to have students use a rubric to assess model or anchor papers.

Begin with the extremes—a well constructed product and a poor sample of student work. Allow students to identify the strengths and weaknesses in the products and formulate a rubric from their suggestions. Together, practice the **strategies** students will use to improve their work. Then, progress to analyzing mid-range products (2s and 3s on a 4-point rubric scale). Focus on one learning target at a time when examining sample products so students are able to isolate the intended learning. Before students practice scoring and improving their work, have them work in pairs on anonymous student work. When students learn how to give themselves descriptive feedback about their conceptual understanding of the content is realized. (http://www.nycenet.edu/NR/rdonlyres/5CF749A8-D90F-4646-BEAF-9DD3130EB82E/2716/AppendixC.pdf)

How do teachers develop relationships with students that promote student involved assessment?

It is essential that teachers first establish a close, trusting relationship with students. The skills that DuFour describes for building a Professional Learning Community with colleagues are also useful when establishing relationships with students. Being present, and open, listening without judging, seeking common understandings, and viewing learning as mutual all lead to the development of a positive collaborative atmosphere. A teacher should seek to inspire students through their own passion for ongoing growth and show young people why they should be committed to their own development. Teachers should ask themselves, "How can I develop a sense of safety that enables and encourages students to take risks and reattempt tasks at which they have failed or been incapable of completing in the past?" and "What grading practices motivate students to continually strive for mastery and excellence?"

How do teachers set up situations so that students are more involved in determining the course of their learning?

A powerful way to involve students in their learning is to systematically engage them in shared **goal setting**. In order for students to set goals and monitor their progress, they must clearly understand what learning is essential. When students are involved in setting goals and have a clear understanding of their mission, they have a sense of ownership, self-awareness, and control of their own development over time. Some questions for students might be: "What are your strengths and weakness in the discipline at hand?" and "What do you see as the greatest challenge for you as you move towards mastery in this area?" and "How will this goal inform your next steps as a learner?" As a result of this inclusive process, students are intrinsically motivated to take the necessary steps to achieve those goals.

What are some ways that students can use communication skills to empower themselves in their learning?

Portfolios "provide an ideal venue for getting [students] to take notice of, keep track of, and celebrate their learning. Collecting, organizing, and reflecting on their own work builds an understanding of themselves as learners and nurtures a sense of accomplishment. Becoming reflective learners, developing an internal feedback loop, learning to set goals, and noticing new competencies and new challenges are all habits of thought we can cultivate in students through the use of portfolios." (Stiggins, 2004)

Students also benefit when they communicate their parents about their progress. Student-planned and lead conferences with teachers and parents creates a shared, interdependent audience for student self-assessment. Selecting work to discuss, talking about their strengths and weaknesses, and sharing goals helps students to process learning. Teachers might guide students in preparing for the conference by supplying a framework like the one below.

Figure 7. Framework for a Student-Led Conference

Name: _____   **Date:** _____

Learning Target(s)	
Evidence of where I started	
Evidence of where I am now	
What I did to improve	
What I can do now that I couldn't do before	
What to notice about my work	

Date of conference:

Start and end times:

Participant(s):

Comments from participant(s):

(Stiggins, 2004)

Instruction

The instruction component is organized into five main parts: disciplined inquiry; scaffolding for student learning; grouping strategies; other teacher decisions when planning for learning; and, using the learning plan format. Teachers select, design, and structure tasks and activities to ensure student engagement with and learning of the content, skills, and processes central to the lesson, unit, subject, and discipline.

Questions to Consider
> What does teaching that ensures high levels of learning by all students look like?
> What impacts retention of content and skills?
> What influences student engagement?

Disciplined Inquiry: The Core of the Framework for Quality Learning

According to McTighe, Seif, and Wiggins (2004), students make meaning when they are asked to inquire, think at high levels, and solve problems. However, there is a great deal of variance in terms of what educators accept as inquiry. What is inquiry? Is inquiry students seeking to confirm something that is already known? Is inquiry students investigating a question posed by their teacher? Is inquiry developing skills and strategies to pose and seek answers to questions of personal interest in the context of lifelong learning?

Dr. Richard Rezba from Virginia Commonwealth University, has identified four different levels of classroom inquiry on a continuum from structured to open-ended (Table 7).

Level of Inquiry	Description
Confirmation/Verification	Confirmation of a principle through an activity when the results are known in advance
Structured Inquiry	Investigation of a presented question using a teacher-prescribed process
Guided Inquiry	Investigation of a presented question using student-designed process
Open Inquiry	Investigation of a student-formulated question using student-selected process

Table 7. Levels of Inquiry

Inquiry in the context of lifelong learning requires the disciplined marriage of skills, strategies, and mindsets. To engage in inquiry for understanding, one must be willing to grapple with difficult issues and complex questions while constructing new meaning from a state of cognitive dissonance. Inquiry is often messy as it is active and requires the use of multiple senses. A key implication of the use of inquiry in the classroom is the shift from *teacher-determined* to *student-centered* classrooms. Students are invested in the process of building knowledge and acquiring new skills through the activation of their interests.

> *Tell me and I forget. Show me and I remember. Involve me and I understand.*
> Chinese proverb

An inquiry process can engage students in meaningful learning in all disciplines. Students in a civics class might investigate the relationship between power and choice within a historical context by analyzing primary source documents, asking and answering questions like "What is the cost of choice?" or "Does everyone have power?" In conducting historical inquiry, students identify a historical issue, investigate that issue, and draw conclusions or make judgments about it. Math students might use manipulatives and calculators to identify patterns in mathematical models, developing and testing functions in order to explore their conjectures, resulting in a deeper level understanding. The art, music, and politics of a given time period might be explored in a language arts class to deepen understanding of a piece of literature or students might investigate text to deepen understanding of history. It is important to understand that the use of inquiry can help students develop deep understanding across disciplines. Specific examples of inquiry in the context of standards-based, concept-centered learning are included in Appendix B Levels of Inquiry.

Providing authentic models and regular opportunities for students to apply knowledge and skills in the context of genuine problem solving often requires resources outside of the classroom. Interdisciplinary connections are often made through lesson extensions such as field trips, community-based projects, open inquiry, and inventive uses of technology to extend beyond the walls of the classroom. While inquiry is more than just asking questions, teachers facilitate learning through inquiry when they develop multiple contexts for questions and questioning and collaborate with students to collect and make meaning of data and information.

Scaffolding for Student Learning

An activity at the Confirmation/Verification level of inquiry is most useful when teachers pre-assess students' prior knowledge and/or have misconceptions about a topic or concept. This approach often follows the question, "How do we know…?"   The other three levels of inquiry progress from teacher-directed to student-directed study. When students learn about a topic or concept for the first time, using a more structured approach to exploring the material is likely the most effective. As students master the basic understandings, the opportunity to design their investigations or explore other aspects of the topic or concept will allow them to gain a deeper overall grasp of the material. Think of the runner who spends hours each week working with a coach, usually in very structured ways, to master the

the sport – getting out of the blocks, pacing, stride, endurance, hurdles, crossing the finish line – as well as combining those skills for fluid performance. But in competition, the runner applies that acquired knowledge to maximize his performance in relation to various challenges – weather conditions, lane on the track, competitors. Through each practice and competition the athlete reaches new levels of proficiency. As students engage in inquiry based strategies, teachers must ensure that all students rise to new challenges.

How can teachers ensure all students will be successful as they encounter new experiences? A variety of materials, support, and management mechanisms should be used to provide instruction that is responsive to students' interests, degrees of readiness and learner profiles. Teachers must provide opportunities for students to demonstrate their ability to produce high-quality work involving authentic issues, problems, and essential questions related to units of study. The content, processes, and products addressed in a unit should vary in order to attend to the standards and support the students. Likewise, teachers must thoughtfully manage the complexity and pace of tasks and activities to ensure instruction is targeted to student needs.

Multifaceted assessment is the cornerstone to differentiation. Knowing a student's interests, prior knowledge, ability, and academic, cultural and social background allows the teacher to construct or negotiate specific opportunities to meet the individual needs of the student.

Grouping Strategies

Students benefit from having multiple opportunities to work within a variety of grouping structures. Flexible groups can be structured based on readiness, interest, and learner profile and can be heterogeneous or homogeneous. Used effectively, grouping of students allows for social development and provides opportunities for students to develop an understanding of their strengths and weaknesses related to a specific task or assignment while developing strategies for strengthening their weaknesses through peer modeling and assistance. Flexible grouping provides students opportunities to work in different contexts and provides teachers opportunities to observe students in different situations. Depending upon the specific task or assignment, groups may remain intact for extended periods of time or be in place for a short time within a single class meeting. In addition, teachers may vary constructing groups and allowing students freedom in choosing groups.

Five elements play a part in the success of grouping and the application of these elements sets "group work" apart from "cooperative learning." The five elements (Johnson, Johnson, and Smith, 1991) are:
- positive interdependence
- individual accountability
- face-to-face interaction
- social skills development
- group processing, including collaborative self-assessment of group work

Other Teacher Decisions When Planning for Learning

Instructional Models: Teaching Content and Thinking Skills
An instructional model acts as a blueprint for teaching. However, just as blueprints do not dictate all actions of engineers, instructional models are not intended to dictate actions of teachers. Teachers must select the appropriate model in order to achieve a specified goal, just as engineers select appropriate designs or methods based on desired outcomes. Models differ from general teaching strategies because they are designed to reach specific goals. In fact, instructional models generally include a variety of instructional strategies. (Eggen & Kauchak, 2001) The sample instructional models outlined in Appendix D, designed to help students learn content and develop thinking skills, include many high-yield instructional strategies identified by Robert Marzano (2001) and his colleagues.

High-Yield Instructional Strategies
In <u>Classroom Instruction that Works: Research-based Strategies for Increasing Student Achievement</u>, Robert Marzano (2001) and his colleagues identify nine high-yield instructional strategies through a meta-analytic study of over 100 independent studies. Marzano and his colleagues found that these nine strategies have the greatest positive effect on student achievement for all students, in all subject areas, at all grade levels, especially when strategically matched to the specific type of knowledge being sought. Therefore, these strategies should be incorporated into lessons in the Unit Plan Framework. Marzano's nine high-yield instructional strategies are summarized in Appendix E.

Technology to Support Learning

The effective use of technology has many positive effects on the *process* of student learning. As outlined in the Division's Comprehensive Technology Plan, the Division believes that technology:

- enhances regular classroom instruction by providing instructional modes that support best practices and extensive access to learning resources;
- accommodates different learning styles and paces;
- provides intervention for some students while encouraging others to take their learning experience in exciting new directions;
- creates positive student attitudes about learning;
- promotes and improves productivity and skills that are vital both in the educational setting and in the workplace--teamwork, communication, presentation, and problem-solving; and,
- breaks down physical and social barriers and reduces classroom isolation.

Furthermore, technology used to support project- or problem-based instruction that promotes application of knowledge, skills, and higher order thinking has a positive impact on student achievement (Wenglinsky, 1998), the primary goal of this system model for high quality teaching and learning. It is important that unit developers ask a key question when making instructional technology decisions: How will use of this technology help students develop and demonstrate deep understanding of the key concept(s) in this unit?

Planning Learning Opportunities for All Students

A variety of assessment data in Albemarle County Public Schools indicates that students in the Division perform well when asked what they know, a little less well when asked what they understand, and relatively poorly when asked to apply what they know and understand in a non-routine real-life context. These data will only change in response to changes in the routine learning opportunities provided to students. The Learning Plan Format included in the Framework for Quality Learning is designed to scaffold teachers through developing and executing such learning opportunities. Teachers working in professional learning communities constantly seek to improve the learning of all students by exploring the following key questions:

- What do we want each student to learn?
- How will we know each student has learned it?
- How will we respond when students experience difficulty in learning?
- How will we deepen the learning for students who have already master the knowledge and skills?

Using the Learning Plan Format
In planning concept-centered learning, teachers identify essential understandings, questions, knowledge and skills, and assessment in advance of planning instruction. Instructional strategies and activities are crafted to support essential understandings and the type of knowledge (Marzano, 2001). Learning plans describe the suggested instructional model and strategies, vocabulary, resources and materials required, procedure, grouping strategies, differentiation, and extension (Figure 8 and Appendix C).

Albemarle County Public Schools
Learning Plan Format

Unit: *What unit of study does this lesson support?*

Lesson Description: *How will student describe this lesson?*

Students will know: *What ideas, concepts, information, and facts will students be able to recall or recite?*

Students will understand: *What ideas, concepts, information, and facts will students be able to explain, interpret, manipulate or apply in new situations?*

Students will be able to: *What skills will students demonstrate?*

Vocabulary: *What terms must students know and use?*

Instructional model/strategies: *Which instructional models and strategies are most suited to the specific knowledge and skills addressed in this lesson?*

Resources/Materials: *What resources/materials must be available to students? How will these materials and resources enhance student engagement and provide opportunities for differentiation?*

Procedure: *What procedure(s) that engage students will be implemented in this lesson? What will students do during the lesson? What aspects of the lesson will present novelty, variety, and choice?*

Grouping Strategies: *What instructional grouping will be used to support high levels of engagement and learning by all students? What opportunities will students have to engage with peers and others related to this lesson?*

Differentiation: *How will you use strategies, materials, and grouping to meet the needs of all learners?*

Extension: *What opportunities will be offered to extend this lesson beyond the classroom time allotted?*

Formative Assessment(s): *How will students set their goals and assess their progress? How will rubrics, models, self-assessment, and repeated practice with specific feedback be used to improve student learning? How will students' performance in this lesson shape the next steps in your instruction? What is the significance of the student performance?*

Figure 8. Learning Plan Format

Sources: Adapted from Erickson, 2002; McMillan, 2001; Wiggins & McTighe, 1998.

Putting the Big Ideas of the Framework for Quality Learning to Work

The primary purpose of the Framework for Quality Learning is to guide educators as they ensure all students learn that which is necessary to be successful in school and in life. The Framework for Quality Learning enables and empowers us to meet the goals of the Division's Strategic Plan, particularly Goals 1 and 2:

Goal 1: Prepare all students to succeed as members of a global community.
Goal 2: Eliminate the achievement gap.

Teachers work concurrently toward both goals as they use the Framework for Quality Learning to design and execute curriculum, assessment, and instruction. Our vision, mission, and goals demand a plan for rigorous and relevant learning by *all* students. The best of plans will fail if executed in the absence of relationships, people-to-people, lesson-to-lesson, or year-to-year.

From Fullfiling the Promise of the Differentiated Classroom: Strategies and Tools for Responsive Teaching (Tomlinson, 2003, p. 87):

> ***Looking Back and Ahead***
> *"Please invest in me," says the student.*
> > *Once they agree, teachers are guided by three assumptions:*
> > 1. *Because I see your value, I will connect with you.*
> > 2. *Because I see your uniqueness, I will come to you on your own terms and in accordance with your own needs.*
> > 3. *Because teaching is part of connecting, I will honor you by teaching you what matters most in your life.*

History and Social Science

History and Social Science Concepts	Enduring Understandings
Individual Development and Identity	Ethical values, cultures and institutions shape identity and behavior.
Civilization, Cultural Diffusion and Innovation	Civilizations are marked by social, technological and political complexity.
Human Interaction with the Environment	Geography influences human development and in turn, is influenced by human development.
Values, Beliefs and Political Ideas	The interplay among ideas, values and leadership shape the human condition, past, present and future.
Conflict and Cooperation	Nations and societies choose conflict or cooperation, isolationism or interdependence.
Comparative History of Major Developments	Patterns of change and continuity, cause and effect, manifest themselves across time and place.
Patterns of Social, Economic and Political Interaction	Power shapes systems, structures, and worldviews.

History and Social Science Habits of Mind

- Understand the significance of the past to one's own life, both private and public, and to society.
- Distinguish between the important and the inconsequential to develop the "discriminating memory" that is needed to making wise judgments.
- Develop historical empathy and perceive past events and issues as experienced by individuals and diverse groups living at the time.
- Acquire and act upon an understanding of diverse cultures, and of a shared humanity.
- Seek and recognize patterns and complex relationships including change over time, cause and effect, similarities and differences.
- Recognize the importance of individuals who have made a difference in history and the significance of personal character for both good and ill.
- Apply an understanding of the relationship between geography and history, as a matrix of time and place, and as context for events and choices.
- Appreciate the irrational and the accident in history and human affairs.

Language Arts

Interdisciplinary Concepts	Language Arts Concepts	Enduring Understandings
Systems	Morphemic Structure Grammar Genre	− Language is a system of discrete patterns and symbols, including words, letters, grammar, and syntax. − The purpose of a language, as a system, is to create meaning. − Systems and structures define the various genres.
Change & Continuity	Cultural Context Etymology	− Language is dynamic – multiple factors affect the evolution of language. − Change and continuity in language and literature reflect individual and societal evolution.
Communication	Author's Craft Author's Purpose Research	− Communication is making or conveying meaning. − Language is intentional – a tool for processing and communicating one's ideas about the world. − All reading, writing, and speaking centers around audience and the desired effect on that audience.
Aesthetics	Literary Elements Style Syntax	− Beauty is cultural and individual. − Words are powerful. − Ideas are communicated figuratively and complexly. − Tone, mood, and voice enhance the subjective experience of language.
Universality	Theme/ − Search for Identity − Coming of Age − Cooperation vs. Isolation − Honoring the Historical Past − Tolerance of the Atypical − Search for Knowledge − Epic Journey − Battle Between Good & Evil	− Certain themes pervade literature. − Individual, cultural, and societal connections enrich literature. − Historical and cultural contexts enhance understanding. − Certain works transcend their historical and cultural contexts.

Language Arts Habits of Mind

− Habits of Mind are the metacognitive processes of scholars working in the discipline. A scholar in English language arts:
− Understands and appreciates how literature both reflects and contributes to culture.
− Sees reading and writing as inextricably connected, reading print through the eyes of a writer and writing with the eyes of a reader.
− Searches for meaning in literature that can enrich and illuminate other texts, the reader's own life, and the world in which we live.
− Reads to understand both the influences of other texts upon the text at hand and the author's perception of his/her world.
− Seeks patterns or themes in written works.
− Reads and writes with empathy, identifying alternate points of view even if s/he does not agree with them.
− Is metacognitive of his/her personal processes in reading and writing, thus able to monitor and control his/her own reading and writing processes.
− Is persistent with challenging texts and ideas, employing appropriate strategies to derive meaning.
− Reads and writes to master the art of language usage and to demonstrate his/her personal interpretations of text, theme, and human experience.
− Uses specific tools to write more effectively.

Mathematics

Interdisciplinary Concepts	Mathematics Concepts	Enduring Understandings
Systems	Relationships Quantifying Representation	Relationships among numbers and number systems form the foundations of number sense and mathematical communication. Spatial relationships can be described using coordinate geometry and other representational systems. Attributes of objects can be measured using processes and quantified units, using appropriate techniques, tools, and formulas.
Properties and Models	Models Analysis and Evaluation	Situations and structures can be represented, modeled, and analyzed using algebraic symbols. Mathematical models are used to predict and make inferences about data. Data can be collected, organized, and displayed in purposeful ways. Various statistical methods can be used to observe, analyze, predict, and make inferences about data.
Change and Interactions	Patterns Cause and Effect	Patterns and relationships among operations are essential to making estimates and computing fluently. Patterns, relations, and functions can be recognized and understood mathematically. Change, in various contexts, both quantitative and qualitative, can be identified and analyzed.
Communication	Reasoning (Justification) Theory	Characteristics, properties, and mathematical arguments about geometric relationships can be analyzed and developed using logical and spatial reasoning. Transformations, symmetry, and spatial reasoning can be used to analyze and model mathematical situations. Probability and data analysis can be used to make predictions.
Mathematic Habits of Mind		
Analyze situations in mathematical terms and pose and solve problems based on situations observed Select and use various types of reasoning to develop and evaluate mathematical arguments and proofs Organize and consolidate mathematical thinking through precise verbal, written, and graphical communication Understand how mathematical ideas interconnect and build on one another to produce a coherent whole Use representations to model and interpret physical, social, and mathematical phenomena Evaluate and use technology appropriately as a tool to support and apply the problem-solving process		

Science

Interdisciplinary Concepts	Discipline Concepts	Enduring Understandings
Change and Constancy	Cause and Effect Conservation Equilibrium	− Change can be identified and analyzed. − Natural processes and human activity can cause changes over time. − Change occurs in patterns, trends, and cycles. − Stability exists or otherwise occurs when changes are counterbalanced.
Communication	Model Theory	− Models facilitate understanding through the use of familiar concepts. − Models vary in complexity to represent different levels of understanding. − Theories may evolve to incorporate new knowledge. − Data can be collected, verified, organized, and communicated in purposeful ways.
Scale	Measurement Properties	− Properties characterize objects, organisms, and substances. − Measurement represents properties on a numerical scale. − Scale compares objects, living things, and events. − Scientists use tools and equipment to gather data.
Systems	Processes Organization Relationships	− Systems consist of organized groups of interactive and related parts that form a whole. − Systems can be open or closed with respect to matter and energy. − The properties of a system are different and more complex than its individual parts. − Systems can be interdependent.

Science Habits of Mind

− Shows curiosity and pursues answers to questions about the world.
− Maintains a balance of open-mindedness and skepticism, entertains new ideas, and challenges information not supported by good evidence.
− Respects the importance of reproducible data and testable hypotheses.
− Tolerates complexity, ambiguity and persists in the face of procedural uncertainties.
− Observes and expresses wonder about the natural world.
− Thinks and communicates with clarity and precision.
− Considers the impact of scientific decisions and activities.

Physical Education

Interdisciplinary Concepts	Discipline Concepts	Enduring Understandings
Systems	Skilled Movement Movement Principles and Concepts Performance Concepts and Principles	Use biomechanical principles to assess and improve skill Apply physiological principles Capable of recording, analyzing, and readjusting physical activity performance
Change and Continuity	Physically Active Lifestyle	Enjoy being physically active Have an understanding of which physical activities enhance their life socially, psychologically, and physically
Communication	Responsible Behavior	Accept and provide feedback to improve individual and group performance Use appropriate decision-making, conflict resolution and problem-solving skills
Aesthetics	Personal Fitness	Design and implement fitness plan that demonstrates understanding of future changes to accommodate life changes and uses available technology and resources
Universality – Human Experience	Responsible Behavior	Exhibit leadership roles and maintain an actively safe environment Work cooperatively in competitive and non-competitive activities Accept different points of view Demonstrate positive character traits

Physical Education Habits of Mind

- There are many interpretations of Habits of Mind. For our purposes, Habits of Mind refer to the characteristics displayed by a physically educated individual.
- Understand and follow a physically active lifestyle that promotes good health and wellness.
- Strive to improve skills necessary for participation in a physical activity.
- Promote a culture of physical activity.
- Willing to engage in new opportunities for physical activity.
- Establish and revise realistic goals for maintaining fitness/wellness.
- Respect the abilities of others.
- Appreciate the art of movement.
- Understand the rules, concepts, and strategies of sports and physical activities.
- Develop an understanding of the fundamentals of physical activity.
- Demonstrate fair play and good sportsmanship.
- Value individual and group accomplishment in terms of physical skills.
- Value physical activity for enjoyment, challenge, self-expression, and/or social interaction.

Fine Arts

Interdisciplinary Concepts	Discipline Concepts	Enduring Understandings
Aesthetics	Style Composition Craftsmanship Design Elements Critique Harmony	– Style and composition govern the quality of artistic pieces. – Beauty is cultural and individual.
Expression	Creativity Artist Craft Technique Fluency Style / Mood Emotion	– Techniques and fluency facilitate and provide options for expression. – The arts communicate emotion through style and mood. – The arts allow expression to become enduring across time and place.
Communication	Critique Artist Craft Emotion Purpose Audience	– Individual and cultural responses to art change over time and across cultures. – The arts educate, persuade, inform, and / or entertain. – The meaning of an artistic product is shaped by both the intent of the artist and the perception of the audience.
Culture	Identity Symbol	– The arts can promote social change and reflect social values and ideals. – Cultures influence artists and artists influence culture – The arts facilitate cultural identity.
Relationships / Symphony	Tolerance of the Atypical Cooperation vs. Isolation Audience Part to Whole	– Arts link common human experiences across cultures. – Audience influences artistic endeavors. – An artistic product is the result of a synthesis of elements that gain new meaning through their fusion.
Habits of Mind ofr Fine Artists		

Engaging in the arts allows students to:
– Develop a life-long appreciation of the arts and their impact on daily choices.
– Seek opportunities for self-expression.
– Search for meaning.
– Experiment, play and take risks in creation of art.
– Respect other peoples' way of thinking, working, and personal expressions.
– Use problem-solving processes.
– Make decisions in situations where there are no standard answers.[1]
– Analyze, critique, evaluate, and reflect on communications and make informed judgments.

World Languages

Interdisciplinary Concepts	Discipline Concepts	Enduring Understandings
Communication	Systems Grammar Meta-linguistics (non-verbal communication) Syntax	− Language is appreciated and used verbally, non-verbally and culturally. − Language is used to express, interpret, and respond with both eloquence and practicality.
Comparisons	Interpretation Translation	− Patterns are intra- and inter-lingual. − Language knowledge heightens awareness of one's native and other languages. − Linguistic decisions are made based on cultural differences.
Cultures	Styles Customs Mores	− Culture shapes languages. − Cultural aspects and products help define languages. − A language, in turn, shapes a culture. − Interaction between different cultures influences the evolution of languages.
Connections	Style Purpose	− Connections between cultures exist on a continuum across time, space and fields. − Language is universal.
Communities	History Political relationships	− The universality of the human experience is shared through language. − Physical environments affect and shape language. − Communities are language catalysts. − History and political power impact languages throughout history.

Habits of Mind
− Respects the relationship of communicators – etiquette/manners, civility, etc. − Actively engages others through communication. − Sees that words are made up of parts (morphemes, etc.) that give them meaning. − Knows how, when and why to say what to whom.

Interdisciplinary Concepts	Discipline Concepts	Enduring Understandings
Interaction	Technology Patients/Clients/ Customers Colleagues Resources Community	- Interaction happens with patients, clients, or customers to deliver a product or service. - Interaction with technology is essential to stay competitive in the global workplace. - Interaction with colleagues is an essential skill. - Interaction with resources is vital for efficiency and productivity in the workplace.
Systems	Technology Organizational Performance Production Evaluation	- There is an evaluation system that can be internal and/or external. - Organizational hierarchies vary in the workplace. - One will encounter various types of technological systems in the workplace.
Conflict and Cooperation	Conflict Leadership Teamwork Responsibility	- Conflict is inevitable. - Conflict and cooperation occur when working on a team. - Conflict is manageable
Change and Continuity	Skills Environment Procedure Service Culture Physical	- A diverse workplace environment that may require adaptation. - An environment that may be characterized by diversity. - Apply and adapt a variety of appropriate strategies to solve new and increasingly complex problems. - Continuity among products and services is important to be successful in a global market.
Communication	Protocols Mediums Professional Skills-Oral/Written Policy Culture(Global Interface)	- There are a variety of mediums though which to communicate. - Communication skills are necessary to be successful. - There are expectations of communicating in a professional manner. - Communication protocols and policies exist within the workplace. - Culture effects communication.

Levels of Inquiry

Example from Science

This example is a simple activity that involves studying the reaction rates of the antacid Alka-Seltzer in water at different temperatures. Dr. Rezba has adjusted this activity to fit in each of the different levels of inquiry.

CONFIRMATION/VERIFICATION - Confirmation of a principle through an activity when the results are known in advance.

"In this investigation you will confirm that the rate of a chemical reaction will increase as the temperature of the reacting materials increases. You will use the commercial antacid Alka-Seltzer to verify this principle. Using the following procedure, record the results as indicated, and answer the questions at the end of the activity."

STRUCTURED INQUIRY - students investigate a teacher-presented question through a prescribed procedure.

"In this investigation you will determine the relationship between temperature and reaction rate of substances. You will be using the commercial antacid Alka-Seltzer and water of varying temperatures. Using the following procedure, record the results as indicated, and answer the questions at the end of the activity."

GUIDED INQUIRY - students investigate a teacher-presented question using student selected procedures.

"Design an investigation to answer the question: What effect will water temperature have on the rate at which an Alka-Seltzer will react? Develop each component of the investigation including a hypothesis, procedures, data tables, appropriate graphs, and conclusions. Implement your procedure when it has been approved by your teacher."

OPEN INQUIRY - students investigate topic-related questions, which are student formulated through student-selected procedures.

"Design an investigation to explore and research a chemistry topic related to the concepts we have been studying. Implement your procedure when it has been approved by your teacher."

Levels of Inquiry

Example from History/Social Studies

This example illustrates the different levels of inquiry in an Ancient Civilizations Archaeological Dig for second and third graders.

CONFIRMATION/VERIFICATION-confirmation of a principle through an activity when the results are known in advance.

Hello, fellow archaeologists! Today you will be looking for artifacts from different ancient civilizations and discovering how these ancient civilizations have impacted our lives today. You will use a small brush to carefully move the sand away from the artifacts in your box, some related artifacts you may find are compasses, columns, etc. No one in your group may touch the artifact except the archaeologist that uncovered it. When an artifact is uncovered carefully place it on the lid of your box.   Using the given data collection sheet draw a picture of the discovered artifact in the first column. Now predict what the artifact might be or what it may have been used for in the middle column. Then record which ancient civilization you think the artifact may have come from.

STRUCTURED INQUIRY-students investigate a teacher-presented question through a prescribed procedure.

Hello, fellow archaeologists! Today you will uncover artifacts from different ancient civilizations. In this investigation you will be discovering how the artifacts from ancient civilizations have impacted our lives today. You will use a small brush to carefully move the sand around in your box to uncover artifacts in your box. No one in your group may touch the artifact except the archaeologist that uncovered it. When the artifact is uncovered carefully place it on the lid of your box. You will use the given data collection sheet to record your results and make predictions. Based on what you know about any of the ancient civilizations, what other "artifacts" would you include in this archaeological dig that would help explain how ancient civilizations have impacted our lives today?

GUIDED INQUIRY-students investigate a teacher-presented question using student-selected procedures.

Today you will become archaeologists searching for answers to the question: How have ancient civilizations impacted our lives today?   As an archaeologist how do you think you can learn about the past through and archaeological dig? Using the provided sand tubs you will work together to uncover artifacts. As you uncover and examine your artifacts think about how you could classify the artifacts and record your information to help you answer our research question.

OPEN INQUIRY-students investigate topic-related questions, which are student formulated through student-selected procedures.

You are an archaeologist working on a dig in an ancient civilization. Using the provided sand tubs plan how you will uncover and research the treasures from the past. Begin your dig after approving your plan with your teacher.

Albemarle County Public Schools
Curriculum Unit Framework

Unit Title: _____	Grade Level: _____

Discipline/Topic Area(s): _____

Unit Designer(s): _____	Time Frame: _____

Unit Summary

Discipline-level Framework

Interdisciplinary Concept

Discipline Concept

Enduring Understandings: *What overarching understandings are derived from the relationships between organizing concepts?*

Lifelong-learner Standards: *Which life-long learner standards are central to this unit?*

Habits of Mind in this Discipline: *What habits of mind employed by adults working in this discipline are partially developed within this unit?*

Grade-level Framework

Content Standards: *Which SOL or discipline standards are central to this unit?*

Essential Questions: *What essential questions will focus this unit? What essential questions will drive inquiry and understanding within this unit?*

Interdisciplinary Connections: *What are the natural connections to other disciplines in this unit?*

Pre-Assessment(s): *What pre-assessment(s) and rubrics that define quality will be used to determine students' prior knowledge and/or misconceptions related to the essential knowledge, understanding, skills, and vocabulary in this unit? How will pre-assessment data be used to inform instruction?*

Essential Knowledge, Understanding, Skills, and Vocabulary

Students will know: *What ideas, concepts, information, and facts will students be able to recall or recite?*

Students will understand: *What ideas, concepts, information, and facts will students be able to explain, interpret, manipulate or apply in new situations?*

Students will be able to: *What skills will students demonstrate?*

Vocabulary: *What terms must students know and use?*

Summative Assessment(s): *What summative assessment(s) and scoring guides will be used to determine if students have mastered the essential knowledge, understanding, skills, and vocabulary in this unit? At what levels of Bloom's Taxonomy will students demonstrate mastery?*

Sources: Adapted from Erickson, 2002; McMillan, 2001; Wiggins & McTighe, 1998.

Albemarle County Public Schools
Learning Plan Format

Unit: *What unit of study does this lesson support?*

Lesson Description: *How will student describe this lesson?*

Students will know: *What ideas, concepts, information, and facts will students be able to recall or recite?*

Students will understand: *What ideas, concepts, information, and facts will students be able to explain, interpret, manipulate or apply in new situations?*

Students will be able to: *What skills will students demonstrate?*

Vocabulary: *What terms must students know and use?*

Instructional model/strategies: *Which instructional models and strategies are most suited to the specific knowledge and skills addressed in this lesson?*

Resources/Materials: *What resources/materials must be available to students? How will these materials and resources enhance student engagement and provide opportunities for differentiation?*

Procedure: *What procedure(s) that engage students will be implemented in this lesson? What will students do during the lesson? What aspects of the lesson will present novelty, variety, and choice?*

Grouping Strategies: *What instructional grouping will be used to support high levels of engagement and learning by all students? What opportunities will students have to engage with peers and others related to this lesson?*

Differentiation: *How will you use strategies, materials, and grouping to meet the needs of all learners?*

Extension: *What opportunities will be offered to extend this lesson beyond the classroom time allotted?*

Formative Assessment(s): *How will students set their goals and assess their progress? How will rubrics, models, self-assessment, and repeated practice with specific feedback be used to improve student learning? How will students' performance in this lesson shape the next steps in your instruction? What is the significance of the student performance?*

Sources: Adapted from Erickson, 2002; McMillan, 2001; Wiggins & McTighe, 1998.

APPENDIX D

Instructional Models: Teaching Content and Thinking Skills

An instructional model acts as a blueprint for teaching. However, just as blueprints do not dictate all actions of engineers, instructional models are not intended to dictate actions of teachers. Teachers must select the appropriate model in order to achieve a specified goal, just as engineers select appropriate designs or methods based on desired outcomes. Models differ from general teaching strategies because they are designed to reach specific goals. In fact, instructional models generally include a variety of instructional strategies. (Eggen & Kauchak, 2001) The sample instructional models outlined below, designed to help students learn content and develop thinking skills, include many high-yield instructional strategies identified by Robert Marzano (2001) and his colleagues.

Integrative Model
In the Integrative Model, students develop a deep understanding of organized bodies of knowledge while developing critical thinking skills. The model is designed to teach combinations of concepts, generalizations, principles, rules, facts and the relationships between them, typically through the use of matrices which may be either teacher or student-generated, depending on student readiness (e.g. a chart comparing characters in a literary work in terms of personal attributes, conflict, and symbolism). Students are expected to do the following: describe, compare, and search for patterns; explain similarities and differences; hypothesize outcomes for different conditions; and generalize to form broad relationships.

Social Interaction Model
The Social Interaction Model involves students working collaboratively to reach common goals, increasing learner involvement and providing leadership opportunities and decision-making experiences. It takes various forms including group work (e.g. think-pair-share, pairs check, and combining pairs), cooperative learning (e.g. student teams achievement division, jigsaw, and group investigation), and discussion.

Inductive Model
In the Inductive Model, students use information that illustrates concepts to search for relationships that lead to uncovering of principles, generalizations, and rules, thus allowing students to acquire a deep understanding of those concepts. Illustrations may include concrete materials, pictures, models, case students, simulations, and role play. The Inductive Model is grounded in the view that learners construct their own understanding of the world rather than recording it in an already-organized form.

Concept-Attainment Model
Using examples and non-examples to illustrate concepts, the Concept-Attainment Model employs inductive strategies to help students reinforce their understanding of concepts and practice hypothesis testing. As additional examples and non-examples are examined, students analyze possible hypotheses. Students then isolate a hypothesis and form a definition. In the final phase of the model, students analyze additional examples based on the definition.

Concept-Development Model
The Concept Development Model builds on students' prior knowledge and refines and extends concept information so that students can understand increasingly complex and abstract ideas. Students list, group, and regroup items related to a subject, verbalizing common attributes and revealing thought patterns. Students label the groups, draw inferences, and make generalizations from the specific data available to them. Finally, creating a one-sentence summary about each of the groupings, students demonstrate understanding of multiple relationships.

Problem-based Model
The Problem-based Model is designed to teach problem-solving skills and content and to develop self-directed learning. The model uses a problem or a question as a focal point for student-led investigation and inquiry. Problem-based learning is a broad family of teaching models that includes problem solving, inquiry, project-based learning, and case-based learning.

Direct-Instruction Model
With emphasis on active teaching and high levels of student involvement, the Direct Instruction Model focuses on both concepts and skills. In this model, the teacher structures the topic, explains it to students, provides students with opportunities to practice, and gives feedback. Control of learning gradually shifts from teacher to learners.

Lecture-Discussion Model
The Lecture-Discussion Model uses a teacher-centered approach to help students understand organized bodies of knowledge. Teachers use advanced organizers at the beginning of a lesson to preview and structure new material, linking it to students' existing network of organized and interconnected ideas and relationships.

High-Yield Instructional Strategies

In Classroom Instruction that Works: Research-based Strategies for Increasing Student Achievement, Robert Marzano (2001) and his colleagues identify nine high-yield instructional strategies through a meta-analytic study of over 100 independent studies. Marzano and his colleagues found that these nine strategies have the greatest positive effect on student achievement for all students, in all subject areas, at all grade levels, especially when strategically matched to the specific type of knowledge being sought. Therefore, these strategies should be incorporated into lessons in the Unit Plan Framework. Marzano's nine high-yield instructional strategies are summarized in the table that follows.

Strategy	Research Says:
Identifying similarities and differences	Students should compare, classify, and create metaphors, analogies, and graphic representations.
Summarizing and note taking	Students should learn to delete unnecessary information, substitute some information, keep some information, write and rewrite, and analyze information.
Reinforcing effort and providing recognition	Teachers should reward based on standards of performance and use symbolic recognition rather than tangible rewards.
Homework and practice	Teachers should vary the amount of homework based on student grade level (less at the elementary level, more at the secondary level), keep parent involvement in homework to a minimum, state purpose, and, if assigned, should be commented on.
Nonlinguistic representations	Students should create graphic representations, models, mental pictures, drawings, pictographs, and participate in kinesthetic activity in order to assimilate knowledge.
Cooperative learning	Teachers should limit use of ability groups, keep groups small, apply strategy consistently and systematically but not overuse.
Setting objectives and providing feedback	Teachers should create specific but flexible goals, allowing some student choice. Teacher feedback should be corrective, timely, and specific to a criterion.
Generating and testing hypothesis	Students should generate, explain, test and defend hypotheses using both inductive and deductive strategies through problem solving, history investigation, invention, experimental inquiry, and decision making.
Questions, cues, and advance organizers	Teachers should use cues and questions that focus on what is important (rather than unusual), use ample *wait time* before accepting responses, eliciting inference and analysis. Advance organizers should focus on what is important and are more useful with information that is not well organized.

Increasing Effect Size

Crosswalk of Life Long Learner Standards and Workplace Readiness Skills

Albemarle County Schools' Lifelong-Learner Standards	Virginia's Workplace Readiness Skills
1. Plan and conduct research	Demonstrate reading skills on a level required for employment in a chosen career field (A) Demonstrate computer literacy on a level required for employment in a chosen career field (E) Demonstrate reasoning, problem-solving, and decision-making skills (F) Demonstrate a strong work ethic (H) Demonstrate independence and initiative (J)
2. Gather, organize, and analyze data; evaluate processes and products; and draw conclusions	Demonstrate computer literacy on a level required for employment in a chosen career field (E) Demonstrate reasoning, problem-solving, and decision-making skills (F) Demonstrate a positive attitude (I)
3. Think analytically, critically, and creatively to pursue new ideas, acquire new knowledge, and make decisions	Demonstrate reasoning, problem-solving, and decision-making skills (F) Demonstrate a strong work ethic (H) Demonstrate independence and initiative (J)
4. Understand and apply principles of logic and reasoning; develop, evaluate, and defend arguments	Demonstrate understanding of the "big picture" (G) Demonstrate self-presentation skills (K)
5. Seek, recognize and understand systems, patterns, themes, and interactions	Demonstrate understanding of the "big picture" (G)
6. Apply and adapt a variety of appropriate strategies to solve new and increasingly complex problems	Demonstrate reasoning, problem-solving, and decision-making skills (F)
7. Acquire and use precise language to communicate ideas, knowledge, and processes	Demonstrate reading skills on a level required for employment in a chosen career field (A) Demonstrate math skills on a level required for employment in a chosen career field (B) Demonstrate writing skills on a level required for employment in a chosen career field (C) Demonstrate speaking and listening skills on a level required for employment in a chosen career field(D) Demonstrate self-presentation skills (K)
8. Explore and express ideas and opinions using multiple media and technology	Demonstrate computer literacy on a level required for employment in a chosen career field (E) Demonstrate reasoning, problem-solving, and decision-making skills (F) Demonstrate self-presentation skills (K)
9. Demonstrate ethical behavior and respect for diversity through daily actions and decision making	Demonstrate reasoning, problem-solving, and decision-making skills (F) Demonstrate a strong work ethic (H) Demonstrate a positive attitude (I) Participate as a team member to accomplish goals (M)
10. Participate responsibly in civic life, and act on democratic ideals within the context of community and global interdependence	Demonstrate understanding of the "big picture" (G) Demonstrate a strong work ethic (H) Demonstrate a positive attitude (I) Participate as a team member to accomplish goals (M)
11. Understand and follow a physically active lifestyle that promotes good health and wellness	Demonstrate a positive attitude (I) Demonstrate independence and initiative Maintain satisfactory attendance (J) Demonstrate self-presentation skills (K)
12. Apply habits of mind and metacognitive strategies to plan, monitor, and evaluate one's own work	Demonstrate reasoning, problem-solving, and decision-making skills (F) Demonstrate understanding of the "big picture" (G) Demonstrate a strong work ethic (H) Demonstrate a positive attitude (I)

Updated 8/16/06

GLOSSARY

Accommodations*
Modifications in the way assessments are designed or administered so that students with disabilities (SWD) and limited English proficient students can be included in the assessment.

Alignment*
The process of linking concepts, content standards and performance standards to assessment, instruction, and learning in classrooms.

Alternative Assessment*
An assessment that requires students to generate a response to a question rather than choose from a set of responses provided to them.

Ancillary Standard
Content standards related to power standards.

Analytic Scoring*
Evaluating student work across multiple dimensions of performance rather than from an overall impression (holistic scoring).

Anchor Activity
Student learning activities that are ongoing and connected to central enduring and essential understandings. Anchor activities are used to keep students independently engaged while the teacher carries out learning activities with others.

Assessment*
The informal and formal processes of gathering, describing, or quantifying information about performance related to concepts, content and skills for purposes of instruction and demonstrating learning outcomes. Formative assessments should be linked to guiding questions, summative assessments link to the essential questions that drive study.

Assessment of Learning
Assessments that happen after learning is supposed to have occurred to determine if it did, used to make statements of student learning status (grades, tests, exams, etc.).

Assessment for Learning
Assessments that happen while learning is still underway, used to provide feedback so they can improve

Assessment System*
The combination of multiple assessments into a comprehensive reporting format that produces comprehensive, credible, dependable information upon which important decisions can be made about students, schools, districts, or states.

Anchor(s)*
A sample of student work that exemplifies a specific level of performance.

Authentic Performance Assessment
An assessment that requires the application of knowledge and skills in the form of a complex product through real life tasks.

Backwards Design
The design process should begin with identifying the desired results and then "work backwards" to develop instruction rather than the traditional approach which is to define what topics need to be covered.

Benchmark*
A detailed description of student performance expected at particular ages, grades, or development levels.

Classroom Assessment*
An assessment developed, administered, and scored by a teacher or set of teachers with the purpose of evaluating individual or classroom student performance on a topic.

Community of Learners
Classrooms and schools where norms encourage participation, inquiry, reflection, and analysis.

Concept
Mental construct or organizing idea that categorizes a variety of examples. Although the examples may differ in context, they have common attributes. Symmetry, for example, is a concept that is exemplified by many different examples, but all examples display the attribute of balance. Concepts are timeless, universal, abstract, and broad.

Constructed Response
Assessment that asks a student to perform or produce to demonstrate knowledge and skills. Such assessments will not have one right answer, but instead will result in student work that is across a range of quality.

Content Standards*
Broadly stated expectations of what students should know and be able to do in particular subjects and grade levels.

Criteria*
Guidelines, rules, characteristics, or dimensions that are used to judge the quality of student performances.

Criterion-Referenced Assessment*
An assessment where an individual's performance is compared to the specific learning objective or performance standard and not to the performance of other students.

Curriculum Mapping
Curriculum mapping is a process by which data regarding: what must be taught; what is actually taught; and, how well what must be taught was learned are collected and analyzed across classrooms, content areas, and grade-levels.

Diary Map
A diary map is one of the products of the curriculum mapping process. A diary map is created when a teacher updates a projection map with "diary entries" that reflect what actually happened within the instructional program.

Differentiation
Differentiation is a philosophy or mindset in which a teacher provides multiple paths related to content, process and product in order to meet the needs of diverse learners with respect to interest, readiness and learning profiles.

Dimensions*
Desired knowledge or skills measured in an assessment and usually represented in a scoring rubric.

Enduring Understanding
Broad generalizations and principles that connect two or more concepts in a statement of relationship.

Engagement
Students who are engaged are involved in their own learning. The joy of learning inspires the persistence to accomplish the desired goals even in the face of difficulty (Schlecty, 2002). When educators equip students with the tools to become self-motivated, real learning engagement takes place (Wasserstein, 1995). "Schlecty (2002) groups design qualities that foster student engagement into ten categories: Content and Substance, Organization of Knowledge, Product Focus, Clear and Compelling Product Standards, Safe Environment, Affirmation of Performance, Affiliation, Novelty and Variety, Choice, and Authenticity.
http://chiron.valdosta.edu/are/ebowenLitReview.pdf

Equity*
Equity is the concern for fairness, i.e., that assessments are free from bias or favoritism.

Essential Knowledge
What students need to know from unpacked content standards.

Essential Question
Questions that are developed in order to engage student learning. Essential questions are directly tied to essential understandings.

Essential Skills
Specific competencies required for complex process performance.

Essential Understanding
Statements that are used to focus learning. Essential understandings are derived through making connections between topics and enduring understandings.

Essential Vocabulary
Key content and process vocabulary related to the unit.

Evaluation*
When used for most educational settings, evaluation means to measure, compare, and judge the quality of student work, schools, or a specific educational program.

Extension
Pre-planned, open-ended experiences that emerge from learning goals and student interests and extend opportunities for learning beyond core content and the classroom.
Flexible Grouping
Grouping strategy where student membership is continuously evaluated and changed based on multiple criteria. Flexible grouping ensures that students are not placed in a "track."

Formative Assessment
An assessment intended to inform teachers and students on how to improve their learning.

Grouping
Varied approaches to arranging students for effective work in the classroom that accommodate student interests, questions, learning preferences, and prior knowledge and skill.

Habits of Mind (of an Adult Working in the Discipline)
Values, attitudes, and skills of an adult working in a discipline relating to her/his outlook on knowledge and learning and to ways of thinking and acting.

Holistic Scoring*
Evaluating student work in which the score is based on an overall impression of student performance rather than multiple dimensions of performance (analytic scoring).

Inquiry
A process for answering questions and solving problems based on facts and observations.

Instructional Model
Prescriptive teaching approach and strategies designed to accomplish particular instructional goals.

Instructional Strategy
Methods used to introduce, explain, demonstrate, model, coach, or guide in the classroom.

Item*
An individual question or exercise in an assessment or evaluative instrument.

Lifelong-learner Standard
A standard designed to provide students with a foundation for lifelong inquiry and learning.

K-12 concept
A K-12 concept is one or two words that are broad and abstract, timeless, universal in application and can be used to integrate the big picture across disciplines.

Norm-Referenced Assessment*
An assessment where student performance or performances are compared to a larger group.

Opportunity to Learn*
To provide students with the teachers, materials, facilities, and instructional experiences that will enable them to achieve high standards.

Pacing Guide
A pacing guide typically describes what units will be taught and the order and timeframe in which they will be taught.   A pacing guide does not include all of the elements of a projection map. Pacing guides are typically developed within a single grade-level or course.

Performance Assessment
An assessment that requires use of knowledge and skills in the form of a complex product.

Performance Standards*
Explicit definitions of what students must do to demonstrate proficiency at a specific level on the content standards.

Portfolio
A representative collection of student work that includes student reflection.

Portfolio Assessment*
A portfolio is an assessment when the assessment purpose is defined, criteria for selection of work are made clear, and criteria for assessing the collection or individual pieces of work are identified.

Power Standards
A subset of standards that represents what students must know, understand, and be able to do within a particular context in order to be successful in school, life, and on state and division assessments warranting marked focus and time.

Pre-assessment
An assessment used to identify prior knowledge and misconceptions before starting a new unit.

Projection Map
A projection map is one of the products of the curriculum mapping process. A projection map represents what is expected to happen within the instructional program. Projection maps are updated throughout the course of the school year, becoming diary maps over time.

Rater*
A person who evaluates or judges student performance on an assessment against specific criteria.

Rater Training*
The process of educating raters to evaluate student work and produce dependable scores.

Reliability*
The degree to which the results of an assessment are dependable and consistently measure particular student knowledge and/or skills.

Rubric
A detailed description of student work expectations describing varied levels of student achievement used to provide specific feedback to students.

Scaffolding
Instructional support that helps assure learner success while acquiring new skills and information or while working in areas of challenge.

Scale*
Values given to student performance.

Scope and Sequence Guide
A scope and sequence guide typically represents the goals for a curriculum area with specific standards for each grade level.

Scorer*
A person who evaluates or judges student performance on an assessment against specific criteria.

Scoring Guide
A guide used to score performance assessments in a reliable, fair, and valid manner and is generally composed of dimensions for judging student performance, a scale for rating performances on each dimension, and standards of excellence for specified performance levels.

Selected Response
Assessment where responses to an item, questions or prompts are selected from a list of possible responses and placed against a set answer key.

Standards*
The broadest of a family of terms referring to statements of expectations for student learning, including content standards, performance standards, and benchmarks.

Standardization*
A consistent set of procedures for designing, administering, and scoring an assessment.

Students With Disabilities (SWD)*
A broadly defined group of students with physical and/or mental impairments such as blindness or learning disabilities that might make it more difficult for them to do well on assessments without accommodations or adaptations.

Summative Assessment
Assessments used to sum up achievement, used for marking and grading.

Task*
An activity, exercise, or question requiring students to solve a specific problem or demonstrate knowledge of specific topics or processes.

Validity*
The extent to which an assessment measures what it is supposed to measure and the extent to which inferences and actions made on the basis of test scores are appropriate and accurate.

*Source: CRESST (http://www.cse.ucla.edu/resources/glossary_set.htm)

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