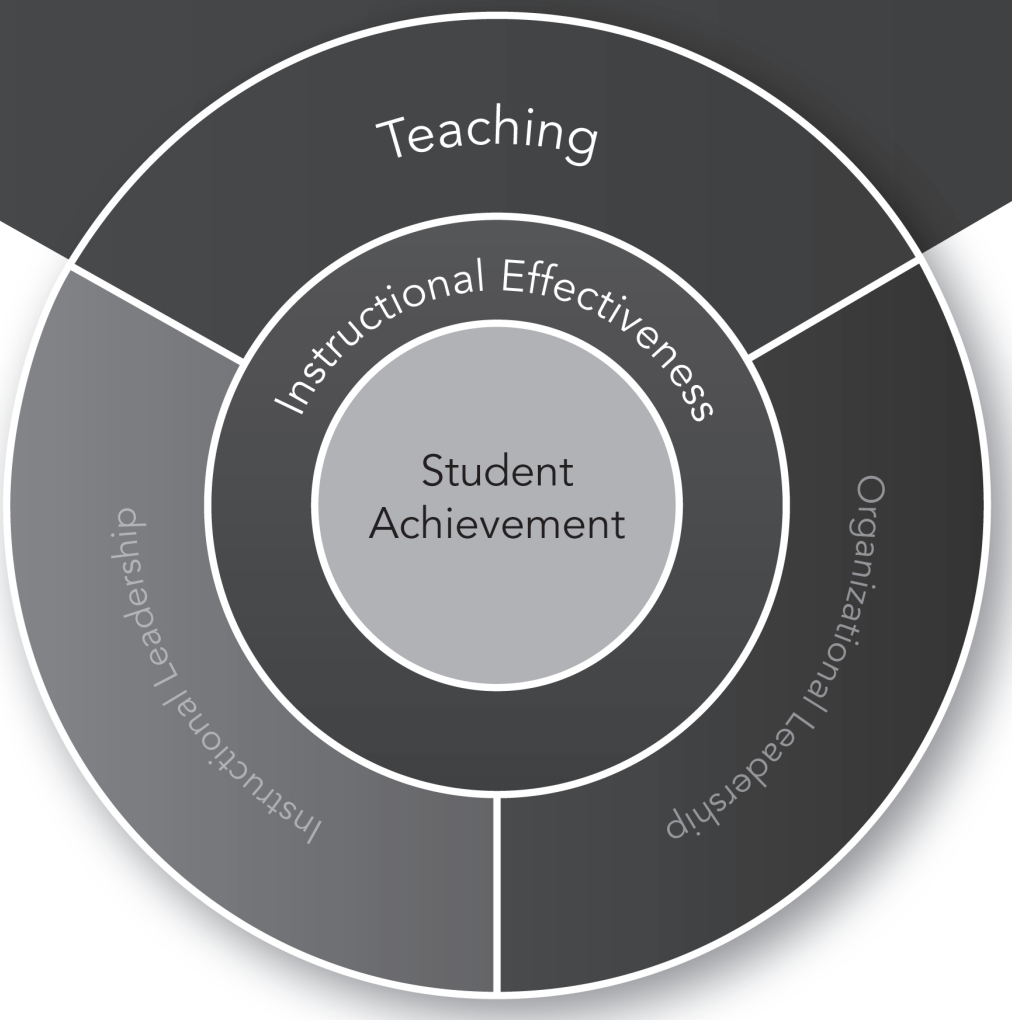
GRADE LEVEL

K-12

A HANDBOOK FOR TEACHERS

Using Rigor and Relevance to Create Effective Instruction



International Center for Leadership in Education
Rigor, Relevance, and Relationships for ALL Students

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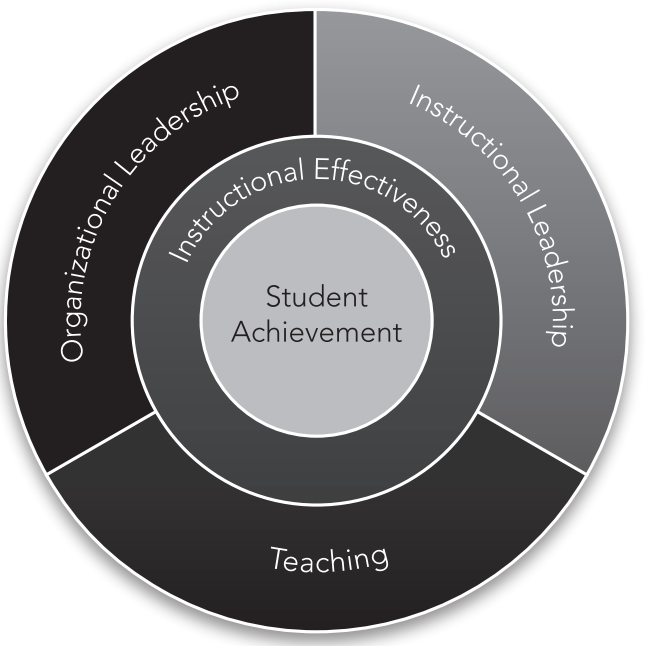
Overview

The Daggett System for Effective Instruction

The Daggett System for Effective Instruction (DSEI) provides a coherent focus across the entire education organization on the development and support of instructional effectiveness to improve student achievement. Whereas traditional teaching frameworks are teacher-focused and consider what teachers should do to deliver instruction, DSEI is student-focused and considers what the entire educational system should do to facilitate learning. It is a subtle but important difference based on current research and understanding about teaching and learning.



The three parts of DSEI are illustrated here. The following are the critical functions of each part of the system. Think about where you, as a professional educator, fit into this system.

Six Elements of Organizational Leadership

- Create a culture of high expectations.
- Create a shared vision.
- Build leadership capacity.
- Align organizational structures and systems to vision.
- Align teacher/administrator selection, support, and evaluation.
- Support decision making with data systems.

Five Elements of Instructional Leadership

- Use research to establish urgency for higher expectations.
- Align curriculum to standards.
- Integrate literacy and math across all content areas.
- Facilitate data-driven decision making to inform instruction.
- Provide opportunities for focused professional collaboration and growth.

Six Elements of Teaching

- Embrace rigorous and relevant expectations for all students.
- Build strong relationships with students.
- Possess depth of content knowledge and make it relevant to students.
- Facilitate rigorous and relevant instruction based on how students learn.
- Demonstrate expertise in use of instructional strategies, technology, and best practices.
- Use assessments to guide and differentiate instruction.

When all parts of the system are working together efficiently, teachers receive the support they need, and students are successfully prepared for college, careers, and citizenship.

DSEI and Using Rigor and Relevance to Create Effective Instruction

The purpose of this handbook is to introduce and explain a strategy developed by the International Center for Leadership in Education. This strategy enables teachers to meet varying and changing educational priorities by focusing sharply on instruction that serves to heighten and concentrate rigorous learning and relevance in today's world.

The foundation of the program is the Rigor/Relevance Framework®, an easy-to-understand structure. It can be applied in the development of instruction and assessment and also used to measure progress toward increased rigor and relevance of classroom instruction.

Chapter 1: Rigor/Relevance Framework®

The Rigor/and Relevance Framework is a tool developed to examine curriculum, instruction, and assessment. This chapter describes its foundational ideas and explains how to read the framework and use it to develop and assess a curriculum.

Chapter 2: Planning Instruction

Traditional instructional planning begins with developing a curriculum, proceeds linearly to planning instruction that teaches the curriculum, and then develops a means of testing learning. This chapter describes a different approach to instructional planning for increased rigor and relevance.

Chapter 3: Enhancing Instructional Planning

This chapter describes a data-driven, four step method for instructional planning. Useful guidance and tools are presented to help apply the data to achieve a rigorous and relevant instructional plan. Checklists and data sources are provided and the use of instructional technology are addressed.

Chapter 4: Selecting and Developing Local Assessments

This chapter describes the different types of assessments and examines the relationship between assessments and the Rigor/Relevance Framework. It looks at ways of designing performance assessments and scoring guides.

Chapter 5: Teaching for Rigor and Relevance

This chapter describes 36 instructional strategies and how the Rigor/Relevance Framework can be used to choose those that are most suitable to learning objectives. It addresses ways for helping students apply reading strategies and ideas for building in more Quadrant D moments.

Chapter 6: Improving Instruction Through Rigor and Relevance

Methods to improve instruction are the focus of this chapter. Methods addressed include teacher reflection, the use of Internet resources for sharing ideas and acquiring information, peer review as an avenue for increasing the effectiveness of instruction, and personal improvement plans.

Chapter 1

Rigor/Relevance Framework®

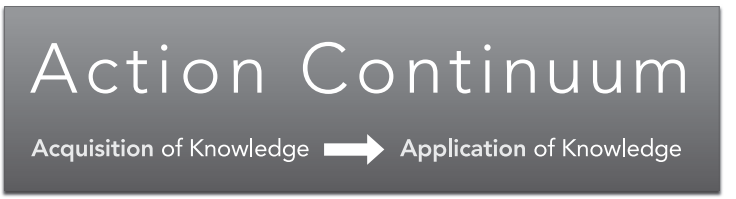
Introducing the Rigor/Relevance Framework®

The Rigor/Relevance Framework® is a tool developed by the International Center for Leadership in Education to examine curriculum, instruction, and assessment. The Rigor/Relevance Framework is based on the two dimensions of higher standards and student achievement.

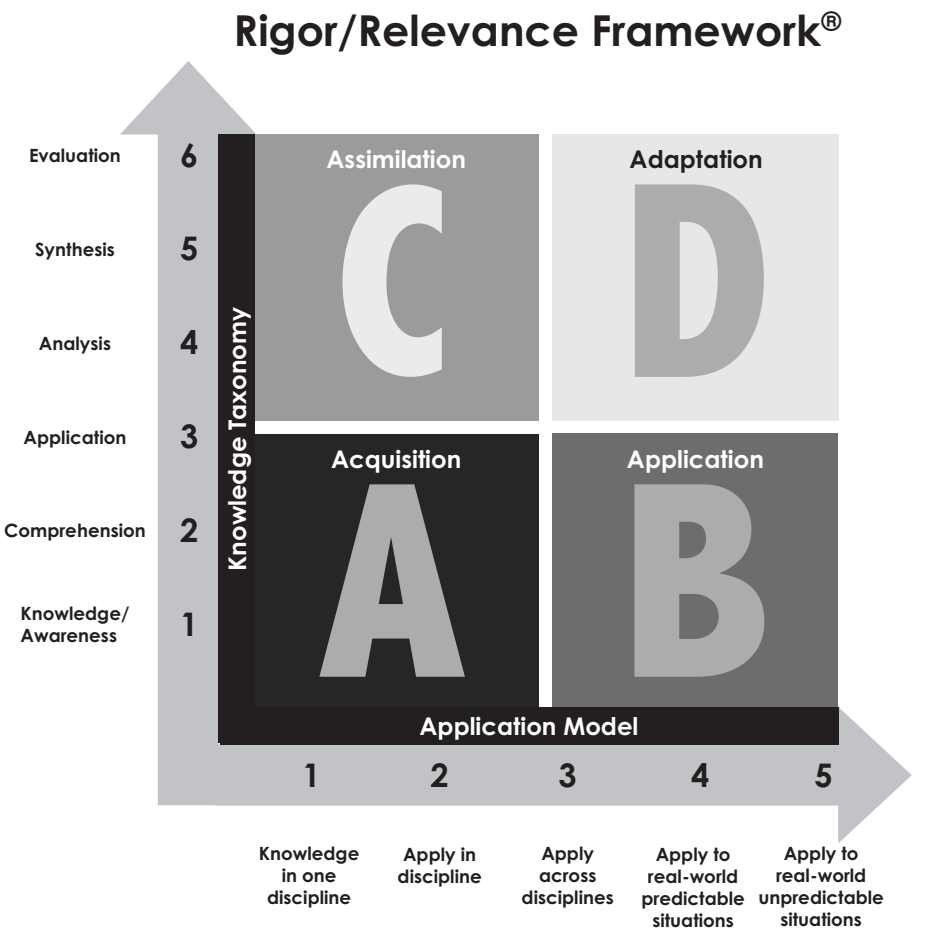
First, a continuum of knowledge describes the increasingly complex ways in which we think. This Knowledge Taxonomy is based on the six levels of Bloom's Taxonomy: (1) knowledge/awareness, (2) comprehension, (3) application, (4) analysis, (5) synthesis, and (6) evaluation. (Bloom, B.S., *et al*. *Taxonomy of Educational Objectives*)

The low end of this continuum involves acquiring knowledge and being able to recall or locate that knowledge in a simple manner. Just as a computer completes a word search in a word processing program, a competent person at this level can scan thousands of bits of information in the brain to locate that desired knowledge.

The high end of the Knowledge Taxonomy labels more complex ways in which individuals use knowledge. At this level, knowledge is fully integrated into one's mind, and individuals can do much more than locate information — they can take several pieces of knowledge and combine them in both logical and creative ways. Assimilation of knowledge is an accurate way to describe this high level of the thinking continuum. Assimilation is often a higher-order thinking skill: at this level, the student can solve multi-step problems, create unique work, and devise solutions.



The second continuum, created by Willard Daggett, is known as the Application Model. The five levels of this continuum are (1) knowledge in one discipline, (2) apply in discipline, (3) apply across disciplines, (4) apply to real-world predictable situations, and (5) apply to real-world unpredictable situations. The Application Model describes putting knowledge to use. While the low end is knowledge acquired for its own sake, the high end signifies action — use of that knowledge to solve complex real-world problems and create projects, designs, and other works for use in real-world situations.



The Rigor/Relevance Framework has four quadrants.

Quadrant A represents simple recall and basic understanding of knowledge for its own sake. Quadrant C represents more complex thinking but still knowledge for its own sake. Examples of Quadrant A knowledge are knowing that the world is round and that Shakespeare wrote *Hamlet*.

Quadrant C embraces higher levels of knowledge, such as knowing complex math and science, analyzing literature, and examining the benefits and challenges of the cultural diversity of this nation versus other nations.

Quadrants B and D are based on action or high degrees of application. Quadrant B includes knowing how to use math skills to make purchases and count change or how to perform physical tasks in art or music. Applying knowledge from a variety of sources to solve complex problems and creating real-world products are types of Quadrant D learning.

Each of these four quadrants can also be labeled with a term that characterizes the learning or student performance.

Quadrant A — Acquisition

Students gather and store bits of knowledge and information. Students are primarily expected to remember or understand this acquired knowledge.

Quadrant B — Application

Students use acquired knowledge to solve problems, design solutions, and complete work. The highest level of application is to apply appropriate knowledge to new and unpredictable situations.

Quadrant C — Assimilation

Students extend and refine their acquired knowledge to automatically and routinely analyze and solve problems as well as create unique solutions.

Quadrant D — Adaptation

Students have the competence to think in complex ways and apply knowledge and skills they have acquired. Even when confronted with perplexing unknowns, students are able to use extensive knowledge and skill to create solutions and take action that further develops their skills and knowledge.

The following is an example involving technical reading and writing.

- **Quadrant A:** Define vocabulary terms needed to understand content of a classroom simulation.
- **Quadrant B:** Complete a simulation following the directions given by the instructor.
- **Quadrant C:** Compare and contrast the information gained from two simulations with that gained from reading a text on the same topic.
- **Quadrant D:** Synthesize information from a range of sources (e.g., texts, media sources, simulations), presenting solutions to conflicting information.

A Fresh Approach

The Rigor/Relevance Framework is a fresh approach to looking at curriculum standards and assessment. It is based on traditional elements of education yet encourages movement from acquisition of knowledge to application of knowledge.

The framework is easy to understand. With its simple, straightforward structure, it can serve as a bridge between the school and the community. It offers a common language with which to express the notion of a more rigorous and relevant curriculum and encompasses much of what parents, business leaders, and community members want students to learn. The framework is versatile; it can be used in the development of instruction and assessment. Likewise, teachers can measure their progress in adding rigor and relevance to instruction and select appropriate instructional strategies to meet learner needs and higher achievement goals.

Defining Rigor

Rigor refers to academic rigor — learning in which students demonstrate a thorough, in-depth mastery of challenging tasks to develop cognitive skills through reflective thought, analysis, problem solving, evaluation, or creativity. Rigorous learning can occur at any school grade and in any subject.

A versatile way to define the level of rigor of curriculum objectives, instructional activities, or assessments is the Knowledge Taxonomy Verb List. This list can be used either to create a desired level of expected student performance or to evaluate the level of existing curriculum, instruction, or assessment.

Knowledge Taxonomy Verb List

Quadrant A	Quadrant B	Quadrant C	Quadrant D
calculate	adjust	analyze	adapt
choose	apply	categorize	compose
count	build	classify	conclude
define	collect	compare	create
describe	construct	conclude	design
find	demonstrate	contrast	develop
identify	display	debate	discover
label	dramatize	defend	explore
list	draw	diagram	formulate
locate	fix	differentiate	invent
match	follow	discriminate	modify
memorize	illustrate	evaluate	plan
name	interpret	examine	predict
point to	interview	explain	prioritize
recall	look up	express	propose
recite	maintain	generate	rate
record	make	infer	recommend
say	measure	judge	revise
select	model	justify	teach
spell	operate	prove	
view	play	research	
	practice	study	
	produce	summarize	
	relate		
	role play		
	sequence		
	show		
	solve		
	tune		
	use		

An example of student performance at various levels follows. Notice each statement starts with a verb that comes from the appropriate section of the Knowledge Taxonomy Verb List.

The expected achievement level for teaching about nutrition can vary depending on the purpose of the instruction. If a teacher only wants students to acquire basic nutritional knowledge, a student performance set at level one or two is adequate. If the instruction is intended to have a more significant impact on nutritional habits, then some of the objectives need to be similar to levels four through six.

Basic Nutrition

Level	Performance
1 Knowledge/Awareness	Label foods by nutritional groups.
2 Comprehension	Explain nutritional value of individual foods.
3 Application	Make use of nutritional guidelines when planning meals.
4 Analysis	Examine success in achieving nutritional goals.
5 Synthesis	Develop personal nutritional goals.
6 Evaluation	Appraise results of personal eating habits over time.

Note that each of the levels requires students to think differently. Levels four through six require more complex thinking than levels one through three.

When creating lesson plans and student objectives, select the proper word from the Knowledge Taxonomy Verb List to help describe the appropriate performance. Simply start with a verb from the desired level and finish the statement with a specific description of that skill or knowledge area.

The verb list can also be used to evaluate existing lesson plans, assessments, and instructional experiences. Looking for verbs and identifying their level gives a good indication of the level of student performance in that instruction.

Multiple Knowledge Taxonomies

The Knowledge Taxonomy by Bloom was the first to define levels of cognition. (Anderson, L. W. and. Krathwohl, D. R., (eds.) *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*) Over the years, several modifications have been made to this original taxonomy.

In 2001 Bloom's Knowledge Taxonomy was updated and revised by Lorin Anderson, a student of Bloom's, and David Krathwohl, a colleague, to reflect the movement to standards-based curricula and assessment. Nouns in Bloom's original model were changed to verb forms (for example, *knowledge* to *remembering* and *comprehension* to *understanding*) and slightly reordered. We believe that the original Bloom's Taxonomy as shown in our Rigor/Relevance Framework clearly describes expectations for Quadrants A, B, C, and D. The revised Bloom's elevates the importance of Quadrants B and D and indicates how 21st-century lessons should be built. We regard both the original and revised taxonomies as necessary and important.

A more recent revision of a knowledge taxonomy is Webb's Depth of Knowledge. (Webb, Norman L., *et al.* "Web Alignment Tool") Several state test development departments have adopted the Depth of Knowledge framework because it focuses on the expectations made of a test item, not on the ability of the student. When classifying an item's demands on thinking (i.e., what the item requires the student to recall,

understand, analyze, and do), it is assumed that the student is already familiar with the basic concepts of the task.

The National Assessment of Educational Progress (NAEP) uses individual cognitive categories that are a variation of Bloom, Webb, or those that simply have a complexity level of low, moderate, or high.

Marzano describes four levels of the cognitive system: knowledge retrieval, comprehension, analysis, and knowledge utilization. Knowledge utilization is a high-level cognitive function in Marzano's scheme since it reflects decision making, problem solving, and experimentation. (Marzano R.J., and Kendall, J.S. *Designing and Assessing Educational Objectives*)

Marzano also adds two levels of thinking beyond the four that comprise the cognitive system: metacognitive (level 5) and self-system (level 6). Metacognition refers to "thinking about thinking." At this level students reflect on the quality of their thoughts and improve over time. The additional category of self-system resolves a paradox in Bloom's Taxonomy wherein the evaluation level students both judge the high-quality work of others and reflect on their own thinking and work. Self-system describes the obvious thinking that students use even to engage in a cognitive activity. This thinking includes making connections with emotions, self-regulation, and focus.

Cross Reference of Knowledge Taxonomies

Bloom Knowledge Taxonomy	Anderson Revised Knowledge Taxonomy	Webb Depth of Knowledge	Marzano New Taxonomy of Educational Objectives
Knowledge	Remember	Recall	Knowledge Retrieval
Comprehension	Understand		Comprehension
Application	Apply	Basic Application of Skill/Concept	
Analysis	Analyze	Strategic Thinking	Analysis
Synthesis			Knowledge Utilization
Evaluation	Evaluate	Extended Thinking	
	Create		

LOW RIGOR

HIGH RIGOR

The other differentiation of levels reflects the nature of what students are thinking. In Bloom's original work, he described three types of knowledge — factual, conceptual, and procedural — but these were never given much attention. Marzano built upon the revised Bloom's Knowledge Taxonomy by adding a cross-reference between the taxonomy verbs as a cognitive process (ways students use knowledge) and the domains of knowledge (types of knowledge students use). Marzano revised the types of knowledge to information, mental procedures, and psychomotor procedures. (The aspect of different learning objectives is discussed in Chapter 2.)

With several cognitive taxonomies now in use, a natural question is whether these new taxonomies make the Rigor/Relevance Framework obsolete. The answer is "No." We continue to use Bloom's original taxonomy since it is so well known. Actually, the Rigor/Relevance Framework is flexible enough to use with any cognitive taxonomy. The common characteristic is low and high rigor as shown in the Cross-Reference of Knowledge Taxonomies table.

Erickson has clarified the type of learning into hierarchical learning with generalizations being the highest type of learning (Erickson, H. Lynn. *Concept Based Curriculum and Instruction for the Thinking Classroom*):

- Topics/facts: This category of study implies a body of related facts to be learned. A study that is focused on topics and facts alone, without the use of a conceptual lens, results in memorization and surface understanding rather than integrated thinking and deeper understanding.
- Concepts: One- or two-word concepts are abstract, timeless, and universal. Concepts may be very broad macro concepts, such as change, system, or interdependence, or they may be more topic specific, such as organism, habitat, or government.
- Generalizations: This involves two or more concepts stated as a relationship; it involves understanding the "big ideas" as they are related to the critical concepts and topics of a study.

Thus the highest level of student learning is for students to understand concepts and think at high levels of rigor.

Defining Relevance

Relevance refers to learning in which students apply core knowledge, concepts, or skills to solve real-world problems. Relevant learning is interdisciplinary and contextual. Student work can range from routine to complex at any school grade and in any subject. Relevant learning is created, for example, through authentic problems or tasks, simulation, service learning, connecting concepts to current issues, and teaching others.

Identifying the level of relevance of curriculum objectives and instructional activities is a little more difficult than determining the Knowledge Taxonomy level because no verb exists. However, just as the Knowledge Taxonomy categorizes increasing levels of thinking, the Application Model describes increasingly complex applications of knowledge. Any student performance can be expressed as one of five levels of the Application Model. The Application Model Decision Tree can assist in setting the desired level of expected student performance in application.

The basic nutrition example that follows is similar to the example in "Defining Rigor" that uses nutrition to describe student performance at various levels. Each level requires students to apply knowledge differently.

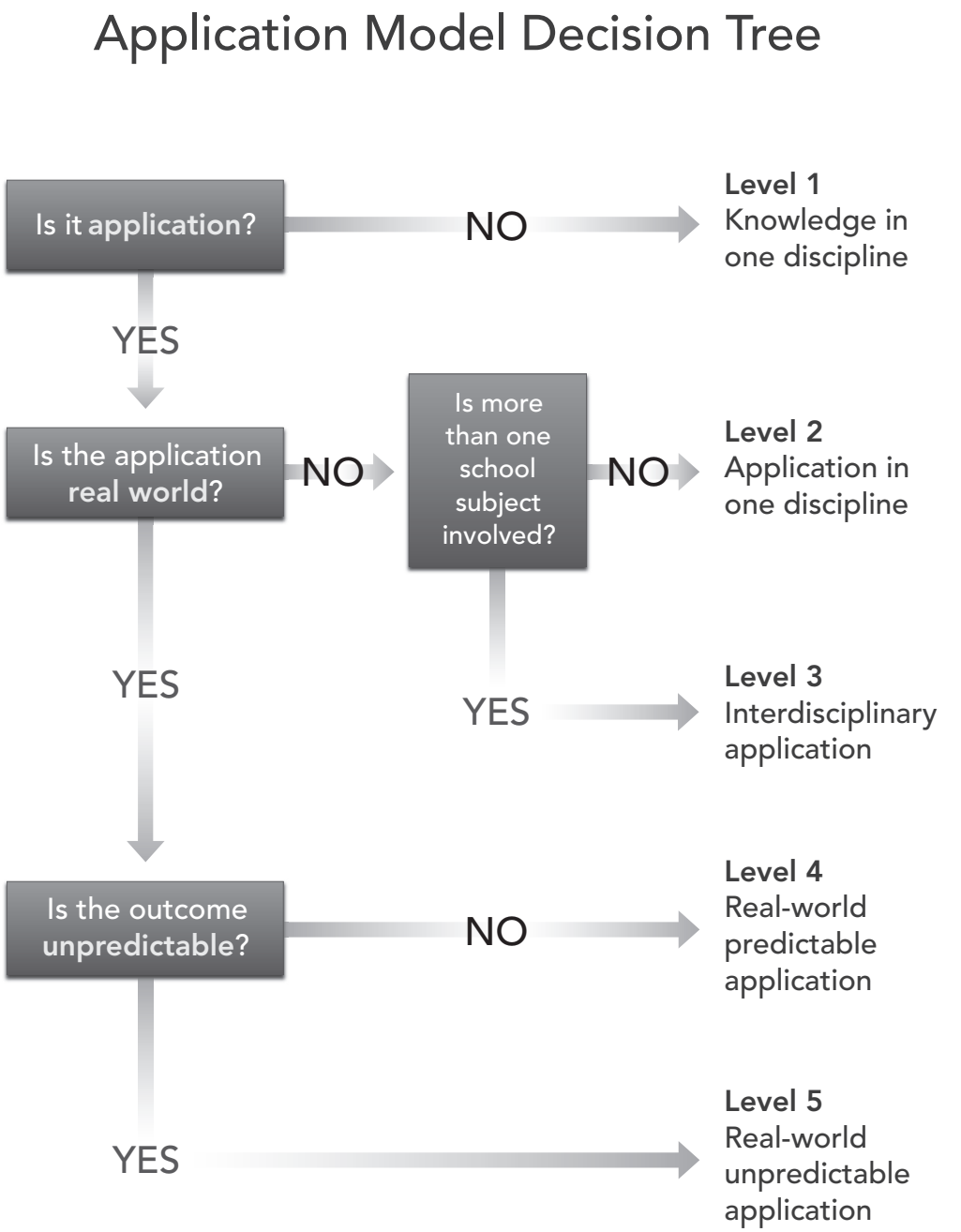
Basic Nutrition

Level	Performance
1 Knowledge in One Discipline	Label foods by nutritional groups.
2 Application in One Discipline	Rank foods by nutritional value.
3 Interdisciplinary Application	Make cost comparisons of different foods considering nutritional value.
4 Real-World Predictable Situations	Develop a nutritional plan for a person with a health problem affected by food intake.
5 Real-World Unpredictable Situations	Devise a sound nutritional plan for a group of 3-year-olds who are picky eaters.

Similarly, the expected achievement level for teaching about nutrition can vary depending on the purpose of the instruction. If a teacher wants students only to acquire basic nutritional knowledge, a student performance set at level one is adequate. If the instruction is intended to have a significant impact on nutritional habits, then some of the objectives need to be at levels 4 and 5.

Application Model Decision Tree

Directions: Select a task, application, or activity and then answer the following questions. See next page for clarification of the questions.



Application Model Decision Tree

Directions: Use the following statements to clarify where a task, application, or assessment belongs on the Application Model.

Application Model Decision Tree

Is it application?

YES

Requires use of knowledge

Requires students to actually use practice steps in a procedure

Uses previous knowledge to solve problems, create a design, or communicate information

Asesses performance

NO

Requires only recall or understanding

Requires learning steps in a procedure

Requires memorization of facts or formulas

Assess content knowledge

Is the application real world?

YES

Application occurs in same way it is used by adults

Standards for performance are same as for adult roles

Students have access to real-world resources (tools, references, etc.)

Task must be completed in same time frame as real-world

NO

Application occurs only in school

Lower standards of performance are acceptable

Resources are limited

Students have extended time to complete the task

Is the outcome unpredictable?

YES

Application has uncertain results

Unknown factors involved (environment, people, time)

Students have individual and unique solutions to problems

NO

Application involves routine solution

Parameters are controlled

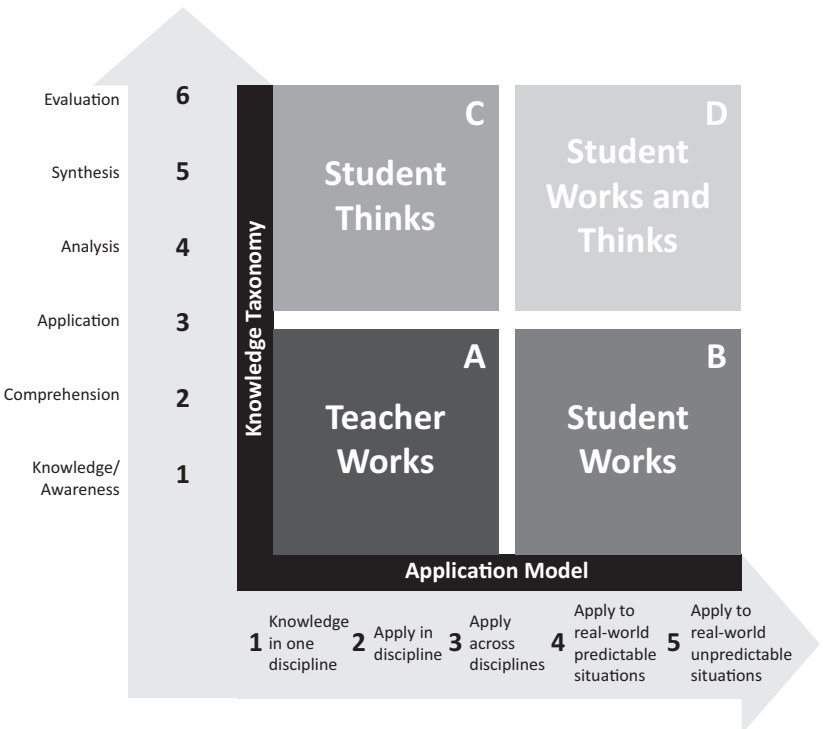
All students complete similar designs or solutions

Use the Application Model Decision Tree to help describe desired performance. Start by writing draft statements of student objectives, and then use the Decision Tree to reflect on and revise these statements. The Decision Tree focuses on the three key characteristics that distinguish levels of the Application Model: application, real world, and unpredictability. The second page of the Decision Tree offers additional criteria to determine whether an objective meets the test of application, real world, and unpredictability.

The Application Model Decision Tree can also be used to evaluate existing lesson plans, assessments, and instructional experiences. Answer the questions to identify the level of student performance for the instruction or assessment.

Teacher/Student Roles

One way to think about the Rigor/Relevance Framework in day-to-day instruction is in terms of the roles that teachers and students take. These roles are represented in the following figure. When instruction and expected student learning is in Quadrant A, the focus is on "teacher work." Teachers expend energy to create and assess learning activities — providing information, creating worksheets, and grading student work. The student is often a passive learner.



When the student expectation moves to Quadrant B, the emphasis is on the student doing real-world work. This student work is often more complicated than Quadrant A work and requires more time. Learning in Quadrant B is best described as "student work" because students are doing extensive real-world tasks.

When the learning is placed in Quadrant C, it is best described as "student think." In this quadrant, the student is expected to think in complex ways.

Rigor and Relevance in the Classroom

Curriculum/Instruction/Assessment Checklists

Once you are familiar with the Knowledge Taxonomy and the Application Model, you can evaluate existing curriculum objectives, instructional activities, and assessments or commercial materials to determine the levels of rigor and relevance. You can also create curriculum objectives, instructional activities, and assessments with the level of rigor and relevance you desire.

One of the principles of effective learning is congruence among curriculum, instruction, and assessment. Make sure that the levels of rigor and relevance are consistent throughout a lesson. For example, if a teacher has lofty curriculum objectives in Quadrant D (high rigor/high relevance) but develops instruction in Quadrant A (low rigor/low relevance), students are unlikely to achieve those high expectations. Similarly, if a teacher creates high-rigor instructional activities but uses a low-rigor assessment, the test is not an accurate indication of what students have learned.

Use the Knowledge Taxonomy Verb List and the Application Model Decision Tree to draft, examine, and modify curriculum objectives, instructional activities, or assessments and place them at the desired level. The Verb List gives you verbs to expand into objectives or test questions. The Application Model Decision Tree helps you categorize draft objectives or test questions.

The three-part Rigor and Relevance in Curriculum/Instruction/Assessment Checklist that follows can help you review your lesson plan to determine if it is at the desired level.

Rigorous and Relevant Instruction Rubric

Increasing the rigor and relevance of instruction is not a quick change but more a gradual evolution over time. A helpful tool to move to higher levels of rigor and relevance is an instructional rubric. The Rigorous and Relevant Instruction Rubric that follows defines five levels that focus on attaining an ideal level of high rigor and relevance. Rigor includes three essential criteria: thinking, verbal responses, and work. Relevance includes three essential criteria: work, resources, and assessment.

Rigor and Relevance in Curriculum/Instruction/ Assessment Checklist

Curriculum Objectives

Quadrant A — Acquisition (Low Rigor/Low Relevance)

☐ Yes ☐ No Use verbs synonymous with recall and understanding

☐ Yes ☐ No Call for the explanation of knowledge or skill but not application

☐ Yes ☐ No Are limited to a single discipline

☐ Yes ☐ No Are basic foundation skills

Quadrant B — Application (Low Rigor/High Relevance)

☐ Yes ☐ No Use verbs synonymous with recall, understanding, or application

☐ Yes ☐ No Call for the application of knowledge to real-world problems

☐ Yes ☐ No Are interdisciplinary in nature

☐ Yes ☐ No Are routine and practical — they follow the steps

Quadrant C — Assimilation (High Rigor/Low Relevance)

☐ Yes ☐ No Use verbs synonymous with application, analysis, synthesis, or evaluation

☐ Yes ☐ No Call for the explanation of knowledge or skill but not real-world application

☐ Yes ☐ No Are limited to a single discipline

☐ Yes ☐ No Are complex and theoretical

Quadrant D — Adaptation (High Rigor/High Relevance)

☐ Yes ☐ No Use verbs synonymous with analysis, synthesis, or evaluation

☐ Yes ☐ No Call for the application of knowledge to real-world problems

☐ Yes ☐ No Are interdisciplinary in nature

☐ Yes ☐ No Are complex and practical

Rigor and Relevance in Curriculum/Instruction/ Assessment Checklist

Instructional Activities

Quadrant A — Acquisition (Low Rigor/Low Relevance)

☐ Yes ☐ No Use verbs synonymous with recall and understanding

☐ Yes ☐ No Call for the explanation of knowledge or skill but not application

☐ Yes ☐ No Focus is primarily on the teacher

☐ Yes ☐ No Require all students to complete the same work, usually at same time and speed

Quadrant B — Application (Low Rigor/High Relevance)

☐ Yes ☐ No Use verbs synonymous with recall, understanding, or application

☐ Yes ☐ No Call for the application of knowledge to real-world problems

☐ Yes ☐ No Allow students to work at independent speed

☐ Yes ☐ No Require all students to complete the same work

Quadrant C — Assimilation (High Rigor/Low Relevance)

☐ Yes ☐ No Use verbs synonymous with analysis, synthesis, or evaluation

☐ Yes ☐ No Call for explanation of knowledge or skill but not real-world application

☐ Yes ☐ No Focus primarily on the student

☐ Yes ☐ No Require original student work

Quadrant D — Adaptation (High Rigor/High Relevance)

☐ Yes ☐ No Use verbs synonymous with analysis, synthesis, or evaluation

☐ Yes ☐ No Call for the application of knowledge to real-world problems

☐ Yes ☐ No Require original student work

☐ Yes ☐ No Are complex tasks requiring students to work independently of the teacher

Rigor and Relevance in Curriculum/Instruction/ Assessment Checklist

Assessments

Quadrant A — Acquisition (Low Rigor/Low Relevance)

☐ Yes ☐ No Use verbs synonymous with recall and understanding

☐ Yes ☐ No Call for explanation of knowledge or skill but not application

☐ Yes ☐ No Are multiple choice, true/false, or short answer

☐ Yes ☐ No Require a single standard answer

Quadrant B — Application (Low Rigor/High Relevance)

☐ Yes ☐ No Use verbs synonymous with recall, understanding, or application

☐ Yes ☐ No Call for the application of knowledge to real-world problems

☐ Yes ☐ No Are performance-based

☐ Yes ☐ No Follow a routine or set procedure

Quadrant C — Assimilation (High Rigor/Low Relevance)

☐ Yes ☐ No Use verbs synonymous with analysis, synthesis, or evaluation

☐ Yes ☐ No Call for the explanation of knowledge or skill but not real-world application

☐ Yes ☐ No Include multi-step problems

☐ Yes ☐ No Are essays, presentations, or portfolios

Quadrant D — Adaptation (High Rigor/High Relevance)

☐ Yes ☐ No Use verbs synonymous with analysis, synthesis, or evaluation

☐ Yes ☐ No Call for unique solutions in applying knowledge to real-world problems

☐ Yes ☐ No Are performance-based

☐ Yes ☐ No Include multi-step problems

Collaborative Instructional Review — Classroom Visitation Rubric for Rigor

Evidence of Rigor	Beginning	Developing	Meeting	Exceeding
Thoughtful Work	Student work is easy, usually only requiring a single correct answer.	Student work occasionally requires extended time to complete, stretches student learning, and requires use of prior knowledge.	Student work requires extensive use of prior knowledge, is frequently creative and original, and requires students to reflect and revise for improved quality.	Student work requires extensive creativity, originality, design, or adaptation.
High-Level Thinking	Student work requires simple recall of knowledge.	Student work requires explanation and understanding of knowledge and/or limited application. Students occasionally use higher order thinking skills.	Students demonstrate higher order thinking skills, such as evaluation, synthesis, creativity, and analysis. Students evaluate their own work and identify steps to improve it.	Students routinely use higher order thinking skills, such as evaluation, synthesis, creativity, and analysis. Students skillfully evaluate their own work and the work of others.
Oral Extended Student Responses	Students' oral responses demonstrate simple recall and basic understanding of knowledge as evidenced by single word responses or recital of facts.	Students' oral responses demonstrate comprehension by explaining information in their own words, and occasionally expressing original ideas and opinions. Students participate in discussions with peer groups.	Students' oral responses demonstrate an ability to extend and refine knowledge automatically, to solve problems routinely, and to create unique solutions. Students are able to facilitate class discussions.	Students' oral responses demonstrate logical thinking about complex problems, and the ability to apply prior knowledge and skills when confronted with perplexing unknowns. Students are skillful in discussions with peers and adults.

Collaborative Instructional Review — Classroom Visitation Rubric for Relevance

Evidence of Relevance	Beginning	Developing	Meeting	Exceeding
Meaningful Work	Student work is routine and highly structured, reflects knowledge in one discipline, and usually requires the memorization of facts and formulas or an assessment of content knowledge.	Student work is structured, reflects a basic application of knowledge, and occasionally, interdisciplinary applications. Students practice using the steps in a procedure and previous knowledge to solve problems and create solutions.	Student has choices for work that is challenging, often original, reflects application of knowledge, and requires performance, consistent with real-world applications.	Student work reflects real-world unpredictable applications of knowledge that have unknown factors, and individual and unique solutions to problems.
Authentic Resources	Students rely on the teacher as their primary resource to complete work.	Students use and rely on the teacher as their primary resource but also use textbooks, references, and secondary reading material to complete work.	Students use real-world resources such as manuals, tools, technology, primary source documents, and/or interviews to complete work.	Students select and use multiple real-world resources, as well as new or unique resources, perhaps unknown to teacher.
Learning Connections	Students see learning only as a school requirement unrelated to their future or their outside lives.	Students begin to see connections between their learning and their lives as it relates to personal examples and applications to solve problems.	Students see connections between what they are learning and their lives, and can make links to real-world applications.	Students are committed to the learning experience as something that is an essential part of meeting their future goals and life aspirations.

Verb List by Rigor/Relevance Quadrant

- Verbs are not always an absolute indicator of the level of rigor and relevance. Also consider the context and work in which students are engaged when determining the level of rigor and relevance.
- Verbs are listed where they are used most frequently.

C

analyze
categorize
classify
compare
conclude
contrast
debate
defend
diagram
differentiate
discriminate
evaluate
examine
explain
express
generate
infer
judge
justify
prove
research
study
summarize

D

adapt
compose
conclude
create
design
develop
discover
explore
formulate
invent
examine
explain
express
modify
plan
predict
prioritize
propose
rate
recommend
revise
teach

A

calculate
choose
count
define
describe
find
identify
label
list
locate
match
memorize
name
point to
recall
recite
record
say
select
spell
view

B

adjust
apply
build
collect
construct
demonstrate
display
dramatize
draw
fix
follow
illustrate
interpret
interview
look up
maintain
make
measure
model
operate
play
practice
produce
relate
role play
sequence
show
solve
tune
use

Product List by Quadrant

One way to identify the current levels of rigor and relevance as well as raise those levels is to reflect on the verbs used in test questions and the products that comprise student work. The following is a list of products linked to each quadrant. These products are not always perfect indicators of the level of rigor and relevance, but they often can be used to identify the level.

- Products listed in each quadrant are the typical products that students use to demonstrate learning in each quadrant. Also consider the context and work that students are engaged in when determining the level of rigor and relevance.
- Some products can be used in multiple quadrants.
- Products are listed where they are used most frequently.

C

abstract
annotation
blog
chart
classification
debate
essay
evaluation
exhibit
inventory
investigation
journal
outline
plan
report

D

adaptation
blueprint
book
brochure
debate
device
editorial
estimation
invention
lesson
model
new
game
newspaper
play
poem
song
trial
video
website
wiki

A

definition
explanation
list
quiz
answer
recitation
true/false
selection
reproduction
workbook
worksheet

B

collage
scrapbook
collection
data
set
demonstration
interpretation
notes
painting
performance
service
skit
solution
survey

Learning Experiences in the Rigor/Relevance Framework

The following charts provide examples of learning experiences to help you further understand the types of learning that can take place in each of the four quadrants of the Rigor/Relevance Framework. The charts cover most subjects at the elementary, middle, and high school levels.

As a general rule:

Quadrant A — Acquisition

Experiences focus on recall or discovery of basic knowledge.

Quadrant B — Application

Experiences provide definite opportunities for students to apply knowledge, typically to a real-world problem.

Quadrant C — Assimilation

Experiences are often complex and require students to devise solutions frequently, which can lead to deeper understanding of concepts and knowledge.

Quadrant D — Adaptation

Experiences are high in rigor and relevance and often require unique solutions to unpredictable problems.

Learning Experiences in the Rigor/Relevance Framework

English Language Arts

Elementary Examples

Quadrant C Assimilation

6
- Give and seek constructive feedback in order to improve writing.
- Compare similar words to describe objects.

5
- Develop a WebQuest on learning language skills.
- Brainstorm as many words as possible to describe an object.

4
- Create and decipher coded messages.
- Describe mystery objects to partners to strengthen use of descriptions.
- Create word puzzles.

3

Quadrant D Adaptation

- Create new words to describe phenomena or objects.
- Publish a brochure.
- Design and create objects related to a children's book.
- Plan a family vacation.
- Research an issue and write a letter to the school board, elected official, or local newspaper.

Quadrant A Acquisition

2
- Create a drawing, picture, sign, or other graphic to represent a word or concept.
- Put words together in sentence format.

1
- Retell stories.
- Respond to oral directions.
- Participate in word games.
- Develop outlines from a nonfiction presentation.
- Memorize spelling words.
- Create a list of commonly misspelled words.

Quadrant B Application

- Use job-related tools or clothing to stimulate writing and drawing about a career.
- Read and share content of local newspaper.
- Present a story through a computer graphics application.
- Communicate with e-mail pals in another country.
- Search newspapers for abbreviations and acronyms.
- Write factual stories about personal experiences.
- Role play stories.
- Write a poem about yourself.

1 2 3 4 5

Learning Experiences in the Rigor/Relevance Framework

English Language Arts

Middle Level Examples

Quadrant C Assimilation

- Play word games to identify specific language usage, such as figurative language.
- Research the history of words and phrases.
- Keep a journal of reflection on literature.
- Write a creative story, such as surviving in the wilderness.
- Create analogies to explain an idea.
- Analyze commercials for fact and opinion.
- Analyze a character in a novel.
- Create a new character in mythology.

Quadrant D Adaptation

- Create a Bill of Rights for your school or classroom.
- Write directions for assembling a product or carrying out a procedure.
- Create a rubric for evaluating writing assignments.
- Research and debate a controversial issue.
- Write a folk tale based on contemporary life.
- Analyze and rewrite political cartoons.

Quadrant A Acquisition

- View movies that depict human emotions and behaviors.
- Label parts of speech in sentences.
- Look up the definition of the "word of the day."
- Use library reference tools.
- Give oral directions.
- Read nonfiction or historical literature.
- Locate and describe technical writing.

Quadrant B Application

- Conduct an interview.
- Conduct a meeting using parliamentary procedure.
- Conduct an Internet search.
- Write captions for cartoons.
- Lead a class discussion on a current event.
- Assemble a product following written directions.
- Write articles and headlines for a class newsletter.
- Act out characters in a story.

6 5 4 3 2 1

1 2 3 4 5

Learning Experiences in the Rigor/Relevance Framework

English Language Arts

High School Examples

Quadrant C Assimilation

- Compare and contrast literary styles of different authors.
- Relate literature to historical context.
- Discuss the role of media in a democracy.
- Research limits of First Amendment freedoms.
- Analyze characters from a novel.
- Create a storyboard.
- Analyze and improve typical student writing.
- Role play characters from literature in new situations.
- Write a research report on a national problem.

Quadrant D Adaptation

- Write and perform a radio play.
- Simulate a presidential debate.
- Write a legal brief defending a school policy.
- Prepare a demonstration video.
- Review newspaper editorials for a week and write a letter to the editor expressing an opinion in response to one of them.
- Develop guidelines for publishing content on Internet pages.
- Develop a reading list of historical biographies for a middle-level social studies course.
- Debate a current political issue.

Quadrant A Acquisition

- Practice SAT vocabulary words.
- Select books and read to younger children.
- Read important works of literature.
- Give an extemporaneous speech.
- Learn several graphic organizers.
- Use word processing outlining and table tools.
- Write an essay on an historical topic.

Quadrant B Application

- Role play a scene from Shakespeare.
- Identify and analyze typical body language traits.
- Create a personal or class website.
- Research a career field.
- Use word processing software to write a business letter.
- Prepare a multimedia presentation.

6 5 4 3 2 1

1 2 3 4 5

Learning Experiences in the Rigor/Relevance Framework

Mathematics	Elementary Examples

Quadrant C Assimilation

6
- Predict and analyze patterns of sides of three-dimensional boxes.
- Use pattern blocks to construct desired shapes.

5
- Identify next numbers in a sequence.
- Find values in number sentences when represented by unknowns.
- Round off numbers and estimate answers.

4
- Use a balance to predict and determine equivalent value.
- Create math word problems for younger students.

Quadrant D Adaptation

- Develop formula for determining a large quantity without counting, such as beans in a jar.
- Calculate change of values to double or halve a recipe.
- Discover similar characteristics of different geometric solids.
- Collect data on an event and compare to expected results (e.g., the number of faulty parts manufactured).
- Evaluate situations when estimates are acceptable and unacceptable.
- Create a measurement scale (e.g., hand span, book, length of string) and measure objects in classroom.

3

Quadrant A Acquisition

- Explore likenesses and differences of objects (color, shape, size).

2
- Sort and classify objects, such as buttons, blocks, and bottle tops.
- Use color counters to solve simple computational problems.
- Divide objects to illustrate whole, half, third, and quarter.

1
- Construct shapes and patterns with craft sticks.
- Memorize multiplication tables.
- Find the lines of symmetry in letters of the alphabet and numerals.
- Use pegboards to discover multiplied values.

Quadrant B Application

- Divide quantities of objects into equal groups.
- Calculate the area of objects.
- Make a graph comparing characteristics of two groups.
- Find patterns outdoors and indoors.
- Collect temperatures at different times of day for several days and make a graph to display recorded data.
- Use rulers to measure objects.
- Sort quantities to discover fractions of the whole.

1 2 3 4 5

Learning Experiences in the Rigor/Relevance Framework

Mathematics	Middle Level Examples

Quadrant C Assimilation

6
- Measure interior angles of polygons and discover the relationship between number of sides and sum of angles.
- Graph the perimeters and areas of squares of different sizes.

5
- Express probabilities as fractions, percents, or decimals.
- Evaluate equivalency and the relationship of decimal and fractions.
- Determine the largest area for a fixed perimeter.

4
- Fill in missing numbers for ordered pairs for an algebraic function.
- Evaluate objects for similarity and congruence.
- Estimate sums of complex fractions.

3

Quadrant D Adaptation

- Hold a competition to determine when using a calculator or doing mental math is most efficient.
- Obtain historical data about local weather to estimate amount of snow, rain, or sun during a given season of the current year.
- Use graphing calculators and computer spreadsheets to organize and analyze data.
- Test consumer products, such as absorbency of paper towels, devise a scale, and illustrate data graphically.
- Plan a large school event and calculate resources (e.g., food, decorations) needed and costs.

Quadrant A Acquisition

- Select computational operation to solve word problems.

2
- Calculate volume of regular solids.
- Measure angles with a protractor.
- Find and measure the sides and angles of a right triangle using the Pythagorean theorem and trigonometric ratios.

1
- Organize and display collected data, using tables, charts, or graphs.
- Use basic properties of equality to solve equations with one variable.
- Plot the coordinates for quadrilaterals on a grid.

Quadrant B Application

- Make a scale drawing of the classroom.
- Calculate percents of daily requirements met through a typical school lunch.
- Calculate potential combinations of a group of variables, such as wardrobe components, and estimate the probability of any one combination being picked at random.
- Calculate percentages of advertising in a newspaper.
- Play a simulated baseball game and calculate statistics.
- Calculate paint needed for a summer business painting houses.

1 2 3 4 5

Learning Experiences in the Rigor/Relevance Framework

Mathematics	High School Examples

Quadrant C Assimilation

6
- Solve interdisciplinary problems with signed numbers, such as molecules with a charge of protons and electrons.
- Identify congruence of shapes from expressions and truth statements.

5
- Complete Euclidean proofs in geometry.
- Construct truth tables as a shorthand method for discussing logical sentences.
- Analyze factors in difference between theoretical empirical probability.

4
- Select best measures of central tendency to support a particular point of view.
- Solve quadratic equations and linear inequalities.

3

Quadrant D Adaptation

- Determine types of measurements/ calculations involved in designing everyday items.
- Make calculations of electrical load of appliances based on usage in homes in the community.
- Examine the different elements, visual effects, and features found in a computer game, and use mathematics to design some of these elements.
- Create formulas to predict changes in stock market values.
- Design support posts of different materials and size to handle stress load in a building.
- Develop a sampling plan for a public opinion poll.
- Design a roller coaster ride.

Quadrant A Acquisition

- Distinguish rational from irrational numbers.
- Simplify, factor, and compute polynomials.

2
- Solve and graph linear equations.
- Create and solve factorial expressions for permutation problems.
- Construct and solve for unknowns in ratio problems.

1
- Compute numbers with scientific notation.
- Predict the probability of events using ratios.
- Bisect line segments and angles.
- Provide examples to illustrate properties of real numbers.

Quadrant B Application

- Draw Venn diagrams to represent a set of real conditions (e.g., common characteristics of students in class).
- Find length of line segments without measuring.
- Take measurements using calipers and micrometers.
- Calculate measurement error in real observations.
- Calculate frequency of vibration of various piano strings.
- Calculate medical dosages for different weight animals.
- Plot changes in temperature at different altitudes from a NASA space flight.

1 2 3 4 5

Learning Experiences in the Rigor/Relevance Framework

Science	Elementary Examples

Quadrant C Assimilation

6
- Write and illustrate biographies of inventors.
- Make diagrams of animal life cycles.
- Classify a group of similar objects to create a dichotomous key.

5
- Conduct experiments to show photosynthesis.
- Research an endangered species.
- Make observations of similarities and differences of fish heads and predict food sources.

4
- Research characteristics and habits of insects.
- Write a story describing the movement of water through municipal water systems.

3

Quadrant D Adaptation

- Design a candy dispenser that works without gravity.
- Invent a musical instrument.
- Design a zoo.
- Study bread chemistry, purpose of ingredients, and how changes affect final product.
- Set up experiments to test life length of batteries.
- Research and write a field guide for identifying local trees.
- Build a simple robotic device with string, tape, and rubber bands.

Quadrant A Acquisition

- Memorize names of planets in solar system.

2
- Demonstrate phases of the moon.
- Participate in simple hands-on activities that demonstrate Bernoulli's principle of air pressure and air flight.
- Match pictures of insects with their names.

1
- Illustrate parts of a cell.
- Make a model of the layers of Earth's atmosphere.
- Make daily observations of the life cycle of an animal in the classroom.
- Create a mural showing various kinds of creatures that live in the ocean.

Quadrant B Application

- Develop a food list for a space trip.
- Create a class book about the animal and plant life in local rivers.
- Take photographs of insects to describe characteristics and behaviors.
- Study examples of paper airplanes and then create one.
- Keep a field journal about the insects that live near your school.
- Develop an acid test and sample rainwater for acidity.
- Create electrical circuits of various materials and determine properties of conductivity and insulation.
- Analyze characteristics of different soil types.

1 2 3 4 5

Learning Experiences in the Rigor/Relevance Framework

Science	Middle Level Examples

Quadrant C Assimilation

6
- Design a science project to illustrate a science concept (e.g., photosynthesis).
- Analyze similarities and differences of spiders and insects.

5
- Research and sequence ages of plant and animal species.
- Discuss the impact of fat and cholesterol in nutrition and health.
- Research and produce news program on earthquakes.

4
- Research and give presentations on astronomy topics.
- Identify chemicals dissolved in an unknown solution.

3

Quadrant D Adaptation

- Measure light pollution in the community.
- Collect data and make recommendations to address a community environmental problem.
- Design an air pollution control device.
- Design a device to transport human organs.
- Develop a concept for a new product and research the process for patenting the design.
- Collaborate with other students in collecting data on acid rain pH levels in area lakes.
- Design a model bridge to carry a specific load.
- Research communication innovations and predict innovations in the next 20 years.

Quadrant A Acquisition

2
- Measure the effect of temperature and concentration on the rate of a reaction, such as Alka-Seltzer in water.
- Observe wave properties of light, especially the phenomenon of interference, using soap bubbles.
- Construct models of molecules using toothpicks, marshmallows, and gumdrops.

1
- Examine biological rhythms by recording changes in body temperature.
- Use different colors of clay/dough to demonstrate tectonic plates.
- Catalog human physical traits to determine inherited genetic traits.
- Illustrate proportion of world's freshwater, ice caps, and saltwater using an aquarium.

Quadrant B Application

- Analyze heat produced from different fuel sources.
- Build a simple electrical circuit to illustrate digital principle of computers.
- Explore the stopping characteristics of a toy car, altering one variable at a time.
- Investigate the importance of interdependency and diversity in a rain forest ecosystem.
- Collect data on dissolved oxygen, hardness, alkalinity, and temperature in a stream.
- Complete an energy audit of heat loss in a home.
- Conduct experiments to measure calories in foods.

1 2 3 4 5

Learning Experiences in the Rigor/Relevance Framework

Science	High School Examples

Quadrant C Assimilation

6
- Solve a hypothetical science-related problem, such as helping dinosaurs to survive.
- Design experiments and collect evidence to describe the movement of light.

5
- Design a WebQuest on an aspect of chemistry.
- Design observations to demonstrate basic laws of physics.
- Calculate potential and kinetic energy in the movement of a roller coaster.

4
- Create a digital electronic counter.
- Write test questions to illustrate understanding of empirical gas laws.
- Research the discovery of a chemical element.

3

Quadrant D Adaptation

- Explore designs of car safety restraints using eggs in model cars.
- Design and construct a robot.
- Conduct debate on genetically modified food (GMF).
- Solve an organic chemistry case study problem in petroleum distillation.
- Select a method to build a tunnel under a real city.
- Discuss the social, ethical, and emotional consequences of genetic testing.
- Participate in an online debate on a science issue, such as acid rain or deformed frogs.
- Research and write a newspaper article on a viral disease, examining economic and societal impacts.

Quadrant A Acquisition

- Conduct laboratory experiments to observe chemical reactions.

2
- Apply number and computation skills in science, including scientific notation and significant figures.
- Determine the latitude and longitude of geographic locations.
- Use a mnemonic system for remembering metric conversions.

1
- Demonstrate modulation of sound waves using computer animation.
- Conduct experiments to observe properties of acids and bases.
- Memorize elements in the Periodic Table.
- Make observations about the visual effects of concave and convex lenses.

Quadrant B Application

- Map a community site by collecting data with a GPS device.
- Collect and categorize organisms from a natural stream.
- Apply Laws of Gases to design gas storage containers.
- Make weather forecasts based on data.
- Solve electrical current values using Ohm's law.
- Isolate DNA from unknown plant tissues and compare it to sample DNA.
- Participate in an online collaboration to collect scientific data on a global problem.

1 2 3 4 5

Learning Experiences in the Rigor/Relevance Framework

	Social Studies	Elementary Examples
6	**Quadrant C Assimilation** • Write an essay on some aspect of your family or neighborhood. • Analyze similarities/differences between current and previous practices (e.g., compare school today to the 19th century).	**Quadrant D Adaptation** • Create a class business by designing, producing, marketing, and selling a product, such as cookies. • Explore an online resource on inventions and then design an invention to solve a problem.
5	• Role play a simulation of the American Revolution to seek resolution of grievances. • Study African art and folktales and create art objects and related tales.	• Research a location in the U.S., and explain why it is a good place to live. • Create a school bank simulation to illustrate loans, investments, and interest.
4	• Contrast citizens' roles/responsibilities under different forms of government. • Speculate on and describe how changes in climate and natural resources will influence various regions of the world. • Play a simulation game that illustrates supply and demand.	• Read a story about survival and brainstorm strategies for surviving a disaster (e.g., snowstorm, tornado). • Identify a family buying choice, list benefits and costs, and explain why the decision was made.
3	**Quadrant A Acquisition** • Brainstorm meaning of a term such as *citizenship* and read a related book.	**Quadrant B Application** • Map a school facility.
2	• Create a book illustrating and describing landforms using geographic terms. • Memorize names, locations, and capital cities of U.S. states. • Read a biography of a Native American.	• Describe geographic and climatic characteristics of the local community. • Prepare foods from different countries. • Trace family histories of the class and map immigration movements and timelines.
1	• Research and celebrate a holiday from another country. • Read historical novels about the contributions of American women. • Develop a timeline of U.S. history events. • Visit a historical museum.	• Interview people who have lived elsewhere and develop a list of different community characteristics. • Observe a local farming enterprise and discuss career and business opportunities. • Explore buying options and comparison shop for a product. • Use different map scales (linear, fractional, and word) to measure the distance between two places.
	1 2 3 4 5	

Learning Experiences in the Rigor/Relevance Framework

Social Studies	Middle Level Examples

Quadrant C Assimilation

6
- Complete an interdisciplinary research project for a significant historical event.
- Use physical, topographical, political, and economic maps to compare and contrast early American civilizations.

5
- Research and role play the first U.S. Constitutional Convention.
- View a historical video and critically evaluate perspective and point of view.
- Play a budget simulation game to analyze results of economic decisions.

4
- Identify and analyze primary and secondary source documents to understand the usefulness of each.
- Research how economic decisions are made in other countries as compared to the U.S.

3

Quadrant D Adaptation

- Participate in an online discovery adventure exploring historical ruins.
- Analyze and debate the role of advertising in school.
- Solve problems by evaluating, taking, and defending a position on an issue, such as immigration or public transportation policy.
- Create a WebQuest to illustrate the "American Dream."
- Create a website for the local community.
- Research and present opinions of candidates running for office.
- Find examples of stereotyping in historic and current events.
- Compare the shaping of public opinion in colonial times to modern times.

Quadrant A Acquisition

- Discover characteristics of society in an earlier decade by reading historical documents, such as wills and letters.

2
- Read about and discuss personal credit options.
- Research inventions of ancient civilizations.
- Define common terms used in various forms of government.

1
- View a historical video and answer factual questions.
- Construct a replica of a Native American village.
- Study colonial life through historical fiction.
- Make a map showing the growth of the United States from 1783 to 1914.

Quadrant B Application

- Develop a personal financial plan.
- Compete in a stock market investment simulation or game.
- Locate and catalog community service organizations.
- Research the status of specific legislation using a Congressional Internet site.
- Research what items cost in other countries and use exchange rates to relate to U.S. prices.
- Explore buying options and comparison shop for products.
- Plan and participate in a community service activity.
- Hold an international festival.

1 2 3 4 5

Learning Experiences in the Rigor/Relevance Framework

Social Studies	High School Examples

Quadrant C Assimilation

6
- Compare/contrast how ancient civilizations valued women, social responsibility, and equality.
- Research and give a presentation on an historical example of nationalism.

5
- Answer data-based questions using copies of original historical documents.
- Participate in a Socratic seminar on a policy issue, such as privacy.
- Use case studies to investigate how economic systems affect people's incentive for economic gain.

4
- Analyze decisions leading to major turning points in U.S. history and hypothesize about what might have happened if decisions had been different.

3

Quadrant D Adaptation

- Conduct a survey and analyze results on First Amendment issues related to Internet use.
- Analyze a local, state, or national issue and prescribe a response that promotes the public interest or general welfare (e.g., a voter registration campaign).
- Research and debate economic issues and public policy related to the Internet, such as sharing of online music.
- Evaluate a common practice or proposed legislation for consistency with the Constitution/Bill of Rights, and write your opinion in a letter to an elected official.
- Analyze a school/community problem, suggest a solution, and prepare a plan to solve it.

Quadrant A Acquisition

- Observe local government proceedings.
- Complete interactive mapping activities on European geography.

2
- Report on a complex historical event.
- Complete an in-depth geographic study of a world region by analyzing demographic data.

1
- Recognize why international trade takes place and the role of exchange rates in fostering or inhibiting trade.
- Trace the evolution of American values, beliefs, and institutions through a study of their constitutional and institutional development.
- Research key aspects of the state constitution.

Quadrant B Application

- Be a juror on a local youth court.
- Conduct a school/community survey on a social issue and analyze results.
- Write a letter of support for a proposed local or state policy.
- Complete an income tax form.
- Draw from memory a map of the world indicating the relative location of continents, oceans, major river systems, nations in the news, and important cities.
- Locate and interpret current and historical economic data (e.g., GDP, CPI, employment).
- Analyze credit options, calculate purchase costs, and complete a credit application.

1 2 3 4 5

Learning Experiences in the Rigor/Relevance Framework

Visual & Performing Arts

Elementary and Secondary Examples

Quadrant C Assimilation

- Compare characteristics of various visual art mediums appropriate for the artist's purpose and intent.
- Critique musical performance.
- Research and compare different forms of dance.
- Point out similarities and differences in two musical compositions on the same theme.
- Diagram the differences between tragedy and melodrama; comedy and farce.
- Compare artistic styles of different cultures.
- Develop a timeline of a style of painting and significant artists.

Quadrant D Adaptation

- Write and perform an original musical piece.
- Adapt a musical piece written for one instrument to another instrument.
- Create an original three-dimensional work of art.
- Design and create animation in a computer environment.
- Write a short review of a high school dance performance.
- Design a set, develop costumes, or write a song for a scene of a play.
- Select a performance of musical pieces appropriate for a specific culture or period in history.

Quadrant A Acquisition

- Explain the color wheel.
- Memorize musical notes.
- Conduct a virtual museum field trip.
- Observe a theatrical production and reflect on themes.
- Identify the medium and materials for two-dimensional works of art.
- Describe basic elements of music such as melody, rhythm, and harmony.
- Explain how sound is produced on a traditional or electronic instrument.

Quadrant B Application

- Perform a musical piece from memory.
- Create a collage using cut black and white paper that utilizes positive and negative space.
- Use current technology to create, produce, and record/playback music.
- Interview professional artists to learn about their preparation pathway to a career.
- Sing a choral performance following direction.
- Identify orally the meter of a song sung by classmates.
- Sing folk music common to a period of history in the United States.

6 5 4 3 2 1

1 2 3 4 5

Learning Experiences in the Rigor/Relevance Framework

Health and Physical Education

Secondary Examples

Quadrant C Assimilation

6
- Analyze advertisements that target youth.
- Compare the benefits of different forms of cardiovascular exercise.

5
- Analyze a case study to determine strategies for enhanced health and risk reduction.
- Analyze the possible causes of conflict among youth in schools and communities.

4
- Analyze how health laws, policies, and regulations protect personal and environmental safety.
- Analyze media ads and marketing practices for fitness and sports equipment.

3

Quadrant D Adaptation

- Create an advertisement to combat unhealthy youth advertising.
- Design an exercise program for senior citizens.
- Coach a younger sports team.
- Set a personal physical activity goal and track progress toward its achievement.
- Modify a fitness plan to accommodate space limitations, environmental conditions, and/or time constraints.
- Create a dance with a partner that combines movement to music from a specific culture.
- Propose a solution to address typical family and community health issues.

Quadrant A Acquisition

- Describe the effects of drugs on the human body.

2
- Describe personal safety rules to avoid such things as abuse, abduction, poisoning, and accidents.
- Acquire the fundamentals of basketball.

1
- Watch a video on poor nutritional habits.
- Identify the components of personal wellness, such as nutrition and weight control, disease prevention, stress management, safety, and physical fitness.
- Identify community agencies in sports, recreation, and health.

Quadrant B Application

- Demonstrate strategies to reduce the spread of germs.
- Handle sports equipment safely.
- Play a baseball game.
- Calculate target heart rates and maintain a record of activities in a fitness log.
- Perform cardio-respiratory activities at an intensity level within the target heart range.
- Plan a nourishing meal and submit a written daily menu plan.
- Wash hands before and after handling food.
- Develop physical fitness skills through regular practice, effort, and perseverance.

1 2 3 4 5

Learning Experiences in the Rigor/Relevance Framework

Second Language	Secondary Examples

Quadrant C Assimilation

6
- Read and analyze a literary work in a second language.
- Compare and contrast English and Latin grammar.

5
- Interpret full-length original versions of poetry.
- Analyze cultural similarities between the home country and a country in which the target language is spoken.

4
- Discuss songs, stories, and selected excerpts from the literature of the target language.
- Use context clues and accumulated experience to understand unfamiliar vocabulary.

3

Quadrant D Adaptation

- Teach language skills to younger students.
- Report orally on a radio news broadcast that covers contemporary themes and issues.
- Express complex ideas using simpler forms of language.
- Engage in a problem-based activity collaborating with students in a foreign country.
- Prepare a video to teach verb conjugation to others.
- Create a social event reflecting the culture and language of another country.

Quadrant A Acquisition

- Translate common vocabulary.

2
- Speak error free in brief exchanges with classmates and teacher.
- Transcribe material read aloud by the teacher.
- Demonstrate an awareness of Latin roots in English.

1
- Watch television programs in the target language.
- Recognize cultural patterns and traditions of the target culture in the target language.
- View slides or video depicting diversity within the target culture.

Quadrant B Application

- Role play daily activities such as ordering in a restaurant or shopping, using authentic materials from the target language and culture.
- Write a brief message about an everyday activity.
- Read aloud with correct pronunciation.
- Conduct an interview with a native speaker of the target language.
- Use knowledge of Latin vocabulary to determine the meaning of English derivations.
- Respond appropriately to questions based on oral communication or reading passages.

1 2 3 4 5

Learning Experiences in the Rigor/Relevance Framework

Career and Technical Education	Secondary Examples

Quadrant C Assimilation

6
- Compare features of web development software. (Business)
- Compare heat loss ratings and the cost of building materials. (Construction)

5
- Analyze child safety hazards. (Family/Consumer)
- Compare sanitation for types of germs. (Health Occupations)
- Compare methods of chemical and biological control of weeds. (Agriculture)

4
- Analyze commercials for purpose and impact. (Marketing)
- Design levers and machines to move a specific weight. (Technology)
- Compare the operation and maintenance of types of transmissions. (Automotive)

3

Quadrant D Adaptation

- Create a full website for a local business. (Business)
- Design and construct a storage shed. (Construction)
- Develop a brochure for parents on child safety. (Family/Consumer)
- Design a poster to remind people of techniques to reduce the spread of disease. (Health Occupations)
- Design an experiment to test the effects of herbicides. (Agriculture)
- Create a commercial for a local business. (Marketing)
- Design a robotic arm. (Technology)
- Troubleshoot and correct problems with an automatic transmission. (Automotive)

Quadrant A Acquisition

- Demonstrate web development software functions. (Business)

2
- List safety procedures. (Construction)
- List parent responsibilities. (Family/Consumer)
- Give examples of harmful and helpful bacteria. (Health Occupations)
- Identify species of weeds. (Agriculture)

1
- List components of a typical business plan. (Marketing)
- Demonstrate simple machines. (Technology)
- Describe the function and operation of a transmission. (Automotive)

Quadrant B Application

- Design a web page. (Business)
- Use power tools correctly. (Construction)
- Demonstrate childcare tasks with a simulated infant. (Family/Consumer)
- Demonstrate correct hand washing techniques. (Health Occupations)
- Calculate application rates for herbicides. (Agriculture)
- Give a five-minute demonstration on a new product. (Marketing)
- Use 3-D modeling software to create a design. (Technology)
- Drain and replace fluid in a transmission. (Automotive)

1 2 3 4 5

Implementing the Rigor/Relevance Framework

Communicating with Students About Rigor and Relevance

While students typically understand the Rigor/Relevance Framework, teachers may be reluctant to talk with students about the level of their learning in terms of rigor and relevance. In reality, however, teachers have found that students can be one of the strongest advocates for increasing rigor and relevance. Students are hungry for applications in which they can see the relevance of what they are learning. Students also like to be challenged in meaningful ways.

Share the description of the Rigor/Relevance Framework with students and ask them to reflect on their learning experiences that fit within the various quadrants. Students should regularly be aware of the level of your instruction and recognize that both the strategies you use and the role you play as a teacher change as you move into higher levels of rigor and relevance. Likewise, students' work and responsibilities change at higher levels of rigor and relevance. If students understand the framework and levels of instruction, they are more easily directed to complete the work for high-rigor/high-relevance learning.

The experience of engaging students in the Rigor/Relevance Framework has been very positive in many model schools. You can obtain posters of the framework from the International Center to post in the classroom. In some schools, students lead recognition programs for outstanding high-rigor/high-relevance lessons. Students can be positive advocates for increasing rigor and relevance. Engage them in the conversation.

Communicating with Parents About Rigor and Relevance

The Rigor/Relevance Framework provides a common denominator for educators to think about and discuss the level of instruction. The framework is also an effective tool for communicating with non-educators, especially parents. The framework can help parents become more active partners in their children's education.

As part of parents' night, spend a few minutes explaining the Rigor/Relevance Framework, or better yet, have the principal explain it as a schoolwide initiative.

Suggestions for using the Rigor/Relevance Framework in communicating with parents include the following:

- Select a developmental skill area, such as multiplication, where students might be in Quadrant A at their current level. Give examples of how their skills will be extended during the year into one or more of the other quadrants.
- Instead of listing topics to be covered during the year or showing a content outline, give parents a list of student objectives and student work that has work labeled in a quadrant on the Rigor/Relevance Framework. This will

help parents understand what their children will be doing, which work will be more challenging, and which will require application.

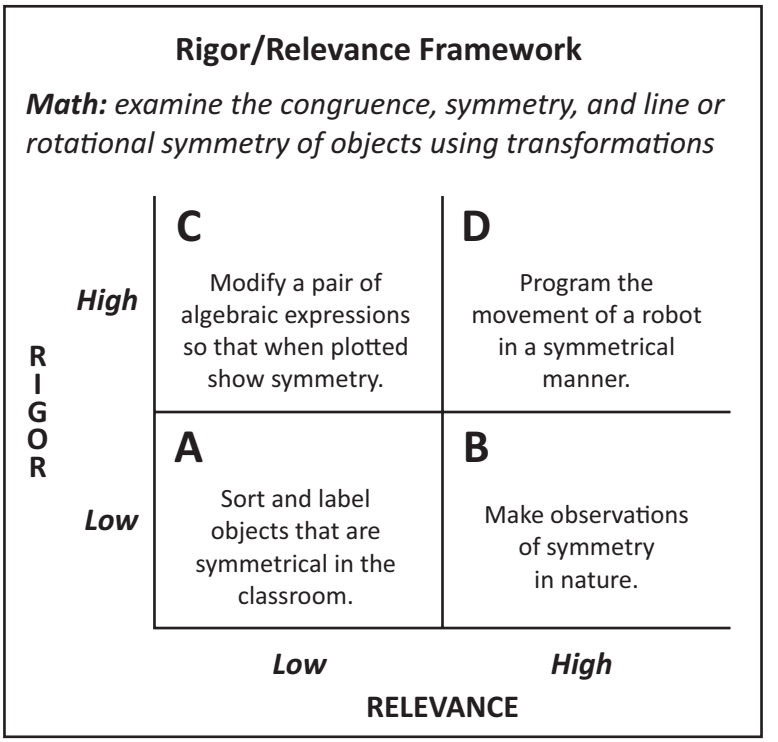
- When planning activities such as field trips and class projects, include the level of activity in the Rigor/Relevance Framework. This will remind parents that all activities have a connection to learning objectives and that special events serve to extend student learning into the application and assimilation quadrants.
- Provide parents with suggested readings and community and online activities that they can do with their children to extend learning into other quadrants. For example, you might suggest ways that parents can review math facts while walking through a store. Explain to parents that they are not teaching math (which they might think is your job) but rather showing their children ways to apply their knowledge.

Standards and the Rigor/Relevance Framework

The standards movement of the past several decades has caused teachers to shift thinking from curriculum consisting of a list of content knowledge to more of a description of knowledge that students must demonstrate. Standards are useful and have created more uniformity in high expectations for students. However, most standards are written very broadly. When test developers write test questions, standards are written in more specific language for students to demonstrate knowledge by selecting a correct answer or writing a short explanation. The nature of large-scale, standards-based assessments drives these questions toward low rigor and low relevance.

When teachers begin to teach to a standard, they may think, "Here is the knowledge, let me demonstrate or explain, then I'll have the student practice it." Students do learn from watching and practicing. However, an instructional routine that always follows this manner becomes dull and boring. Students often see little value in it and therefore put forth little effort. When teachers are given the additional pressure of making sure students answer low-rigor and low-relevant test questions, it only reinforces this routine, direct instruction.

Standards rarely define the level of rigor and relevance. It is up to the teacher to define the appropriate level of rigor and relevance. This objective will be further explained in Chapter 2. Most standards can and should be taught at higher levels of rigor and relevance. When students have the chance to demonstrate learning at higher levels of rigor and relevance, they learn standards more deeply, retain the learning longer, and become more engaged in learning.



Study an example from a common middle-level geometry standard: "Have students examine the congruence, similarity, and line or rotational symmetry of objects using transformations." A teacher who chooses to teach this standard in:

- **Quadrant A** might have students sort and label objects that are symmetrical in the classroom.
- **Quadrant B** might have students make observations of symmetry in nature.
- **Quadrant C** might challenge groups of students to modify a pair of algebraic expressions so that when they are plotted they show symmetry.
- **Quadrant D** might give students a robot and have them program the movement of a robot in a symmetrical manner.

Each of these learning experiences is based on the same standard, but they are very different in terms of learning and engagement. What about the test? If students have learned to apply math concepts deeply in these challenges, answering low-level questions on a test is just one more challenge. Teaching toward high rigor and high relevance is a better way for students to meet standards.

Ways to Increase Rigor and Relevance

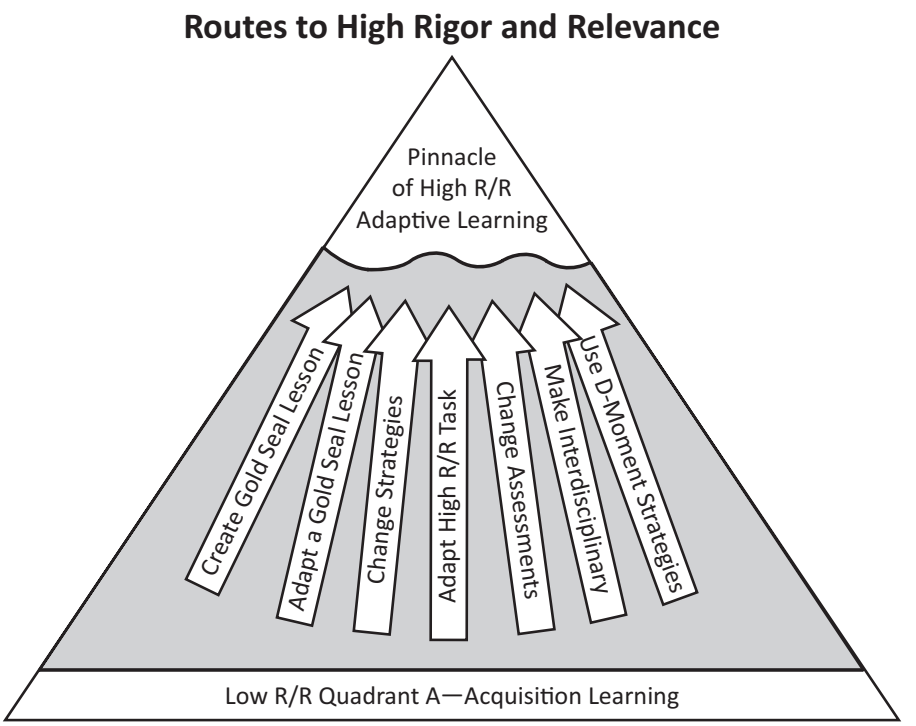
Teachers can use several paths to increase rigor and relevance in their instruction. Teachers may use one or more of these routes depending upon their instructional situation and their level of familiarity with the Rigor/Relevance Framework.

Create a Gold Seal Lesson

A Gold Seal Lesson is a lesson idea format that the International Center uses to share great instructional ideas that reflect high rigor and high relevance. By going through the process of developing a Gold Seal Lesson, teachers not only strengthen their understanding of the characteristics of high-rigor and high-relevance instruction, they also create an idea that can be shared with other teachers. Often schools, districts, or regions work collaboratively to develop Gold Seal Lessons and share these instructional ideas among all teachers. A sample Gold Seal Lesson is in Chapter 3.

Adapt a Gold Seal Lesson

Once teachers become familiar with the Rigor/Relevance Framework and the resource of Gold Seal Lessons, the most common way teachers can increase rigor and relevance is to adapt a Gold Seal Lesson to their particular instructional setting. Teachers can browse a grade level, subject, or set of standards to find a lesson idea from another teacher that will fit their instructional situation. Each Gold Seal Lesson provides a clear performance task and assessment that can be used to develop the unit of instruction.



Add a High-Rigor and High-Relevance Performance Task

Most teachers modify existing lessons to increase the level of rigor and relevance. Begin to raise rigor and relevance by considering the instructional outcomes or standards for a particular unit of instruction; then design a high-rigor and high-relevance performance task as the culminating activity for students to demonstrate their learning. This begins the backward design approach in which teachers clearly focus on the high-rigor and high-relevance conclusion of the lesson. A carefully constructed performance task naturally leads teachers to raise the rigor and relevance of instruction, thus increasing student achievement.

Change Instructional Strategies

Teachers have many choices among the instructional strategies they use in a particular lesson. Some strategies, such as lecture and worksheets, are highly correlated with low rigor and low relevance while other strategies, such as project design, problem-based learning, and student presentation, are highly correlated with high rigor and high relevance. As you select strategies, increase the level of rigor and relevance by using strategies that are more correlated with high rigor and high relevance. Correlation of instructional strategies with rigor and relevance are in Chapter 5.

Change Assessments

The type of assessment a teacher chooses to use determines student achievement and influences the level of rigor and relevance. Often a simple way to begin to raise the level of rigor and relevance is to use a more complex form of assessment that does more than simply ask students to recall answers. The assessment should challenge students to think as well as more fully explain and demonstrate their knowledge.

Make Instruction Interdisciplinary

A natural step toward high rigor and high relevance is to move beyond the boundaries of one instructional area. Typically, secondary instruction is very focused on one instructional area; even elementary-level teachers tend to focus on one instructional strand. As teachers work to increase the relevance of instruction, the boundaries between disciplines typically disappear. Another approach to increasing rigor and relevance is to combine learning standards from several different disciplines into a single learning experience. An excellent strategy for making instruction more interdisciplinary is for teachers in the arts and career and technical education to integrate a number of academic areas within their instruction. This practice often increases the level of rigor and relevance.

Use D-Moment Strategies

Some teachers have the misconception that rigor and relevance require long, extended projects that consume considerable instructional time. Once teachers understand the Rigor/Relevance Framework, they can begin to identify short (often with a single period) instructional strategies that increase student thinking (rigor) and real-world application (relevance). Teachers can apply many of these generic D-moment strategies (from Quadrant D) within their instruction to increase rigor and relevance. (D-Moments are further explained in Chapter 5.)

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Chapter 2

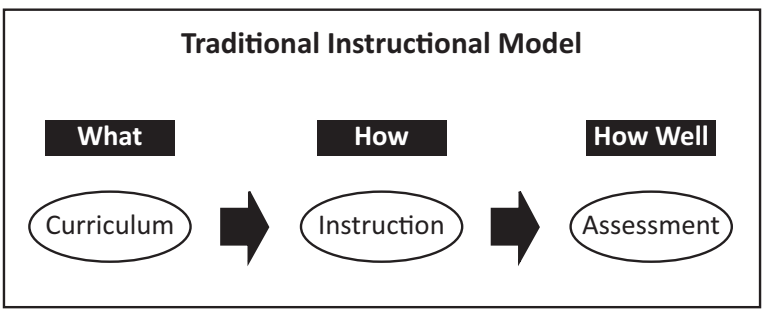
Planning Instruction

Backwards Design Approach

Elements of Good Planning

Instructional planning is often divided into three components: curriculum, instruction, and assessment. Curriculum is what students learn, instruction is how students learn, and assessment is in what *way* and *how well* students are expected to demonstrate what they have learned as a result of the instruction.

Traditionally, these three elements have been approached as three separate steps, one following the other, as shown in the following figure. Many teachers learned to plan their lessons using this linear model: decide what to teach, design how to teach it, and then determine how to measure student achievement.



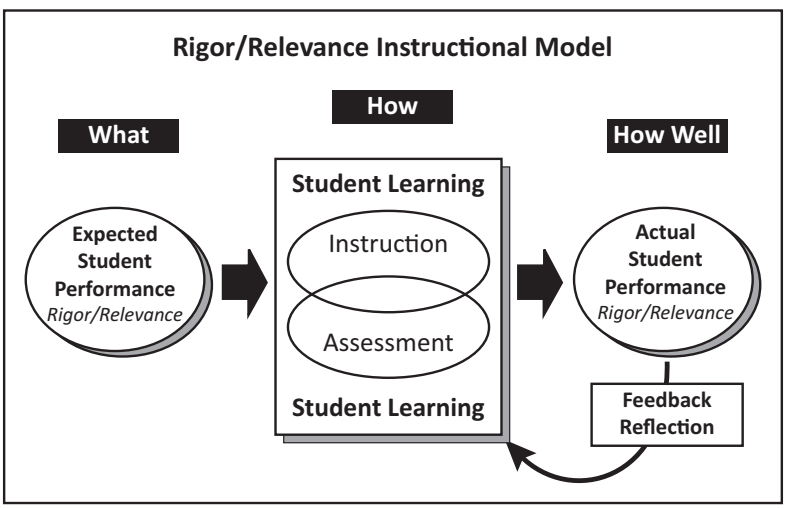
When following a traditional model, teaching often proceeds in such a linear manner. Teachers introduce topics one after the other, pausing only long enough for a chapter or unit test. Particularly at the secondary level, instructional planning focuses on covering the topics at a uniform rate of speed.

Recent research and innovations in teaching and learning clarify that curriculum, instruction, and assessment are not separate and linear but interrelated. When instruction clings to a linear traditional model, teaching becomes "coverage" and can be described as a "teach it, test it, lose it" mentality. A model such as this fails to emphasize student learning and lacks characteristics that lead to retention of learning and student engagement.

Improving student learning requires deliberate interventions by teachers and other staff. The Rigor/Relevance Framework helps teachers facilitate high levels of student learning in this new instructional design. Student learning is the result of a combination of facilitated instructional experiences and assessments. (See the Rigor/Relevance Instruction Model.) Rigorous and relevant learning starts with an expected student performance using the Rigor/Relevance Framework. After completing a unit, the teacher reflects on the actual level of student performance and decides whether to modify and attempt to improve the instruction and assessment to attain higher levels of performance.

Planning Rigorous and Relevant Instruction

When higher levels of rigor and relevance are expected of students, a linear model is not effective. To attain higher levels of rigor and relevance, instruction and assessment must not be separate and linear but interrelated. Learning takes place when all components are dynamically linked. In rigorous and relevant learning, instruction and assessment should have significant overlap. Authentic assessment should occur more naturally as part of the instructional process. The current assessment reform movement seeks to place greater emphasis on student performance rather than on recall of facts. Teachers are better able to plan quality instruction and assessment if they abandon the image of linear steps with assessment following instruction.



Curriculum planning occurs prior to instruction and assessment. Without effective planning, there is little likelihood that students will achieve the expected rigor and relevance. Curriculum planning is a complex process. It is much more than simply picking out a work of literature or a textbook chapter and deciding that it would make a good instructional topic. Teacher experience and data should be considered in order to make thoughtful decisions about instruction and assessment.

When teachers hear the word "curriculum," they generally think of unit or lesson plans that describe teacher procedures and/or student activities that take place in a classroom. It is natural for teachers to think about these plans and immediately jump to imagine what they will look like in their classrooms. With teachers under constant pressure to present activities that engage students, there is precious little time to do much planning — such is the structure of the U.S. education system.

While curriculum must lead to unit plans and lessons plans, curriculum planning does not begin with them. Teachers who begin and end their curriculum planning by writing a lesson plan miss important curriculum decisions.

The curriculum is a means to an end: a performance by the student. Teachers typically focus on a particular topic (e.g., volume of three-dimensional figures), use a particular resource (e.g., Periodic Table of Elements), and choose specific instructional methods (e.g., problem-based learning) to build learning that meets a given standard. However, each of these decisions is actually a step in a learning process that should end in a performance by the student. Student activity without an end performance in mind is often busy work. Instruction, no matter how engaging or intellectual, is only beneficial if it ends with students demonstrating their knowledge and performing skills from the learning experience. A performance approach to curriculum planning should begin with the specific student performance.

Wiggins and McTighe in *Understanding by Design* refer to a curriculum process that begins with the end in mind as "backwards design." (Wiggins, Grant and McTighe, Jay. *Understanding by Design.*) It may seem backward to many teachers who move "forward" with textbooks, favored lessons, and time-honored activities rather than deriving those tools from targeted goals or standards. The Understanding by Design model is one of a number of excellent approaches to designing curriculum with the clear goal of student learning as the first step. Regardless of the model selected, teachers should start with the end — the desired results (goals or standards) — and then derive the curriculum from the evidence of learning (performances) called for by the standard and from the teaching needed to equip students to perform.

Backward design may be thought of as purposeful task analysis: given a task to be accomplished, how do we get there? What kinds of lessons and practices are needed to master key performances? This approach to curriculum design is a logical systems approach, but it runs contrary to conventional habits, whereby teachers think in terms of a series of activities or how best to cover a topic.

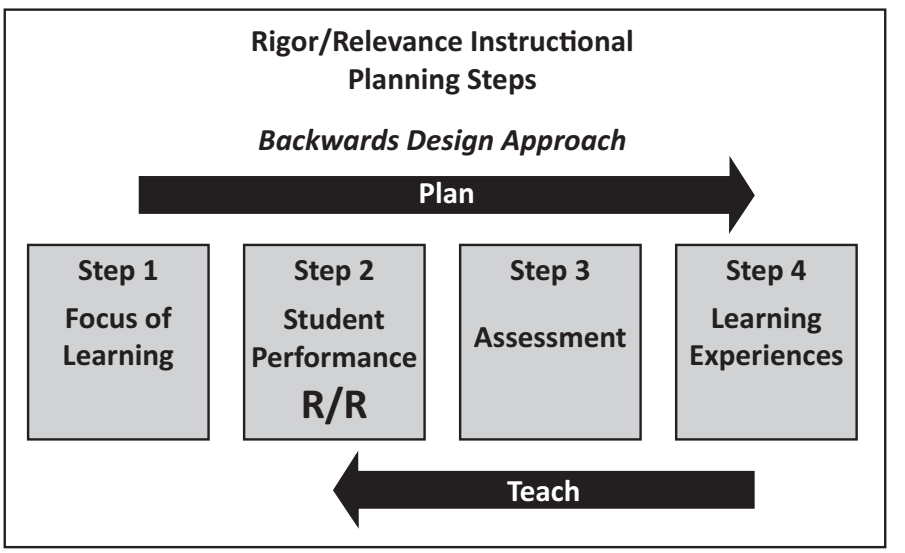
This backward approach to curricular design also departs from another common practice: thinking about assessment as something to plan after teaching is completed. Rather than creating assessments near the conclusion of a unit of study (or relying on the tests provided by textbook publishers, which may not assess state standards completely or appropriately), backward design calls for teachers to think about the work students will produce and how it might be assessed as they begin to plan a unit or course.

Instructional Planning Steps

There are four major steps in planning rigorous and relevant instruction:

1. Define the focus of learning.
2. Create the student performance.
3. Design the assessment.
4. Develop the learning experiences.

The four steps are presented in the order in which ideal planning should occur.



The tools that accompany the various steps are detailed in the discussion below and appear at the end of this chapter.

Step 1: Define the Focus of Learning

Instruction in school is not unlimited to any topic or timeframe. Limits define what to teach, how much time to allow, and how to connect one instructional unit to other units to form a course or grade level. Defining focus simply is thinking through how this unit fits into the overall school program. (Planning Tool: Focus of Learning Worksheet)

1.1: Define the Focus of the Unit

This planning step ensures that the design of student work, content, and instructional activities is not random but rather well defined by the limits of time, students served, and relationship to other units or courses. Begin by defining the audience and the context.

- For what group of students is this unit (grade level, previous experience)?
- Is there a unifying theme, problem, or project?
- What subject or subjects are included?
- Is there a specific standard on which the unit will focus?
- Is there a specific project students will complete or a problem to be solved?

Every curriculum planning effort requires a focus or two. This focus can be chosen from among many different things. It drives the decisions around curriculum planning and helps to define what is an appropriate performance and what is included in the curriculum. The following list shows examples of focus areas:

- a state standard that should be addressed, such as "acquiring information from electronic sources"
- a project to design, such as a robot or a mechanical device
- a problem to resolve, such as a community issue or political question
- a course description, such as introductory biology or calculus
- an interdisciplinary theme, such as oceans, dinosaurs, or transportation
- an interdisciplinary connection, such as wave theory and communication devices (physics and technology)
- a period in history, such as the Renaissance or the Industrial Revolution
- a group of students, such as high school juniors applying to college or students at risk of dropping out
- a work of literature, such as a biography or novel
- an inquiry into an intriguing event or observation, such as bird migration or solar eclipse

1.2: Cross-Reference to Standards

Even if a standard is not the organizing focus for the lesson, the lesson should be cross-referenced to standards. When completing focus, identify standards of learning that are developed through this lesson. Keep your thinking open to standards from multiple subject areas.

In addition to state standards, the International Center has developed a list of Essential Skills based on the National Essential Skills Study (NESS). The results of this study indicate what educators, business and industry, and the general public think are the most essential skills and may be a useful component of cross-referencing to standards.

Step 2: Create the Student Performance

Defining the student performance is divided into three phases; the answer to each question builds one part of the performance. (Planning Tool: Student Learning Worksheet)

- First, what are students expected to learn including knowledge, skills, behaviors, and concepts?
- Second, what is the expected student work and its level of rigor and relevance?
- Third, what is the performance task that describes how students will demonstrate student learning?

2.1 Student Learning

This step has an important purpose — to place emphasis on student learning. Thinking about what students need to know and be able to do shifts the focus of the curriculum planning process from the teacher to the student.

- Make statements used to identify the skills and knowledge as specific as possible. Do not simply repeat the standards. Describe in simple terms what students are expected to learn.
- Use verbs that indicate some action to be taken rather than the passive accumulation of knowledge.
- Think about student learning in four categories to include all of the important aspects students can learn: concepts (big ideas), declarative knowledge, skills (performing and thinking) and behaviors (work habits).

2.2 Student Work

Student work is at the heart of learning. Focusing on student work is also an excellent means of measuring the quality of instruction. Teachers can improve learning in their classrooms by concentrating on student work as part of curriculum planning. Student work is defined as the observable effort or tangible products produced by a student. Examples of observable efforts are group discussion, research, reading, troubleshooting a process, and brainstorming. Tangible products might include pieces of writing, science experiments, solutions to problems, test questions, and project designs.

Student work provides the most tangible evidence of the learning process. The best way to judge the quality of teaching and learning is by looking at the work that students are producing in the classroom.

- Is the work meaningful and challenging?
- Are all students actively engaged?
- Do students have a clear understanding of what constitutes outstanding work?
- Do students show commitment to and enthusiasm for their work?

The answers to these questions provide rich evidence of the quantity and quality of learning taking place.

Teachers should spend time thinking about what significant pieces of work students will produce and not limit themselves by simply defining the content and objectives for what students will learn. By defining student work early in the planning process, teachers have an indication of what is appropriate to assess. In most cases, the work should be used to evaluate the students. If this work is some type of presentation, teachers should develop objective criteria to judge the quality. If the work involves gathering knowledge or memorizing facts, a multiple-choice or constructed-response test is appropriate. Using student work as the basis for assessment helps to identify clearly for students what they are expected to learn.

The information sheet Examples of Student Work for Real-World Instruction is a good reference for defining student work as a part of lesson planning. After identifying the skills and knowledge that students will acquire in the unit of instruction, select types of student work and expand them into a definition of specific work students might produce as a part of the unit. Again, reflect on the levels of rigor and relevance to make sure the student work is consistent with the levels designated in the setting of student competencies. Taking the time to reflect on student work will lead to greater application in instruction and assessment.

Examples of Student Work for Real-World Instruction

- Advertisement
- Audiotape
- Autobiography
- Banner
- Biography
- Brochure
- Business
- Cartoon
- Chart
- Children's book
- Coat of arms
- Collection
- Community service
- Composition
- Constitution
- Construction
- Contract
- Correspondence
- Crossword puzzle
- Debate
- Defense
- Demonstration
- Design
- Diagram
- Diorama
- Discussion
- Display
- Dramatization
- Drawing
- Editorial
- Essay
- Eulogy
- Evaluation
- Exhibit
- Experiment
- Fable
- Family tree
- Field guide
- Flag
- Game
- Graph
- Icon
- Interview
- Invention
- Joke
- Journal
- Letter
- Log
- Machine
- Magazine
- Manufacturing process
- Map
- Memo
- Memoir
- Mnemonic
- Model
- Mosaic
- Mural
- News report
- Newspaper
- Oral history
- Oral report
- Painting
- Petition
- Photo album
- Play
- Poem
- Poster
- Production process
- Proposal
- Puppets
- Questionnaire
- Questions
- Rap
- Relief map
- Research report
- Resume
- Rules
- Scale model
- Scrapbook
- Script
- Sculpture
- Shadow box
- Sketch
- Skit
- Slide show
- Software application
- Solution
- Song
- Speech
- Story
- Survey
- Taxonomy
- Teach a lesson
- Test
- Theory
- Time capsule
- Totem pole
- Videotape
- Website

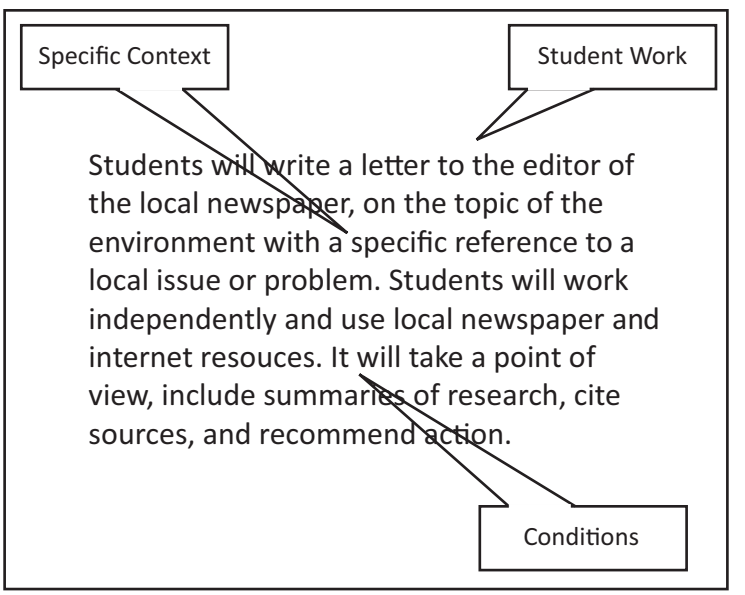
2.3 Performance Task

The performance task is a description of how a student is expected to demonstrate learning (understanding, knowledge, and skills). The task may be a product, performance, or extended writing that requires rigorous thinking and relevant application. It is usually written in the third person describing the learning to other educators. (Planning Tool: Performance Task Worksheet)

Performance tasks can be positioned at several levels of rigor or relevance. By using the Rigor/Relevance Framework in this planning step, a teacher can develop appropriate levels of instruction more accurately. For example, when an expectation is set of real-world application by designating Quadrants B or D on the framework, a conscious commitment is made to work toward real-world application. Likewise, designating high rigor in Quadrants C or D requires instruction that supports high-level thinking skills. Examples of both elementary and secondary high-rigor and high-relevance performance tasks follow.

Performance tasks include the following:

- Student work that will be produced or performed
- Specific learning context
- Conditions (often real world) under which the work will be done:
  - Group or individual work
  - Resources needed
  - Setting where students will complete the work



Examples of High Rigor/High Relevance Performance Tasks (Elementary)

Pre-K

Students will create a tree map for various weather conditions and seasons indicating the appropriate clothing for changes in the weather and seasons of the year. Students will perform dramatizations on selecting the proper clothing.

1st Grade Science

Students will construct an exhibit on the topic of the five basic needs of living organisms. Students must include data they researched and give a verbal explanation of their findings.

3rd Grade Mathematics

Students will design a board game on the topic of multiplication based on a survey of all 3rd grade students regarding which math facts are the most difficult to remember. Students will demonstrate games in small groups and graph results of improvement of math skills from the game.

4th Grade Social Studies

Students will design a brochure highlighting special features of their state. Students will work in groups and use multiple sources. Students will give an oral presentation to describe their product.

Students will compare and contrast early American lifestyle with today's urban American lifestyle. Students will work in groups of two or three and use books, newspapers, historical documents, and Internet sources. Students will work in class and in the library. Students will take a point of view on the lifestyle they prefer and summarize their findings.

5th Grade

Students will create a children's book explaining bullying. Students must list characteristics of a bully, identify what a bully victim can do to avoid a bully, and describe four ways someone can be bullied. Students must draw what a bully-free school looks like.

5th Grade Mathematics

Students will plan a schoolwide picnic based on the number of students in the school. They will calculate and plan space and seating needs; food required; the number of paper plates, cups, and napkins needed; and serving time. Students will conduct a survey on the types of preferred food and chart the results.

Examples of High Rigor/High Relevance Performance Tasks (Secondary)

Middle Level Health

Students will create an advertisement that shows the healthiest fast food choices based on nutrition research that is graphed and detailed on "combo" meals in four popular fast food restaurants.

9th Grade English

Students have been asked to serve on a superintendent's committee on school issues. The mother of one of the students on the committee wants a book removed from the school library because of material she finds offensive. The student committee member, who is a friend of this student's mother, will research censorship and write a letter to the superintendent urging him or her to take specific action. The reasons and research to support the position will be included.

9th Grade Mathematics

Students will design a poster of a circle graph on the topic of "Healthy Snacks in Snack Machines" that is based on a survey of at least 100 students regarding which snacks they prefer. Students will use data and graphs to make recommendations to the principal about which snacks should be put into school machines.

10th Grade Biology

Students will create a field guide to identify tree species on the school campus in appreciation of Arbor Day. The field guide will include photographs/detailed drawings and accurate taxonomy information on natural environments and information on diseases that negatively impact trees.

10th Grade World History

Students will create a children's book explaining the scientific revolution. Students must identify major historical figures and scientific concepts. Students will provide illustrations and cite sources and research.

Pre-calculus

Students will present to the class predictions and solutions on a local, state, or national issue that involves exponential decay or growth. The students must research the issue, collect data, and create a model to represent this change.

Interdisciplinary

After reading *State of Fear* by Michael Crichton, students will participate in a debate concerning the validity or non-validity of global warming. The research presented in the book as well as research opposing that point of view will be used in formulating a debate. The debate should follow the standard format for a formal debate.

Performance tasks usually do NOT include:

- Assessment (Performance-based implies but does not specify how the performance will be assessed)
- Specific direction to the student
- Specific equipment list
- Homework or reading assignments

Step 3: Design the Assessment

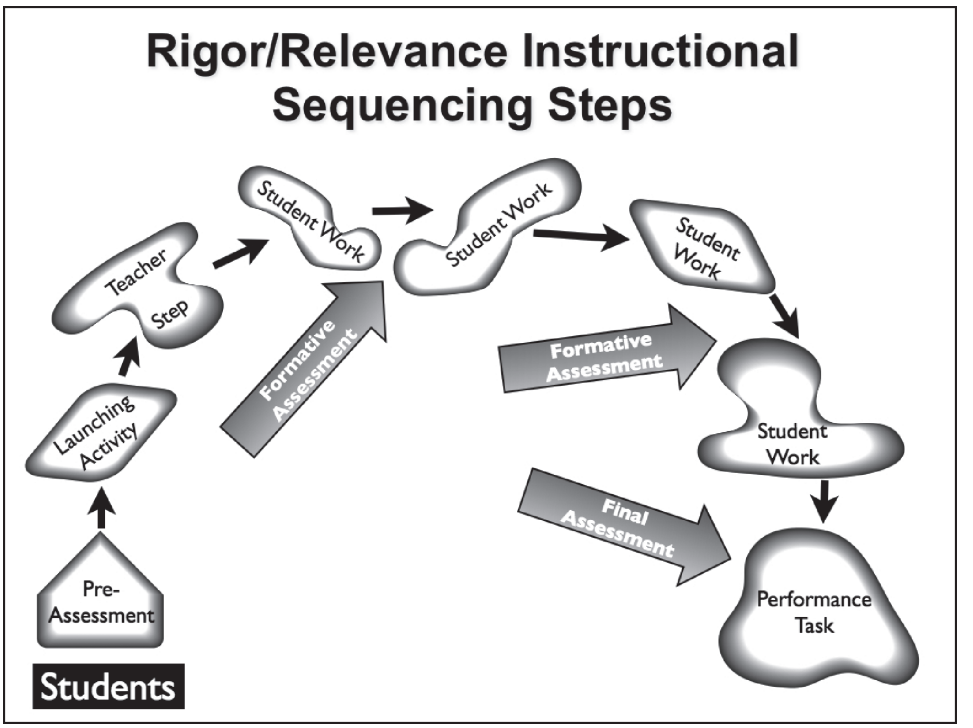
In the Rigor/Relevance Instructional Model, instruction and assessment often occur together; however, consider assessment before planning instruction. There are many types of assessment, and no type is better than another. The point is to choose an assessment type that matches the student work. If the work involves learning a body of knowledge, a multiple-choice or short-answer test may be fine. If the work is a project or performance, a scoring guide/rubric is more appropriate. (Planning Tool: Assessment Worksheet)

To ensure uniform criteria and understanding of what constitutes quality performance on assessments, common rubrics should be used across the curriculum in the various disciplines. Staff should have common standards or benchmarks, provide clear expectations to students, and ensure that members have a uniform understanding of the various degrees, or levels, of meeting benchmarks. With common rubrics, the performance that constitutes a 1, 2, 3, or 4 rating is similar regardless of the course of study the student is pursuing or who the teacher is. Common rubrics are particularly important within the same discipline. For example, science teachers should have the same standards of performance on all lab work.

Using the same rubric for writing, presentations, homework, and other common areas across disciplines reinforces the core academics and ensures a quality performance that all students, staff, and parents understand. In some states, the education department provides rubrics for selected academic areas. This is often the case with writing. Where a state rubric exists, it is best to use it across the curriculum so that the standard of performance expected on state assessments is understood and consistent with acceptable performance throughout the school year.

Step 4: Develop the Learning Experiences—Lesson Sequence

Before describing elements of learning experiences in a unit lesson plan, sequence the lesson. This is the application of the "begin with the end in mind" philosophy. Often it is helpful to sketch this out in a graphical form similar to the following figure. Start with placing the end goal of the performance task at the right. Next, place the starting point at the left side of the diagram. This starting point is where you consider what your students know and their interests. The actual steps between the starting point of students and the performance task will vary depending on the lesson. (Planning Tool: Lesson Sequence Worksheet)



Near the starting point, you might have a pre-assessment or launching activity to generate interest. If you are unsure of the level of students' prior knowledge or you suspect wide variation in that knowledge, you might give a formal pre-assessment to determine the level of knowledge. By using a formal pre-assessment, you can avoid greatly overestimating or underestimating students' ability to progress to the performance task.

When developing your diagram for your lesson, label each step with a specific description of what the activity will be for that lesson. Next, place steps in the lesson that will be separate teacher and/or student work to move toward the final performance tasks. The other information to place on the diagram is formative assessment points. These are teacher-generated tests for you to ensure that students are competent to move to the next step. Using a diagram such as this to sequence the lesson helps you think through the elements to help students achieve the desired performance task.

The next two steps provide additional description about what students will learn.

4.1: Big Ideas

Teachers and students should never get so lost in the details of a lesson that they lose sight of the most important ideas to learn. State those big ideas up front to remind you and your students what is important to learn. Posing an initial question is an excellent way to introduce an instructional unit. A broad, open-ended question can pique students' curiosity and focus interest on the main concept(s) to be introduced or expanded in the lesson. The question should never have a simple yes or no answer.

4.2: Vocabulary

With the emphasis on increasing reading level and assisting students with reading difficulties, it is useful to identify important vocabulary in the lesson that may be new to students. This vocabulary list will be a guide to students and a reminder to use selected vocabulary strategies to introduce these new words.

4.3: Reading Strategies

Anticipate issues related to student reading that may interfere with students achieving the performance task. Consider vocabulary, and pre-, during-, and post-reading strategies to assist students with reading comprehension essential for student learning. (Planning Tool: Reading Planning Worksheet)

4.4: Launching Activity

It is important to "hook" students into learning when beginning any new learning experience. Give additional thought to the first part of a lesson to try to heighten student interest in the learning. This might be done with a particularly dramatic video clip or demonstration. It might be an observation around the school or something that is important to students. Consider the interests and likes of students and create excitement for learning with an engaging launching activity.

4.5 Teaching Procedures

A good lesson clearly outlines the steps that you will take as facilitator. It lays out the sequence of steps that you will need to follow. However, it is also important to plan out the learning steps that students will need to take in completing the learning. These student-learning steps will help students sequence the work that they will do and know when they will be assessed. Learning steps communicate to students their responsibility in the learning process. (Planning Tool: Instructional Strategies Worksheet)

4.6 Formative Assessments

Formative assessments are teacher- or school-developed student assessments that are used during a lesson to give the teacher and student feedback on the progress the student is making toward achieving the performance tasks. Formative assessment might include determining whether students have acquired the knowledge necessary to complete the task or mastered sub-skills that will be used in completing the final performance. Formative assessments provide students with small stepping stones to make and measure learning progress during a lesson; they can increase the likelihood that students will confidently tackle and master the performance task.

4.7 Adaptations

Not every student will learn and progress through the lesson at the same rate. Make adjustments as you check students for understanding. Anticipate and plan for some of these adaptations by thinking through specific characteristics of the class or indi-

vidual students. Based upon those characteristics, consider adaptations in regard to reading materials, the use of technology, student work, and/or instructional strategies to address individual student characteristics and increase the likelihood of every student successfully mastering the performance task. (Planning Tool: Adaptations Planning Worksheet)

4.8 Resources

The last step is to make a list of student and teacher resources needed to carry out the learning experiences. This list is important for effective planning to ensure that all resources are available before instruction begins. It is also a useful juncture for thinking about instructional needs. If the required resources for a learning experience exceed the realistic capacity of the school or teachers, go back and revise the student work and strategies to make sure that they match the available resources.

Instructional Planning Forms

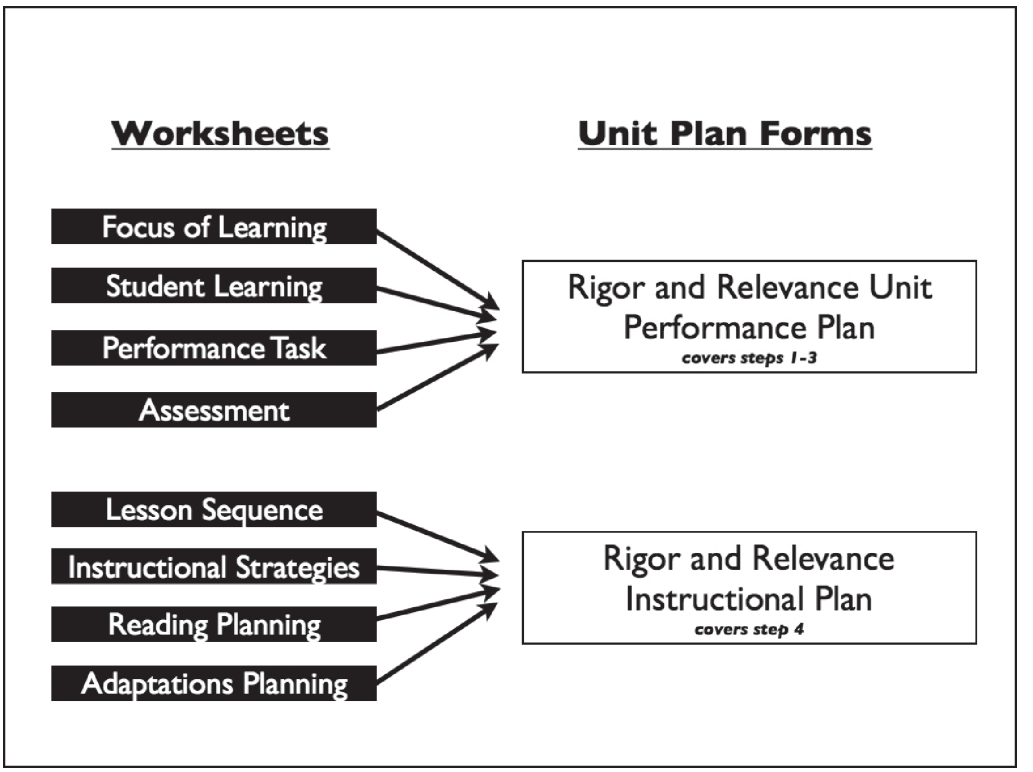
Included in this handbook and on the private website are forms and worksheets to assist you with instructional planning toward rigor and relevance. You will rarely use every form. Select the forms most appropriate for your planning and the aspect(s) of instruction you are seeking to improve. (Forms are available for downloading at: www.leadered.com/myrrhandbook.html)

The Rigor and Relevance Unit Performance Plan is used to summarize the first three steps of instructional planning *(define the focus of learning, create the student performance,* and *design the assessment)* culminating with a performance task and related assessment. Four worksheets guide the development of the unit performance plan:

- Focus of Learning
- Student Learning
- Performance Task
- Assessment

The Rigor and Relevance Instructional Plan summarizes step four**:** *develop the learning experience.* Four worksheets guide the development of the instructional plan:

- Lesson Sequence
- Instructional Strategies
- Reading Planning
- Adaptations Planning



FOCUS OF LEARNING WORKSHEET

Title

Focus of Unit	*Identify subject, course, unit, and students to be served and any specific project or theme for the lesson.*
Standards	*Link this lesson to state or national standards or the International Center's National Essential Skills Study (NESS).*

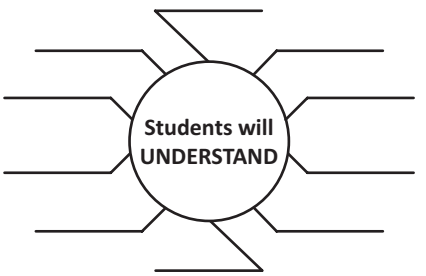
STUDENT LEARNING WORKSHEET

Title

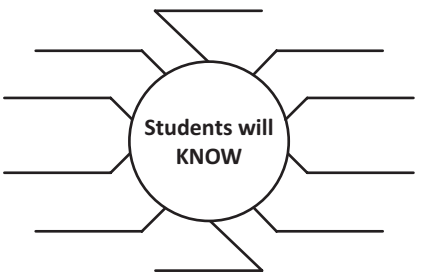
Student Learning

After reviewing the focus and related standards, brainstorm the concepts, knowledge, skills, and behaviors that students are expected to know and be able to do in this lesson.

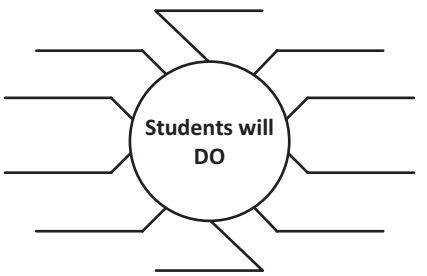
Concepts (Big Ideas)



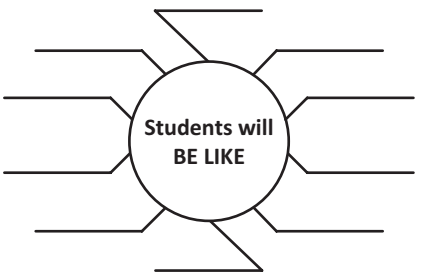
Declarative Knowledge



Skills



Behaviors



PERFORMANCE TASK WORKSHEET

Title

Rigor/Relevance Quadrant

Check expected level of R/R:

C ☐ D ☐

A ☐ B ☐

Student Learning

List the knowledge, skills, concepts, and behaviors students are expected to learn and be able to do in this lesson.

Concepts (Big Ideas)	**Declarative Knowledge**	**Skills (Performing and Thinking)**	**Behaviors (Work Habits)**

Student Work

Circle possible student work that would be used to demonstrate learning.

- Advertisement
- Audiotape
- Autobiography
- Banner
- Biography
- Brochure
- Business
- Cartoon
- Chart
- Children's book
- Coat of arms
- Collection
- Community service
- Composition
- Constitution
- Construction
- Contract
- Correspondence
- Crossword puzzle
- Debate
- Defense
- Demonstration
- Design
- Diagram
- Diorama
- Discussion
- Display
- Dramatization
- Drawing
- Editorial
- Essay
- Eulogy
- Evaluation
- Exhibit
- Experiment
- Fable
- Family tree
- Field guide
- Flag
- Game
- Graph
- Icon
- Interview
- Invention
- Joke
- Journal
- Letter
- Log
- Machine
- Magazine
- Manufacturing process
- Map
- Memo
- Memoir
- Mnemonic
- Model
- Mosaic
- Mural
- News report
- Newspaper
- Oral history
- Oral report
- Painting
- Petition
- Photo album
- Play
- Poem
- Poster
- Production process
- Proposal
- Puppets
- Questionnaire
- Questions
- Rap
- Relief map
- Research report
- Resume
- Rules
- Scale model
- Scrapbook
- Script
- Sculpture
- Shadow box
- Sketch
- Skit
- Slide show
- Software application
- Solution
- Song
- Speech
- Story
- Survey
- Taxonomy
- Teach a lesson
- Test
- Theory
- Time capsule
- Totem pole
- Videotape
- Website

Performance Task

Write a student performance task that will be the culmination of the unit. Select the appropriate student work, describe the specific context that relates the work to the desired learning, and list the conditions that will make this a high-quality learning experience.

ASSESSMENT WORKSHEET

Rigor/Relevance Quadrant

C☐ D☐

A☐ B☐

Title

Performance Task *Rewrite the full performance task or student work to be assessed.*

Type of Scoring Guide *Select the type of scoring guide:*

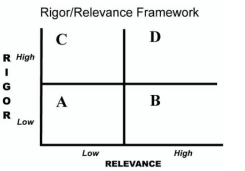
☐**Holistic** ☐ **Checklist** ☐**Analytic** ☐ **Mini-rubric**

Criteria *List major criteria that will be used to assess student performance.*

Scoring Guide *Draft the scoring guide for this performance task or reference an attached document.*

Rigorous and Relevant Unit Performance Plan

Title



Focus of Learning	*Identify subject, course, unit, and students to be served.*
Student Learning	*Identify concepts, knowledge, skills, and behaviors students will learn.*
Performance Task	*Describe the culminating student performance used to demonstrate learning.*
Standards	*Link this lesson to state or national standards or the International Center's National Essential Skills Study (NESS).*
Assessment	*Attach copies of the scoring guide or the rubric to assess the performance task.*
Exemplars (optional)	*Attach copies, descriptions, or images of exemplary student work.*

LESSON SEQUENCE WORKSHEET

Rigor/Relevance Quadrant

C☐ D☐

A☐ B☐

Title

Lesson Map	Illustrate a representation of the sequence of the lesson. Include performance tasks as the end destination. Show steps to arrive at destination include pre-tests, launching activity, individual learning experiences and formative assessments.
Teaching Procedure	Describe steps in moving students to the culminating performance.

INSTRUCTIONAL STRATEGIES WORKSHEET

Rigor/Relevance Quadrant

Check Expected Level of R/R

C☐ D☐

A☐ B☐

Title

Performance Task

Write the Performance Task for this Unit of Instruction

Strategies

Circle possible strategies that could be used in this lesson

- ○ Artistic expression
- ○ Brainstorming
- ○ Compare and contrast
- ○ Cooperative learning
- ○ Demonstration
- ○ Digital media production
- ○ Feedback and reflection
- ○ Games
- ○ Guided practice
- ○ Inquiry
- ○ Instructional technology – any time
- ○ Instructional technology – real time
- ○ Instructional technology – independent
- ○ Learning centers
- ○ Lecture
- ○ Logical and independent thinking
- ○ Manipulatives and models
- ○ Memorization
- ○ Note-taking/graphic organizers
- ○ Physical movement
- ○ Play
- ○ Presentations/exhibitions
- ○ Problem-based learning
- ○ Project design
- ○ Research
- ○ Service learning
- ○ Simulation/role playing
- ○ Socratic seminar
- ○ Storytelling
- ○ Summarizing
- ○ Teacher questions
- ○ Teaching others
- ○ Test preparation
- ○ Video
- ○ Work-based learning
- ○ Writing to learn

Launching Activity

Describe a beginning activity to generate student interest in the lesson and the strategies to be used.

Teaching Procedures

Revise the teaching procedures to include selected strategies

READING PLANNING WORKSHEET

Rigor/Relevance Quadrant

C☐ D☐

A☐ B☐

Title

Performance Task	*Rewrite full performance task or student work to be assessed.*
Vocabulary	
Vocabulary Strategies	Describe any strategies used to assist students in learning vocabulary.
Pre-Reading Strategies	Describe and strategies to be used prior to reading to build background knowledge and raise interest.
Post Reading Strategies	Describe and strategies to be used after reading to build comprehension.

ADAPTATIONS PLANNING WORKSHEET

Rigor/Relevance Quadrant

Title

C☐ D☐

A☐ B☐

Performance Task	*Rewrite the full performance task or student work to be assessed.*
Student Characteristics	• *Describe any unique characteristics of students.* • *Does the class include English Language Learners or students with disabilities?* • *What are characteristics of the entire class that will influence the lesson?*
Adaptation: Reading	*Describe any strategies used to adapt the lesson by offering differentiated reading levels.*
Adaptation: Technology	*Describe any adaptations using technology or different resources.*
Adaptation: Student Work	*Describe adaptations in requiring students to alternative work or allow student choices.*
Adaptation: Instructional Strategies	*Describe any alternative teaching strategies used to address any student's unique learning needs.*

RIGOROUS AND RELEVANT INSTRUCTIONAL PLAN

Rigor/Relevance Quadrant

Check expected level of R/R

C☐ D☐

Title

A☐ B☐

Performance Task	Write the Performance Task for this Unit of Instruction
Big Idea	Describe in the form of a statement or question terms, the enduring and important aspect of what students will learn.
Vocabulary	List and key vocabulary the student will be required to learn.
Reading Strategies	Describe reading and vocabulary strategies to be used during the lesson.
Launching Activity	Describe a beginning activity to generate student interest in the lesson.
Teaching Procedures	Describe the steps for teachers and/or students to the culminating performance.
Formative Assessments	Describe formative assessments that will be used during the lesson.
Adaptations	Describe modifications to meeting individual student needs.
Resources	List resource materials necessary for the lesson.

References

Wiggins, Grant and McTighe, Jay. *Understanding by Design.* ASCD, 1998

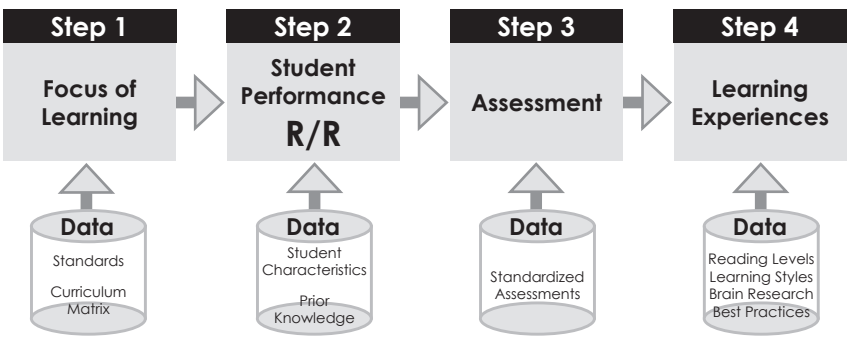
Chapter 3

Enhancing Instructional Planning

Data-Driven Instructional Planning

Instructional planning is most effective when teachers use both objective data and their own experience. In an era of increased accountability, teachers must use data to drive their decisions. The following chart shows the important data sources to use in each of the steps of the rigor/ relevance planning process.

Data-Driven Instructional Planning



Data Sources for Step 1

Standards Data

Teachers must focus on the "right" student learning. Schools have become standards-driven over the last two decades, using external standards developed nationally and/ or in their state. Standards provide educators with a comprehensive list of student learning upon which to base classroom instruction. Therefore, one data element is making sure that instruction is aligned to the appropriate standards. Many school

districts also create detailed pacing guides in a curriculum map, placing standards at each grade level on a timeline in which they should be covered. Suggested instructional experiences may also be provided to help students learn the standards.

Curriculum maps and pacing guides are excellent tools for ensuring that the standards are covered. They offer the advantage of providing teachers with comprehensive information on standards and help ensure that all teachers in the same grade level or subject move at a common pace. If a student transfers between classes or district schools, fewer gaps occur in that student's learning. The limitation of pacing guides is that they often reduce the flexibility of teachers to incorporate creative instructional ideas or tailor instruction to meet the needs of individual students. A better practice is to use curriculum maps and/or pacing guides as a reference on standards to be covered and encourage teachers to apply their own initiative to modify instruction that will meet students' needs.

When developing lessons, focus on groups of similar standards rather than a single standard. Teachers can look beyond their own discipline's standards for interdisciplinary connections and opportunities. This helps to reinforce student learning and use limited instructional time more efficiently.

Next Navigator Data

One of the issues with standards is the overcrowded curriculum, wherein the standards collectively exceed the capacity of schools to teach everything in each and every standard. Teachers need to set priorities, and it is important that teachers make these decisions based on data rather than personal preference. Such data includes which standards are most likely to be tested and which standards are most important and useful to students in the world beyond school.

States put together comprehensive standards documents with the implication that all standards must be covered and that all should be given equal importance when translating them into instruction. This often creates a school culture in which coverage of the topics takes precedence over learning experiences that result in a deepening of student knowledge and understanding.

All standards are not created equal. Some standards are more important than others. Teachers should understand this and give greater emphasis to priority standards in their teaching activities. Those standards that are less important might merely be covered while more important standards are extensively reinforced through greater application of learning and more challenging learning experiences.

In this era of state testing and accountability requirements, teachers place considerable emphasis on teaching to standards that are directly tested. In many cases, this results in the poor practice of teaching through test rehearsal and practice on released test items. Standardized tests are meant to be a sample measure of student learning of the standards. The assumption of state tests is that if instruction is based on standards, sampling through standardized test items should indicate the degree to which students are meeting the standards.

Some essential standards are not tested because they do not translate easily into a test format that can be administered on a large scale and scored efficiently and reliably. Learning experiences in which students are expected to write extensively or give verbal presentations that reflect high-level thinking are difficult to translate into multiple-choice questions. When focusing instruction primarily on state tests, teachers overlook opportunities to develop important standards that may not be tested. The large volume of state standards in every state makes it difficult for teachers to determine what to emphasize and what to consider less important.

The International Center for Leadership in Education collected public opinion as well as expert opinion from education and business industry for its National Essential Skills Study (NESS) to determine which standards (curriculum topics) are deemed most essential. The essential topics are correlated to each state's standards through the International Center's Next Navigator, providing a valuable resource for schools to determine which standards are of the highest priority. Decisions on what curriculum to emphasize should be made schoolwide and not left to individual teachers.

Data-Driven Curriculum Checklist

This checklist will help teachers make curriculum decisions that are based on objective data.

Standards

☐ Yes ☐ No Instruction is based on Common Core State Standards.

☐ Yes ☐ No Students and parents are informed at the beginning of the year that the Common Core State Standards are included in your course.

☐ Yes ☐ No Integration of academic standards into arts or career and technical education is focused on standards that are high priority and have a strong connection to the curriculum.

☐ Yes ☐ No You are familiar with the Common Core State Standards.

Student Characteristics

☐ Yes ☐ No You ask students about their interests and aspirations.

☐ Yes ☐ No You make home visits to meet parents and understand students' family situations.

☐ Yes ☐ No Instruction is differentiated to adjust for individual student differences.

Prior Knowledge

☐ Yes ☐ No Students' existing knowledge and skills levels have been determined.

Standardized Assessment

☐ Yes ☐ No You are familiar with standardized assessments required of your students.

☐ Yes ☐ No Your assessments are aligned to Next Generation Assessments.

☐ Yes ☐ No You take advantage of opportunities to develop student learning that is parallel to standardized assessments.

Reading Levels

☐ Yes ☐ No Reading levels that are necessary for competence on state tests have been determined.

☐ Yes ☐ No Reading levels of your students have been determined.

☐ Yes ☐ No You know the reading levels required for students' career goals.

Learning Styles

☐ Yes ☐ No Student learning styles have been determined.

☐ Yes ☐ No A variety of instructional strategies are used to respond to the diversity of student learning styles.

☐ Yes ☐ No Instruction is differentiated to adjust for individual students' learning styles.

Brain Research

☐ Yes ☐ No You teach in ways that are consistent with the latest brain research on student perception, processing, and knowledge retention.

Best Practices

☐ Yes ☐ No Teaching strategies have been researched and evaluated to determine their effectiveness.

☐ Yes ☐ No You analyze the effectiveness of your innovative practices through action research.

☐ Yes ☐ No You observe other teachers in your subject or grade.

☐ Yes ☐ No You observe teaching strategies in different settings, for example, watching a special education teacher for ideas on classroom management or a technical teacher for problem-based learning activities.

Data Sources for Step 2

Student Characteristics Data

Teachers do not plan instruction in isolation; they plan instruction with a specific group of students in mind. Student characteristics include cultural experiences, interests, and learning styles. What is the cultural background of your students? How many different cultures are represented? What experiences have students had at previous grade levels, in their families, in their activities? How many students are visual, auditory, or kinesthetic learners? Teachers should consider data on these characteristics to develop effective instructional plans.

Prior Knowledge Data

Prior knowledge data might be a formal assessment on curriculum and student achievement in prior grade levels. Prior knowledge could incorporate the socioeconomic and cultural background of students and what information and insights students have from their families and communities. For example, students from poor families may have little first-hand knowledge of geography from travel while wealthier student populations may experience travel to other states and nations. Prior knowledge can also take the form of a pre-assessment in which the teacher asks stu-

dents questions about content related to the intended learning in the unit. Teachers need to know the existing performance levels of students in order to provide new experiences that build on prior knowledge.

Data Sources for Step 3

Standardized Assessment Data

As teachers develop assessments for units of instruction, they need to be aware of state assessments that relate to student learning. For example, if the performance task requires students to write something similar to what is on the state test, teachers should use similar scoring criteria. In addition to state tests, teachers should also be aware of a broad range of assessments that may relate to their students depending on what they teach:

- Most postsecondary institutions require students to take entry tests to determine if students are prepared to do college level work.
- Teachers of Advanced Placement and International Baccalaureate programs need to align these curriculums with the comparable test.
- Teachers in career and technical education need to align these curriculums with the related industry certification tests.

Data Sources for Step 4

Reading Levels Data

Educators know how important reading is to continual learning. At the secondary level, reading should be the responsibility of teachers in all disciplines. Students improve their reading proficiency when they receive guidance in content areas. Teaching reading in the content area involves knowing and incorporating reading and vocabulary strategies into instruction. In addition, teachers can use reading data in planning instruction.

Teachers should know the reading levels of their students in order to select text that is appropriately challenging. If the material is at a much lower reading level than the students, they will become bored. More common is the assignment of reading materials that are far above the reading level of some students, who then fail to grasp the content and become discouraged.

One of the best open source measures of reading is The Lexile Framework® for Reading which measures the levels of reading materials and readers. It can help teachers identify textbooks and other materials at the appropriate level for students. An additional type of reading data for teachers is the level of reading proficiency that students need to attain in order to succeed in adult life. Knowing this information can help to motivate students to improve their reading to a specified goal. Using Lexile measures, teachers can find the measure required for proficiency in state examinations and for adult tasks, such as reading newspapers and income tax forms. The In-

ternational Center has analyzed hundreds of employee reading materials in various career clusters. They provide an accurate measure of reading required for working in various careers and help to set expectations for students of the specific level of reading they will need beyond school.

Learning Styles Data

Educators have become familiar with describing the unique characteristics of students in terms of learning styles. There are several schemes for categorizing learning styles; understand that students may not learn the same way that you do. Using a variety of learning experiences not only adds interest but also increases the likelihood that most students' learning preferences will be addressed. The learning styles data category includes characteristics such as sensory styles, perceptual styles, temperament styles, and multiple intelligences.

Brain Research Data

Current research has given teachers a better understanding of the brain and how it learns. As teachers design learning experiences, they should consider data about how the brain learns. Core principles for brain-based education include the following (Caine, G., Nummela-Caine, R., & Crowell, S. *Mindshifts: A Brain-Based Process for Restructuring Schools and Renewing Education*):

- The brain is a parallel processor; it can perform several activities at once.
- The brain perceives wholes and parts simultaneously.
- Information is stored in multiple areas of the brain; it can be retrieved through multiple memory and neural pathways.
- Learning engages the whole body. All learning is mind-body: movement, foods, attention cycles, and chemicals modulate learning.
- The human search for meaning is innate.
- The search for meaning comes through patterning.
- Emotions are critical to patterning; they drive our attention, meaning, and memory.
- Meaning is more important than just information.
- Learning involves focused attention and peripheral perception.
- We have two types of memory: spatial and rote.
- We understand best when facts are embedded in natural spatial memory.
- The brain is social; it develops better in concert with other brains.
- Complex learning is enhanced by challenge and inhibited by stress.
- Every brain in uniquely organized.
- Learning is developmental.

Best Practices Data

Teachers acquire effective learning approaches from experience and observations. With so many variables in schools, however, it is often difficult to predict whether a certain practice will work in a certain situation. Therefore, more emphasis is being placed on selecting instructional practices that are based on educational research. Teachers can expand their repertoire of strategies and student performances by reviewing the research and conducting action research on their own practice.

Using Instructional Technology

Importance of Technology

Every segment of our society, from finance to fast food, is driven by information and technology. Technology has also invaded our homes and personal lives. Every list of 21st-century skills emphasizes the importance of information and computer technologies. However, schools, in their insulated environment and with their limited budgets, have been slower to adopt informational technologies. Schools are not yet driven by data although signs of change are appearing. Due to accountability requirements as well as cheaper and easier-to-use devices, technology is steadily becoming more common in the school environment. Significant investments in technology are helping to bring the schoolhouse and teachers into the Information Age.

Computers, multimedia software, digital imaging, databases, and the Internet are changing education as we know it. Embracing technology and learning to use it effectively is one of a teacher's many challenges today.

In this handbook, we focus on technology applications that are used to plan and deliver instruction. Administrative applications of technology are also helpful in improving student performance. For example, technology can improve timely decision making through the use of individual student achievement data and knowledge of what the student has already learned. Technology enhances communication as e-mail, websites, electronic bulletin boards, homework hotlines, and voicemail give teachers the chance to share information conveniently with colleagues, parents, and students. Online testing offers great potential for testing students when they are ready and at multiple times.

Several of the ways that technology can produce a positive impact on achieving rigor and relevance are as follows:

- equalizing learning access
- increasing learning effectiveness and efficiency
- creating new learning opportunities

One of the lofty goals of U.S. public education is to equalize learning access. For example, technology offers great potential to make the same information available to all

students regardless of their location or size of the school library. The responsibility falls to teachers to expand student learning beyond the classroom walls and to advocate for the technology infrastructure, materials, and activities that expose students to high-quality learning experiences. Teachers must find ways to integrate these explorations through technology into their subject or grade. To enhance rigor, teachers can turn to the Internet for a large number of online courses and enrichment activities. For relevance, there is no better way to apply communication or research skills than to interact with scientists and a wide variety of other experts, government officials, and international students via the Internet.

Teachers always seek to increase learning effectiveness and efficiency. With many applications of technology, the learning objectives remain the same; students just have the tools to accomplish the objectives more quickly or to a higher performance level. Just as a carpenter today uses technology in the form of air-powered hammers to shingle a roof, the student writer uses word processing technology to write. Technology allows the carpenter to finish the job faster and better. Likewise, word processing allows the student to make edits more easily, check spelling, and create a more polished document. Student research is another objective accomplished more effectively with technology. Students learn to document sources and cite references in a virtual space as well as apply enhanced skills to identify credible sources from opinion or propaganda in the virtual world.

Another way to increase learning effectiveness is to create new learning opportunities, such as having students enhance their presentations and data analyses with graphics, charts, and images. The students of tomorrow may communicate ideas in visual form with audio background because of the ease of use of multimedia editing programs today.

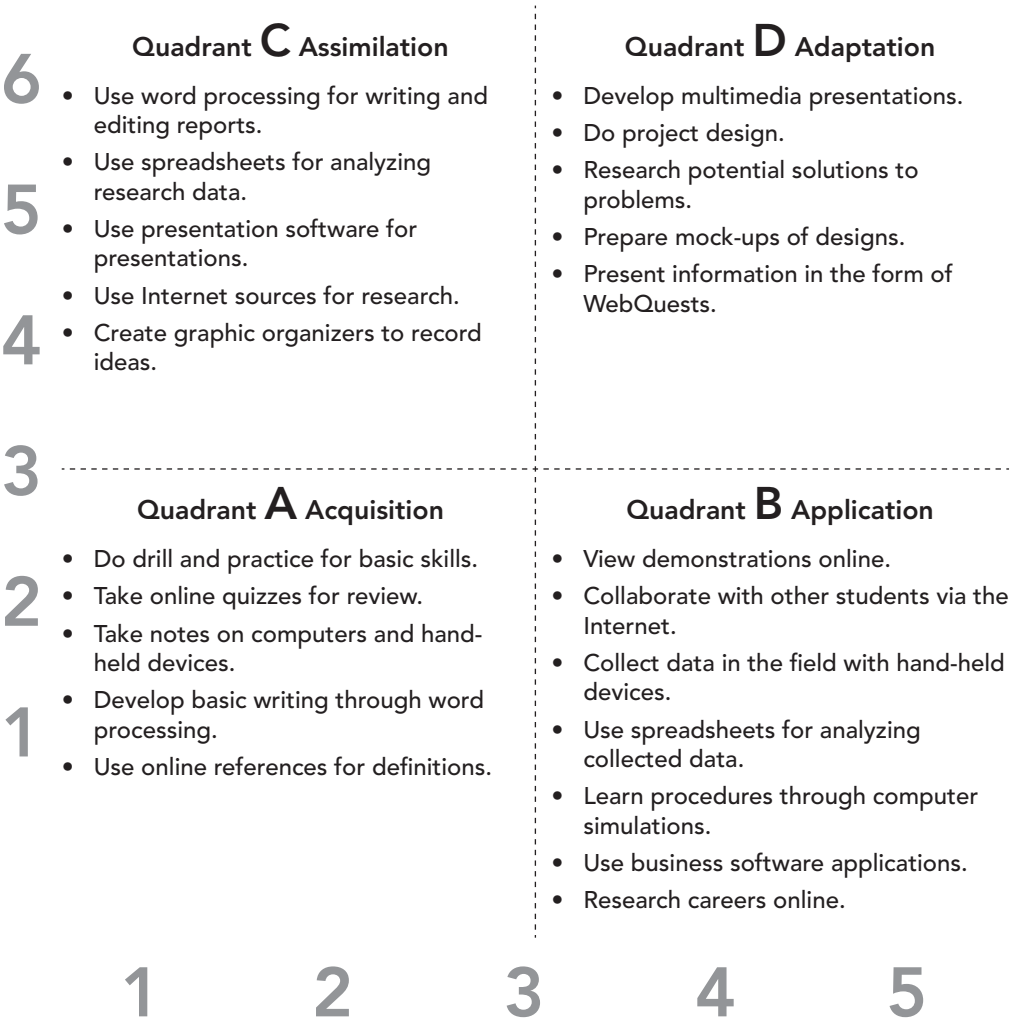
Technology and the Rigor/Relevance Framework

The degree to which technology is beneficial to learning depends on the way it is applied in the classroom and beyond. When used effectively, technology offers great possibilities for expanding learning beyond what schools have taught before. Technology puts vast amounts of knowledge at students' fingertips. Databases on every subject imaginable are available for study in all curriculum areas. Encyclopedias and complete collections of literary works reside on DVD. Telecommunication satellite links expand the walls of classrooms to encompass the world.

Technology provides teachers with a tool to create their own teaching materials, go beyond what is in the textbook, and organize information in new ways. Technology can be very helpful to teachers because it accommodates various learning styles and enhances instructional strategies in many ways.

The way in which technology is used can be linked to the quadrants of the Rigor/Relevance Framework. The chart Technology Applications for Rigorous and Relevant Learning that follows lists a few ways that students can use technology for learning in each quadrant.

Technology Applications for Rigorous and Relevant Learning



Interdisciplinary Instruction

Education should increase students' understanding of the interconnectedness of knowledge. Unfortunately, school subjects and courses are taught separately and disconnected from each other. As students move from class to class and grade to grade, they acquire bits and pieces of knowledge; however, no one teaches students how these pieces relate to each other.

Although in the real world people use knowledge from various disciplines in an integrated form, the U.S. education system has broken areas of knowledge apart into specialized studies. This fragmented approach is not an effective way to prepare students for life beyond school.

Integrating school subjects is a great way to add rigor and relevance, and it costs little — no new textbooks, no additional equipment, and no bureaucratic reorganization or retraining of teachers. Often, all that is required of teachers is a change of attitude and the willingness to restructure instruction so that it prepares students for life, not just for more school. With some understanding of how skills are used outside the educational establishment, an interdisciplinary curriculum can be put into place that is vastly superior to the current regimen of a separate curriculum for each subject.

The ultimate objectives of education are to provide students the following:

- **foundation knowledge** for dealing with the real world
- **skills** to succeed in their various adult roles
- **the ability to continue to learn**

An interdisciplinary curriculum is a more natural way to achieve these objectives than the present curriculum. Unfortunately, many educators and other adults whose perceptions of education have been structured by traditional schooling have difficulty recognizing the efficacy of the interdisciplinary curriculum.

The problem is not that an interdisciplinary curriculum is complicated to deliver but rather that it is different. It demands a paradigm shift in thinking. Consider how long it took to gain popular acceptance for the idea that a sunrise was a consequence of the Earth's rotation rather than the sun's movement. People often resist change. They are wedded to their perceptions of how things are "supposed to be."

Once teachers recognize the importance of developing interdisciplinary learning experiences, they may find it difficult to create such experiences because they have neither the information nor the planning time. Textbooks and teacher guides rarely show relationships among subject areas.

Teachers can, however, use a planning process that encourages the incorporation of cross-disciplinary ideas and activities in the instructional strategies selected. In addition to subject-matter expertise, most teachers also have accumulated knowledge and developed interests in other areas. They also have access to other teachers with

different subject-matter concentrations. Using these resources, teachers can construct lessons with interesting relationships among the disciplines.

Giving students opportunities to explore interconnections among the subjects they are studying has many advantages. Interdisciplinary instruction adds meaning and relevancy to learning as students discover applications among disciplines. New perspectives are developed that help students construct a more integrated web of knowledge. This integrated knowledge structure not only facilitates learning new information but also helps students appreciate the wealth of information and ideas they already possess.

One of the best strategies for bringing relevance to the classroom is for teachers to think beyond the walls of the school to community resources. Communities offer a wealth of opportunities for learning through application. Manufacturing plants, retail and wholesale businesses, hospitals and clinics, local government agencies, and not-for-profit organizations are gold mines of technical reading materials, situations requiring good communication, scientific phenomena, and problems in search of solutions. Teachers can make site visits or convene meetings of community leaders to brainstorm ideas.

Some business leaders are willing to spend time in schools explaining to students the application of skills or posing real-world problems for them to solve. Elected officials, service organization leaders, recent graduates, and senior citizens can help to identify learning opportunities in the community.

Another way schools can greatly enhance teaching and learning is by creating partnerships with the community. Examples of partnership activities include mentorships, experiential learning opportunities, and co-investigations whereby students and community members solve problems together.

Designing an Interdisciplinary Lesson

Generally, interdisciplinary lessons do not concentrate on the mastery of specific skills. By their very nature, these lessons typically focus on the application of skills and knowledge in new contexts. For this reason, the goals of interdisciplinary lessons usually involve helping students understand how the skills and knowledge they possess can be combined to accomplish a task, discover a solution, or explain a situation.

Select the content that will serve as the basis for instruction. Often, the textbook determines the content base. Many times, however, your goal will necessitate the use of ancillary materials. In any case, determine the primary vehicle that will drive the instruction (e.g., a work of art or literature, a scientific or mathematical principle, or an event or era in history).

Through talking with colleagues and brainstorming on your own, identify events, discoveries, and writings within other disciplines that relate to the content base in a meaningful way. At this point, you may find it helpful to look at the table of contents in textbooks you may be using. However, do not discount your own expertise, films or plays you have seen, books or magazine articles you have read, and your life experience.

Determine the key points of intersection between disciplines that correspond to your established terminal goal of instruction. As you investigate each cross-disciplinary idea in more depth, keep that goal well in mind. Do not become enthralled by the idea itself and lose sight of the major instructional intent. Some ideas will probably need to be discarded, either because they are too complex or because they do not fully address the goal. Other ideas may be so compelling and enlightening that you may revise the terminal goal to reflect new insights you have gained.

Identify the prerequisite skills and knowledge that students must possess in each discipline. Interdisciplinary instruction can fail if students lack knowledge of key concepts within each discipline. Consider carefully the skills students must have before they can accomplish the objectives you have set forth. Sometimes you can teach needed skills or pieces of information rather quickly. However, when this is not the case, revise the interdisciplinary content.

Select instructional strategies that will compel students to combine their knowledge from several disciplines. Students are not used to activating their knowledge in one discipline while studying another. For this reason, develop activities that cross the boundaries of disciplines in a purposeful way. Conceptual mapping, in-class debates, group projects, and a variety of discovery techniques are examples of ways to accomplish this objective. As in all instruction, the critical component of interdisciplinary lessons is active and invested participation by students.

Thematic Instruction

Thematic instruction is the organization of curriculum around major themes that integrate several disciplines in the exploration of a broad topic, such as communities, rain forests, Native American culture, or the use of energy. This method of instruction is especially popular at the elementary level because it incorporates several standards or objectives into one engaging activity.

Thematic instruction supports the belief that we learn best when we acquire knowledge in the context of a coherent "whole" and when we can connect what we are learning to the real world. Thematic instruction seeks to put the learning of such cognitive skills as reading, mathematics, the scientific method, and writing in the context of a real-world topic that is both specific enough to be practical and broad enough to allow creative exploration.

Thematic instruction most frequently involves teachers at the same grade level working as a team to design instruction and assessment around a theme. At any level, thematic instruction is a useful tool for integrating the curriculum and eliminating the isolated, reductionist nature of teaching around disciplines rather than experience.

Initially, thematic instruction requires some creative design work and substantial restructuring of teacher relationships and class schedules. Themes often involve a large, integrated system (e.g., a river basin, city, or rain forest) or a broad concept (community, democracy, or transportation).

Opportunities for Interdisciplinary Instruction

The following examples can stimulate thinking about areas for interdisciplinary instruction.

- Develop thematic units that involve the study of a variety of aspects in different disciplines.
  - **Example:** World War II — economics, literature, cultures, geography, and aerospace technology
- Parallel teach, whereby two teachers cover related topics at the same time in separate classrooms.
  - **Example:** wave theory in physics and communication systems in technology
- Team teach a unit in which each teacher brings a particular expertise.
  - **Example:** culture of the 1960s — music, politics, and literature
- Help students create projects that include elements of mathematics, science, and technology.
  - **Example:** a bridge design
- Use a standard scoring guide across all subjects.
  - **Example:** a scoring guide with the same criteria that is used by teachers in all subjects to evaluate student writing
- Supervise students as they complete a community service project.
  - **Example:** restoring a town park or playground
- Bring in outside speakers to talk about their jobs/careers.
  - **Example:** a journalist who covers current events in social studies might also discuss the use of language and editing skills
- **K–12 Suggestion:** Plan a field trip for students (live or virtual) where learning is rarely limited to one discipline.
- **High School Suggestion:** Partner academic teachers with career and technical education teachers to work together to infuse more academics into technical courses and to add real-world projects into academic courses.

Efforts are often made to connect the theme to the students' everyday lives. In some cases, students participate in choosing the theme.

Teachers organize the learning objectives of their core curriculum (both process skills and content knowledge) around the theme. In the study of a river basin, for instance, mathematics might involve the calculation of water flow and volume; social studies may include the nature of river communities; science topics may involve phenomena such as weather and floods; literature might include nonfiction and novels that are river focused, such as the work of Mark Twain. Designing the thematic unit requires considerable work. Again, sometimes students are involved in designing the curriculum.

Allocating instructional time can involve changes in the class schedule and new combinations of classroom hours, field trips, team teaching, and use of outside experts. Because thematic instruction is often project oriented, it may involve presentations to the school or community. Extensive visual displays are also common. Be sure to identify the kinds of recognition students will receive.

Gold Seal Lessons

The Successful Practices Network's Gold Seal Lessons provide excellent teaching ideas and a practical solution to the real challenge of increasing the rigor and relevance of instruction for all students. Gold Seal Lessons are activities that are strategically designed to teach to specific academic standards, performance indicators, objectives, and/or benchmarks. These standards are assessed by high-stakes state and national tests and then used to evaluate individual student, school, and district education effectiveness.

Each Gold Seal Lesson is centered on a highly motivating theme, activity, or project. The lessons are almost always multidisciplinary and deal with real-world situations or problems. Each lesson is keyed to a quadrant on the Rigor/Relevance Framework and includes a scoring guide to assess learning progress.

A lesson may take as little time as one class period or as much time as one year to complete. The task may run concurrently with other class activities, or it may be the exclusive activity for a period of time. Students sometimes work individually, but more frequently they accomplish the task in a small work group.

Gold Seal Lessons require students to learn and perform in a number of ways. The student may research, write, compute, model, demonstrate, build, survey, or report in a variety of academic, technical, work, and community environments.

Gold Seal Lessons:

- ensure academic rigor and prepare students for success after school
- are keyed to state standards and prepare students for high-stakes testing
- are multidisciplinary and can point the way to effective collaboration among faculty members
- can be stockpiled by the school, district, or even state in resource banks to provide a plentiful source of ideas for teaching state standards
- are challenging, fun, and engaging to students

Review the sample Gold Seal Lesson on pages 89–92.

Sources of Gold Seal Lessons

Gold Seal Lessons are available for purchase in print products or online databases. Refer to the International Center's website (www.LeaderEd.com) for print versions of Gold Seal Lessons for your grade level and subjects. Online versions of Gold Seal Lessons are available from the Successful Practices Network at www.successfulpractices.org.

Planning with Gold Seal Lessons

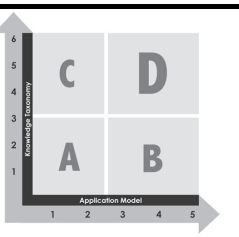
A Gold Seal Lesson becomes the end goal of a unit of instruction. It is a creative teaching idea, anchored in standards, that completes the first three steps of the planning process. Teachers can then move quickly to Step 4, developing the learning experiences.

Most teachers will want to adapt Gold Seal Lessons to some degree. Pause and think about the first three steps of rigor/relevance instructional planning. First, reflect on the focus of learning and determine where the lesson fits into your curriculum. Review the standards and essential skills to make the link to appropriate state standards. Teachers may choose to add or subtract a standard or two from this list, but the beginning printed list of standards makes a good starting point. Then, review the performance task and related assessment. Is this performance task appropriate for your students? Will the assessment provide an accurate way to assess student learning? Make modifications as necessary.

When planning the learning experiences in Step 4, start with sequencing the lesson. Gold Seal Lessons give your students a clear destination to complete the unit of instruction and accomplish what is important to learn. The planning task is to identify the steps for the teacher and students, the strategies, and the formative assessments to move toward the performance task destination, as described in Chapter 2.

Rigor/Relevance Instructional Planning Steps

- Define the focus of learning.
- Create the student performance.
- Design the assessment.
- Develop the learning experiences.

GOLD SEAL LESSON	Persuasive Speech/Writing Project
Subject(s) Speech, Writing, English Language Arts, Home and Careers **Grade Level** 9–12	**Rigor/Relevance Framework** 
Common Core State Standards	**Reading:** 1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. **Writing:** 1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. 7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation. **Speaking and Listening:** 4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience. **Language:** 1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. 2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
Student Learning	• Students communicate successfully as members of a small work group for the purpose of researching and clarifying ideas for effective persuasive communication. • Students' skillful integration of information, ideas, rhetorical techniques, and strategies is evident in the success of speeches to persuade a specific audience for a specific purpose.
Performance Task	**Overview** Working in small groups, students will design and tabulate a survey on the student body's opinions of the lunch menu. The small groups will follow up the survey with research on nutritional guidelines for school hot lunch programs. After groups have shared the information they have gathered with the class, individual students prepare and deliver persuasive speeches meant to sell a food service program to the school district. **Description** • Students form small groups to discuss what is favorable and unfavorable about the current hot lunch program. • Each group designs, conducts, and tabulates a survey that will indicate what menus are the most and least popular with the student body. • Each group presents the results of the survey to the class. After all presentations, the class compares/contrasts the results of each group's findings. • Groups will meet again to research nutritional guidelines for school hot lunch programs. The group will write a sample 5 day lunch menu that is based on their research. • Students receive direct instruction on ethos, logos, and pathos. • Individual students begin to brainstorm ideas, draft, revise, and practice their persuasive speeches selling the improved food service program to

Performance Task (con't.)	the school community. • Students present their persuasive speeches to the audience. If possible, arrange for a panel, including an administrator, board member, parent, and student to ask questions and evaluate speeches.
Assisting English Language Learners	Before starting this project, make sure that English Language Learners understand the instructions. If necessary, break the directions down into simple steps. Check for comprehension by asking the students to explain the directions back to you in their own words. Likewise, give students essential vocabulary in advance. Words such as *needs*, *wants*, *persuade, appeal*, *support*, *survey*, *audience*, and *nutrition* are important for understanding the project. Work with students to define the words, and help them draw pictures or use visuals to represent the words. Alleviate oral presentation anxiety by allowing students to present in groups, present a poster or visual, or read from written notes.
Essential Skills	E1 Apply writing rules and conventions, (grammar, usage, punctuation, sentence structure, and spelling). E8 Prepare and deliver individual speeches that address the needs of the target audience by gathering information, rehearsing, making eye contact, speaking loudly enough, and delivering information in a well-organized fashion. E7 Research information from a variety of sources and draft a well-organized, accurate, and informative report or essay that engages an audience and addresses its needs. E9 Organize supporting detail in logical and convincing patterns that focus on audience and purpose. E14 Write clear and concise directions or procedures. E6 Collect and focus thoughts about the writing activity (brainstorming, listing, drafting, etc.). E18 Apply rules of appropriate diction and grammar in formal and informal speaking situations. E10 Participate in (sometimes leading) one-on-one or group discussions by asking questions, asking for clarification, taking turns speaking, agreeing and/or disagreeing courteously, making informed judgments, and working toward a common goal. E33 Define a position on a controversial topic and write an essay to persuade a specific audience to change an opinion or take a particular action. E36 Define a position on a controversial topic and make an oral presentation likely to persuade a specific audience to change an opinion or take a particular action. E32 Evaluate the logic and organization of technical or other nonfiction texts for clarity and effectiveness in describing a set of directions or procedures. E22 Use a variety of organizational formats (compare/contrast, cause/effect, inductive/deductive, most important to least important, and least important to most important) that support the purpose of a writing activity. E43 Identify and interpret idiomatic expressions and figures of speech that enhance oral communication.
Attachment	An Improved Food Service Program: Activity Guide

Submitted by: Toni Hood, Fort Dodge Senior High School

Scoring Guide

	4	3	2	1	Score
Persuasive Technique	Appeal is highly persuasive.	Appeal is persuasive.	Appeal lacks persuasive qualities.	Fails to deliver appeal.	
Clarity	Makes a clear appeal designed to win the lunch program contract.	Makes a clear appeal designed to win the lunch program contract.	Purpose is hinted at but is not readily apparent.	Does not attempt to sell the food service program.	
Information	Is fully supported with appropriate factual information.	Is supported with factual information.	Provides minimal support.	Support was insufficient or inaccurate.	
Strategies and Techniques	Makes expert use of rhetorical strategies and techniques.	Makes use of rhetorical strategies and techniques.	Shows little awareness of rhetorical strategies and techniques.	Does not use rhetorical techniques or strategies.	
Voice and Gestures	Effectively uses voice and gestures to impress the audience and keep them engaged.	Uses voice and gestures to connect with the audience.	Speech lacks expression and fails to connect with the audience.	Speech may be inaudible or too short, or both.	

Improved Food Service Program: Activity Guide

A successful persuasive speech appeals to the needs and wants of the audience. That takes time, effort, and research.

You are a representative for Nutrition for You Food Service Company. As a customer service representative, you need to discover the needs and wants of the school community, communicate those needs to the company, and work with the nutrition and culinary team to design a hot lunch program that meets both the nutritional and financial needs of the school community. Your final challenge is to persuade representatives from the district to award the Nutrition for You Food Service Company the contract to provide the hot lunch program for their schools.

Group Project

Many of the tasks will be part of a group project. Your group should consult the list below to keep your team focused and on schedule:

- Design a survey for the purpose of discovering what menus are the most and least popular with the student body.
- Administer the survey to the student body.
- Tabulate the survey.
- Present the results of the survey to the class.
- Research nutritional guidelines for school hot lunch programs.
- Design a sample 5-day lunch menu that is informed by your research as well as research reported by other groups.

Now You Are on Your Own

- Brainstorm ideas, and then draft, revise, and practice your persuasive speech selling the company's service to the school community.
- Give your speech pitching your company's lunch proposal. Keep in mind that the lunch proposal must satisfy the needs of the entire school community. Your speech should be written for a panel that will include a school administrator, a board member, a parent, and a student.

Be prepared to answer questions. Be ready to sell.

References

Caine, G., Nummela-Caine, R., & Crowell, S. *Mindshifts: A Brain-Based Process for Restructuring Schools and Renewing Education,* 2nd edition. Tucson, AZ: Zephyr Press, 1999

Chapter 4

Selecting and Developing Local Assessments

Types of Assessment

Various types of assessments are used to measure what a student knows and is able to do. A conscious effort to mirror instruction in assessment enhances the student's ability to perform.

The eight most frequently used types of assessment are described below. The chart Relationship of Assessments to the Rigor/Relevance Framework correlates assessment types to the framework. On that chart, the assessments listed as "primary" are the best match for that quadrant. Secondary assessments are also appropriate but are less closely matched.

1. Multiple Choice

Multiple-choice tests include items with a stem in the form of a question and four or five possible answers from which the student chooses the correct one. True-or-false questions are a simplified variation of multiple choice. The stem is in the form of a statement, and the answer choices are limited to two: true or false. A more complicated variation is a matching question, which lists a number of stems in a group with each one having a match in a group of related answers. The common characteristic of all multiple-choice questions is that the correct answer is given and the student only needs to choose wisely.

2. Constructed Response

Constructed-response questions are also known as short-answer questions. The stem calls for the writing of a term or short phrase for the answer. Sometimes these questions are presented as fill-in-the-blank sentences calling for the correct word.

3. Extended Response

In extended-response questions, sometimes called essay questions, the student must develop the answer. Questions for extended response are open ended and require a more detailed explanation than just a phrase or sentence. In addition to knowing the answer, the student must be able to develop a logical, well-written response.

4. Process Performance

Process performance requires the student to produce some work: write a paper, give a presentation, or complete a task. In process performance, the focus of the assessment is on the process taken to complete the work. The evaluation of health care workers, for example, may be based on process performance to determine if all safety procedures have been followed.

5. Product Performance

Product performance is similar to process performance in that the student produces some work to be assessed. The difference is that the evaluation criteria focus on the finished product. For example, a work of art is judged not on the process used to create it but rather on the final result.

6. Portfolio

A portfolio is a collection of examples of student work. It often includes work that has not been assessed or labeled with a grade. It may also include other forms of assessments. The collection of work is reflected on by the students and/or presented to others for their judgment of quality.

7. Interview

In an interview, the student's knowledge is determined by posing questions for oral response. There may or may not be specific criteria upon which the responses are scored.

8. Self-Reflection

Self-reflection differs from other forms of assessment because there is no external judge of the work. The student assesses his or her work individually using a set of criteria.

Relationship of Assessments to the Rigor/Relevance Framework

Primary = Best Match **Secondary = Also Appropriate**

Quadrant C Assimilation

Primary
- Extended Response
- Product Performance

Secondary
- Process Performance
- Constructed Response
- Portfolio
- Self-reflection
- Multiple Choice

Quadrant D Adaptation

Primary
- Portfolio
- Product Performance
- Interview
- Self-reflection

Secondary
- Extended Response
- Process Performance

Quadrant A Acquisition

Primary
- Multiple Choice
- Constructed Response

Secondary
- Process Performance
- Extended Response
- Self-reflection

Quadrant B Application

Primary
- Process Performance
- Product Performance

Secondary
- Interview
- Constructed Response
- Multiple Choice
- Portfolio
- Self-reflection

6 5 4 3 2 1

1 2 3 4 5

Designing Performance Assessments

Performance-based assessments are an excellent way to learn whether students understand concepts and can apply their knowledge. Students may know all the facts but be unable to understand the connections between those facts or how to use them. Many students learn by rote, with little understanding of why, or they draw erroneous conclusions about why.

Effective performance-based assessments ask students to explain their work. As the students begin to justify their answers, they start to reflect more on their own learning and take more responsibility for ensuring that they really understand why, not just what.

Performance-based assessment involves gathering evidence about how students think, what connections they are making, and what strategies they use to solve problems. Performance-based assessments make instruction more effective because they are rich in clues about how students learn. They help teachers know how and what to teach.

Performance-based assessments differ from traditional multiple-choice or fill-in-the-blank tests in several ways. With performance-based assessments, student performance is compared to a set standard rather than against the performance of other students. Connections and higher level cognitive skills are easier to assess than with objective tests.

Moreover, traditional tests have an element of surprise. Students, and even the teacher in the case of standardized state and national tests, never know what questions will be asked. With performance-based assessment, students know exactly what is expected of them. They have the scoring guide ahead of time, so they know exactly what the assessment will cover.

Criteria and Scoring Guides

In a performance task, the descriptions of the knowledge and skills that define what is required are called criteria. These criteria describe precisely what the student is expected to know and be able to do.

While a standard is a general statement of an end goal, criteria provide specific details that can be used to create tasks to teach and assess each student's ability to meet that standard. The criteria form the basis of the scoring guide.

Defining criteria for complex tasks is not easy. It involves analyzing what is essential in the task as performed by the real-world expert, not merely what a student must do to complete the task. There are typically qualitative differences in performances as one becomes more proficient.

Criteria help students formulate a working definition of what is considered "expert performance" and why. Using the criteria, teachers can work with students to develop a scoring guide for a task that describes what is "competent" or "highly proficient." Such discussions help students understand how to become "experts" themselves.

Valid scoring guides reflect the relative importance of each aspect of that thinking and decision making. If the final report is not the heart of the task, it should not be given the same weight as the aspects of the task and the skills that are central to what students are supposed to be learning.

Criteria remove the mystery from assessment. Everyone knows from the beginning exactly what a student must do to excel. Students often refer to the scoring guide as they work through the task.

Parents find the scoring guide helpful too because they can support what their children are doing and talk with them about their progress in detail.

Collaborating with other teachers on scoring guides is very helpful. Each teacher brings student work to share. If the teachers can agree that a few of the samples are "expert" (or 4, or however the top level is designated), then they can discuss what specific evidence of student knowledge and skills makes those papers expert. Next, they look through the work that represents "competent" performance and describe the specific evidence accepted for that level. Typically, teachers go back to the descriptions already written to modify them.

Teachers who have used scoring guides for several years report that they revisit their guides at least annually. They also create new scoring guides with their students and have lively conversations about standards. Students who have been using scoring guides for several years tend to be far more reflective about their work, with the result that their teachers find that a 4 for a class a year ago is a 3 or even a 2 now.

Reliability

In order for an assessment to be considered reliable, it should predict reasonably well how a student will perform on another comparable task. For example, if students are able to analyze a mathematics task involving ratio in one instance, they should be expected to solve similar problems on other tests.

Reliability depends in part upon the *comparability* of tasks. It is fairly simple to create comparable tests for the recall of information. It is far more difficult to predict a student's performance on real-life, multifaceted tasks; there are too many variables. At the same time, performance-based assessments are a more solid measure of what students know and can do.

A second important aspect of reliability in performance-based assessments is inter-rater reliability, or the ability of different teachers to score a performance task in the same way. If several teachers are using the same task, everyone should be in close agreement on what "competent" or "highly proficient" means. Developing inter-rater reliability takes much discussion about what "competent" looks like. It also takes well-written scoring guides.

Validity

Validity is a measure of how closely a performance assessment mirrors the knowledge and behaviors that are required to perform comparable real-life tasks.

Quality performance assessments require hands-on learning, but they go beyond "doing" to require considerable thought and decision making by the student, as well as organization of relevant data, problem solving, and thoughtful habits of mind.

In order for the assessment to be valid, students must understand the task. Traditional testing programs view teachers as proctors who must not explain the meaning of a word or coach a child who does not understand the directions. With performance-based assessments, teachers are expected to interact with students and provide whatever assistance is required to understand the task.

The teacher controls many aspects of the performance task that determine whether the assessment is valid. Assessment tasks should be handled in the classroom to ensure that each student's actual performance is being assessed. Once work leaves the room, it could be someone else's work.

The teacher also decides whether to permit students to collaborate or work independently. Either option may be valid, depending on the assessment goal. If students work collaboratively, the criteria should include descriptions of expected group behavior. Be clear about what aspects of the project can be done together and what must be done independently. For example, students might collect data or perform an experiment together but then write their own conclusions individually.

Types of Scoring Guides

Scoring guides can be designed in many formats. There are four basic types: holistic, checklist, analytic, and mini-rubric.

Holistic is the simplest of the four formats. It is often used when the person judging the performance is extremely knowledgeable of quality performance. Usually, there are a few broad categories. Each category is given a maximum point value, and the evaluator assigns a specific number of points to each measure. A total score is then given to the performance. This is similar to the judging of athletic or musical performances.

The *checklist* generally has a longer list of items than the holistic category. The evaluator checks off the items that were completed satisfactorily. Typically, no values are given to a performance, only a record of items completed. This type of scoring guide is best suited to performances in which the process is critical or when specific steps or safety procedures must be followed.

The *analytic* scoring guide is the most popular for performance tasks. The analytic scoring guide uses several broad categories. For each category, specific criteria describe the highest and lowest levels of performance and several levels in between. Analytic scoring guides can be developed and refined to evaluate student performance on a consistent and accurate basis.

Mini-rubrics are typically a combination of a checklist with one analytic criterion, resulting in a simple, easy-to-use assessment.

Examples of various scoring guides follow.

Sample Holistic Scoring Guide 1

This scoring guide is used to evaluate student performance in doing a presentation on an issue.

I. Speak		
Delivery	5 3 1	Eye contact with entire audience
	5 3 1	Voice loud and clear
	5 3 1	Appeared at ease
	5 3 1	Seemed to care about topic
Organization and Content	5 3 1	Well researched
	5 3 1	Both main ideas and details present
	5 3 1	Material clear and concise
	5 3 1	Material includes both pro and con aspects of the issue
	5 3 1	Long-term consequences discussed
	5 3 1	Creative in use of phrases and words
Language	5 3 1	Very few "uh" "um" "like"
	5 3 1	Avoided clichés and using same words repeatedly
	5 3 1	Sounded impartial; both sides given equal time and enthusiasm
	5 3 1	Arguments persuasive
II. Collaborate		
Works Toward Group Goals	5 3 1	Does fair share
	5 3 1	Initiates change when necessary
	5 3 1	Both leads and follows
Communication and Interpersonal Skills	5 3 1	Both talks and listens as situation requires
	5 3 1	Open-minded about other members' views
	5 3 1	Attempts to understand all points of view
	5 3 1	Answers questions objectively or commits to finding answer
III. Portfolio		
Content	5 3 1	Two summaries of articles dealing with issues
	5 3 1	Correctly formatted citation for each article on summary page
	5 3 1	Note cards for oral presentation
	5 3 1	Self-evaluation
	5 3 1	Evaluation of other group members
Writing	5 3 1	Word choice
	5 3 1	Ideas and content
	5 3 1	Conventions
	5 3 1	Voice

Sample Holistic Scoring Guide 2

The following is an example of a holistic scoring guide to evaluate student work in creating a product and presentation.

Distinguished (95-100 points)	• Outstanding work, fully meets all requirements • Exhaustive coverage • Completely understands problem and has ability to apply data to the solution • Shows originality
Highly Proficient (90–94 points)	• Excellent work, meets all requirements of task, good breadth • Well planned and documented • Shows fine understanding and ability to apply data to the solution of the problem • Shows evidence of creativity
Proficient (80–89 points)	• Fine or good work, meets requirements of task • Good breadth of coverage, fairly well planned and documented • Shows a good understanding and ability to apply data to the solution of new problems • Could show more evidence of creative thinking
Suggests Proficiency (70–79 points)	• Fair work, meets many requirements of the task • Fair breadth of coverage with some gaps • Shows uneven understanding with some ability to apply data to the solution of the problem • Needs to fill gaps
Suggests Lack of Proficiency (65–69 points)	• Uneven work, meets some requirements of the task • Poor breadth of coverage with a number of gaps in coverage • Little understanding and ability to apply data to problem solving • Needs to improve in significant areas
Lacks Proficiency (below 65 points)	• Poor work, meets few if any requirements of the task • Little or no breadth of coverage • Little understanding and makes no significant attempt to apply data to solution of the problem

Sample Checklist Scoring Guide

The following is an example of a checklist scoring guide to evaluate student performance on a project.

I.	**Directions** (25 Points)	
	In sequential order	_____/5 Points
	Clearly understood	_____/5
	Neatly typed	_____/5
	Graphic illustrations	_____/5
	Product described or identified	_____/5
II.	**Poster Advertisement** (25 Points)	
	Lettering neat	_____/5
	Message clear	_____/5
	Logo and company name clear	_____/5
	Artistic use of color	_____/5
	Good use of space	_____/5
III.	**Business Letter** (25 Points)	
	Full block style	_____/5
	Information clear	_____/5
	Grammar clear	_____/5
	Signature included	_____/5
	Margins and form followed, letter is typed	_____/5
IV.	**Video Commercial** (25 Points)	
	One minute in length	_____/5
	Message clear	_____/5
	Voice easily understood	_____/5
	Background appropriate	_____/5
	Script sells product	_____/5
TOTAL		**_____/100**

Sample Analytic Scoring Guide 1

This example of an analytic scoring guide rates student performance on a writing project on a scale where 4 is the highest mark.

Narrative Writing

4 The composition shows an excellent understanding of narrative writing. It includes seven or more details to support the main idea and has a distinct beginning, middle, and ending. The paper sticks to the topic with a logical plan and sequence. It is well elaborated and easy to understand.

3 The composition shows a reasonable understanding of narrative writing. It includes five or more details to support the main idea and has a beginning, middle, and ending. It sticks to the topic most of the time but might have some unrelated details. The paper has a reasonable plan but may have a few ideas out of sequence and may be lacking in elaboration.

2 The composition shows a slight understanding of narrative writing. There are three to four details which support the main idea. The paper lacks one of the following: beginning, middle, or ending. Some ideas do not relate to the topic, or the paper sticks to the topic but does not elaborate enough.

1 The composition shows a lack of understanding of narrative writing. There is evidence that the writer has read the prompt and has attempted to respond to it. However, the paper does not stick to the topic. There is no evidence of a beginning, middle, or ending, and the composition does not make sense.

0 The composition is unreadable, or there is no response.

Impact of Narrative Writing

4 The story catches the interest of the reader within the first paragraph. The story keeps the reader interested throughout the writing. The story promotes curiosity and/or suspense.

3 The story catches the interest of the reader within the first or second paragraph. The story keeps the reader's interest throughout two-thirds of the writing. The story promotes some curiosity and/or suspense.

2 The story catches the interest of the reader within the second or third paragraph. The story loses the reader's interest halfway through the story or earlier. The story promotes very little curiosity and/or suspense.

1 The story has an uninteresting beginning. The story fails to grasp the reader's interest. The story arouses no curiosity or suspense.

0 The story makes no sense, or there is no response.

Sample Analytic Scoring Guide 2

This analytic scoring guide is used to evaluate student performance on a piece of creative writing.

Ideas and Content: What is the overall effect of the paper? Does it include examples that develop the main points or purpose?

5 _____ Fluent, richly developed; clear awareness of task; original, insightful, or imaginative; details are relevant.

4 _____ Fluent, fully developed; clear awareness of task; solid; details are relevant.

3 _____ Moderately fluent; awareness of task; ideas developed but limited in depth; details are generally relevant.

2 _____ Thinly developed; some awareness of task; repetitive or too general; important details are omitted.

1 _____ Poorly developed; poor awareness of task; lacks clarity; details are merely listed; repetitious/too few details.

Organization: Paper is focused and clearly and logically ordered.

5 _____ Carefully organized from beginning to end; clear focus; has topic sentence and closure.

4 _____ Well organized from beginning to end; clear focus; has topic sentence; may lack closure.

3 _____ Organized with minor lapses in order or structure; focus may wander; may lack a topic sentence or closure.

2 _____ Focus unclear; lacks organization and good transitions; shifts point of view; lacks topic sentence and closure.

1 _____ Unfocused; thought patterns are difficult to follow; shifts point of view; lacks topic sentence and closure.

Sentence Structure: Sentences are complete, correct, and varied in structure and length.

5 _____ Sentence variety enhances style; no errors in structure; successfully uses sophisticated sentence patterns.

4 _____ Sentence variety is appropriate to style; few errors in structure; moderate success with sophisticated patterns.

3 _____ Some sentence variety; some errors in structure; attempts at more sophisticated patterns not totally successful.

2 _____ Little sentence variety; errors in structure interfere with meaning; overreliance on simple/repetitive constructions.

1 _____ No sentence variety; serious errors in structure; too brief to demonstrate variety.

Word Choice: How is the paper's vocabulary, word choice, and usage?

5 _____ Rich, effective vocabulary; accurate and vivid language; overall correct usage.

4 _____ Generally successful in using rich language; generally correct usage.

3 _____ Acceptable vocabulary; attempts to use rich language; generally correct usage.

2 _____ Simplistic vocabulary with limited word choice; numerous errors in usage.

1 _____ Simplistic vocabulary; inappropriate/incorrect word choice; numerous usage errors.

Mechanics: How is the paper's spelling, punctuation, capitalization, paragraphing?

5 _____ No mechanical errors relative to length/complexity; title when appropriate; paragraphing throughout.

4 _____ Few mechanical errors relative to length or complexity; paragraphing good.

3 _____ Some mechanical errors that do not interfere with communication; uneven paragraphing.

2 _____ Some mechanical errors that do interfere with communication; poor paragraphing.

1 _____ Serious mechanical errors that do interfere with communication; no paragraphing.

Total _____ **x 4 =** _____ **Total Score**

Sample Mini-Rubric Scoring Guide for English Language Arts Grades 3–5 (Fairy Tale Retelling)

Written/Oral Presentation Mini-Rubric *Check the correct column where evidence of drawing, telling, or writing was noted.*			
	Yes/Complete	**In Part/Almost**	**Not Yet**
A hero			
A sequence			
A problem			
A lesson			
Fairy tale language			
Oral Presentation Analytic Rubric *Circle one response.*			
4 Expression and pace were excellent.	**3** Came up to the front of the classroom, made eye contact, and finished.	**2** Needed help to complete the task.	**1** Unable to complete the task because:

Chapter 5

Teaching for Rigor and Relevance

Instructional Strategies

Selecting Instructional Strategies

Teachers can select and plan a series of varied activities that enable students to develop and demonstrate the expected skills and knowledge for the instructional unit. As students engage in these activities, their work should be evaluated using specific objective criteria. The activities must be consistent with the levels of rigor and relevance as well as closely connected to the identified student work and performance task.

Most teachers instruct from their own experience, replicating the models of good teaching they have previously experienced. However, this approach may not work for all students. A lesson is only as effective as its measure in student achievement. In some cases, students may not understand the content because of the manner in which the information is delivered. In each learning environment, teachers must search for effective strategies that, when coupled with their own expertise, lead to greater student learning.

The appropriateness of a particular instructional strategy in a given situation can be determined by matching the characteristics of the strategy, the learner, and what needs to be learned. Teachers should be familiar with many instructional strategies so that they can confidently select the best strategies for each situation.

Thirty-six instructional strategies are defined in the following pages. While each strategy is listed independently, the strategies are rarely used independently. When creating units of instruction, teachers generally combine several strategies. For example, a lecture may precede a demonstration and ultimately lead to a problem-based exercise.

The Rigor/Relevance Framework is useful in selecting appropriate strategies. In the chart Instructional Strategies and the Rigor/Relevance Framework, the 36 strategies are rated for their appropriateness to each quadrant of the framework. A three-star rating indicates a strategy that is most appropriate for that quadrant of learning. Two stars mean the strategy is suitable, and one star indicates that the strategy is less than ideal for the quadrant. Remember that the strengths of each strategy help to create effective instructional experiences.

Definitions of Instructional Strategies

These 36 instructional strategies are described in detail in the International Center publications *Effective Instructional Strategies — Volume I* and *Effective Instructional Strategies — Volume II.*

Artistic expression is producing visual, dramatic, or musical performances to express ideas, thoughts, and concepts.

Brainstorming stimulates thinking and allows students to generate vast amounts of information and then sort that information in an engaging learning process.

Compare and contrast is analysis to identify similarities and differences among objects, ideas, people, and events.

Cooperative learning places students in structured groups to solve problems by working cooperatively.

Demonstration involves direct observation of physical tasks, such as the manipulation of materials and objects.

Digital media production involves expressing knowledge, ideas, and concepts in the form of digital audio, video, and animation.

Feedback and reflection mean teachers direct student learning by giving feedback, checking for understanding, and/or encouraging reflection.

Game is a structured activity that engages students in individual or group competition to demonstrate knowledge or complete an academic task.

Guided practice refers to homework, worksheets, and computer practice in which students solve routine problems to reinforce concepts or skills.

Inquiry engages students in posing questions around an intriguing investigation, making observations, and discussing them.

Instructional technology — any time is using Internet-connected digital technology for asynchronous interactive learning, including web browsing, wikis, blogs, and social networking tools.

Instructional Strategies and the Rigor/Relevance Framework

	Quadrant A Acquisition	Quadrant B Application	Quadrant C Assimilation	Quadrant D Adaptation
Artistic expression	★★	★★	★★★	★★★
Brainstorming	★★	★	★★★	★★★
Compare and contrast	★★	★	★★★	★★
Cooperative learning	★★	★★★	★★	★★★
Demonstration	★	★★★	★	★★
Digital media production	★★	★★★	★★	★★★
Feedback and reflection	★★	★★	★★★	★★★
Games	★★★	★★	★	★
Guided practice	★★★	★★	★★	★
Inquiry	★	★★	★★★	★★★
Instructional technology—any time	★★	★★	★★★	★★★
Instructional technology—real time	★★	★★★	★★	★★
Instructional technology—independent learning	★★	★★★	★★★	★★★
Learning centers	★★★	★★★	★★	★★
Lecture	★★★	★	★★	★
Logical and independent thinking	★★	★★	★★★	★★★
Manipulatives and models	★★★	★★★	★★★	★★
Memorization	★★★	★★	★★	★
Note-taking/graphic	★★	★★	★★	★★
Physical movement	★★	★★★	★★	★★
Play	★	★★	★★★	★★★
Presentations/exhibitions	★	★★	★★	★★★
Problem-based learning	★★	★★★	★★	★★★
Project design	★	★★★	★	★★★
Research	★★	★	★★★	★★★
Service learning	★	★★★	★★	★★★
Simulation/role playing	★★	★★★	★★	★★★
Socratic seminar	★	★	★★★	★★★
Storytelling	★★	★★★	★★★	★★★
Summarizing	★★	★★	★★★	★★
Teacher questions	★★	★	★★★	★★★
Teaching others	★★	★★★	★★	★★★
Test preparation	★★★	★★	★	★
Video	★★	★★★	★★	★★
Work-based learning	★★	★★★	★★	★★★
Writing to learn	★★	★★	★★★	★★★

Instructional technology — real time is using Internet-connected digital technology for group instruction, including interactive whiteboards, computers, and portable devices.

I**nstructional technology — independent learning** means a multimedia computer application that provides a choice of learning paths and enables the tailoring of programs to student questions or interests.

Learning center is an area set up in a classroom for short activities to focus on developing a particular skill and/or concept while working individually or in cooperative groups.

Lecture is a verbal presentation of knowledge by the teacher to the students, often supplemented by visuals and handouts.

Logical and independent thinking is thinking deeply about an issue, taking a point of view, developing a logical argument, and defending a position.

Manipulatives and models are concrete, tangible objects students create or use to facilitate understanding.

Memorization is rehearsal for the recall of facts using techniques for remembering information, including mnemonic devices.

Note-taking/graphic organizers involve organizing logical notes for reference and using graphics, diagrams, and symbols to represent information.

Physical movement includes developing exercise habits as well as incorporating movement into intellectual activities to enhance learning.

Play is voluntarily engaging in intrinsically motivated, unstructured activities that impart joy, self-expression, and experimentation in which rules and goals are influenced by interpersonal interaction and imagination.

Presentation/exhibition is an oral presentation requiring students to organize ideas and express them in their own words.

Problem-based learning introduces concepts through the use of problem-solving skills on a real problem or investigation.

Project design requires students to integrate their skills and knowledge to create their own literary, technological, or artistic work, as individuals or in a group.

Research means students locate and retrieve information from several sources, such as library references, textbooks, other individuals, and electronic databases via the Internet.

Service learning involves learning opportunities in which students perform unpaid work that contributes to learning and adds value to the community.

Simulation/role playing replicates the way skills and knowledge are used outside school, ranging from role playing to computer-generated virtual reality.

Socratic seminar combines the elements of teacher questions, inquiry, and discussion around key topics, with the teacher asking probing questions as needed.

Storytelling is students conveying events, ideas, or concepts in words, images, and sounds through improvised narration.

Summarizing is restating the essence of a text or an experience in a new concise form in as few words as possible while still conveying accurate meaning.

Teacher questions stimulate significant student thinking in response to thoughtful queries about connections with new information.

Teaching others allows students to deepen knowledge through peer teaching or teaching younger students.

Test preparation is acquiring generic strategies for analyzing test questions and rehearsing knowledge to enhance performance on high-stakes tests.

Video provides students with new information and builds background knowledge through audio/visual presentations ranging from full-length commercial movies to short information or news segments.

Work-based learning presents opportunities for students to learn through on-the-job experiences ranging from job shadowing to full employment.

Writing to learn makes students organize their knowledge and reinforces concepts in any form from short quickwrites to multi-page research reports.

Teacher Questions by Quadrant

C

Ask questions to summarize, analyze, organize, or evaluate:

- How are these similar/different?
- How is this like ____?
- What's another way we could say/explain/express that?
- What do you think are some reasons/causes that ____?
- Why did ____ changes occur?
- How can you distinguish between ____?
- What is a better solution to ____?
- How would you defend your position about ____?
- What changes to ____ would you recommend?
- What evidence can you offer?
- How do you know?
- Which ones do you think belong together?
- What things/events lead up to ____?
- What is the author's purpose?

D

Ask questions to predict, design, or create:

- How would you design a ____ to ____?
- How would you compose a song about ____?
- How would you rewrite the ending to the story?
- What would be different today if that event occurred as ____?
- Can you see a possible solution to ____?
- How could you teach that to others?
- If you had access to all the resources, how would you deal with ____?
- How would you devise your own way to deal with ____?
- What new and unusual uses would you create for ____?
- Can you develop a proposal that would ____?
- How would you have handled ____?
- How would you do it differently?

A

Ask questions to recall facts, make observations, or demonstrate understanding:

- What is/are ____?
- How many ____?
- How do/does ____?
- What did you observe ____?
- What else can you tell me about ____?
- What does it mean ____?
- What can you recall ____?
- Where did you find that ____?
- Who is/was ____?
- In what ways ____?
- How would you define that in your own terms?
- What do/did you notice about this ____?
- What do/did you feel/see/hear/smell ____?
- What do/did you remember about ____?
- What did you find out about ____?

B

Ask questions to apply or relate:

- How would you do that?
- Where will you use that knowledge?
- How does that relate to your experience?
- How can you demonstrate that?
- What observations relate to ____?
- Where would you locate that information?
- Calculate that for ____?
- How would you illustrate that?
- How would you interpret that?
- Who could you interview?
- How would you collect that data?
- How do you know it works?
- Can you show me?
- Can you apply what you know to this real-world problem?
- How do you make sure it is done correctly?

Note: Quadrants B and D involve students "doing" as well as answering questions, but these questions help move students toward increased relevance.

Reading Strategies

An increasing number of students struggle to read and comprehend textbooks that are designed for proficient high school readers. This fact is well recognized by teachers everywhere. What may not be so widely accepted, however, is the notion that content area teachers can assist struggling readers. This does not mean that these teachers should become reading teachers. However, it does mean that they can structure lessons to assist struggling readers.

While content area teachers often are the first to recognize the problem of inadequate reading skills, most feel unprepared to address the issue because they lack training in teaching reading. Moreover, with the increasing pressures of proficiency testing, they are concerned that reading instruction will take time away from the primary subject they are responsible for teaching.

How can teachers help students face the challenges of reading to learn? What are the habits and skills of effective readers in middle and high schools? The answers lie in teaching reading strategies that engage students in content, maintain their focus, and improve their understanding and application of what they have read. When students have appropriate skills to complete the task before them, strategic reading can occur.

Students who are strategic readers are able to demonstrate a repertoire of strategies automatically, independently, and in a variety of ways. Effective readers use these cognitive processes and strategies competently and unconsciously in order to achieve academically. These strategies affect the processing of text, enhancing the ability of the reader to retrieve, remember, and use the material.

Teachers need to assist students in learning how to use strategies intuitively, so students can move from being frustrated novices to competent readers. Each task needs to be tackled with knowledge of the following:

- the type of reading material being encountered
- the purpose of the reading task
- the demands of the specific type of content
- available strategies for the reader to use

Before-, During-, and After-Reading Approaches

Following a framework of before-, during-, and after-reading approaches or strategies helps teachers give students a clear idea of what they need to accomplish to become successful lifelong readers. The before-, during-, and after-approaches contain the following strategic elements.

Before Reading

For more information, see the International Center publication *Effective Instructional Strategies for Content-Area Reading 7 –12.*

- **Activating background knowledge.** Students are taught to elicit prior knowledge of the reading topic. They build a background relating to what they already know.
- **Investigating text structure.** Students are taught to analyze the text before them: its print features, the layout, and illustrations. They are taught to consider the language and the literary features of the text. They learn to discriminate between narrative and expository text.
- **Setting a purpose for reading. S**tudents are taught to ask themselves why they are reading the material. After students determine their own purpose for reading, they can better select a reading style that suits the purpose. They decide whether to skim, scan for specific information, or read and reread to recall details. They are also taught to question the author's purpose in writing the selection.
- **Predicting the text content.** Students are taught how to form ideas about what is going to happen in the text. They are taught how to combine and use the information they are reading to make meaningful guesses about the material.
- **Reviewing and clarifying vocabulary.** Students are taught how to use word-solving strategies to pronounce a word correctly and understand its meaning.

During Reading

During the reading process, students establish the purpose for each part of the text. Students are taught to ask themselves why they are reading a particular text — whether it is to retell, answer questions, gather information, make comparisons, or learn the main idea.

- **Self-monitoring.** Students are taught to check for understanding while they are involved in the reading process. They ask themselves if what they are reading makes sense. They learn how to self-correct to monitor their own accuracy.
- **Visualizing.** Students are taught how creating mental images helps them construct details to better comprehend material.
- **Summarizing.** Students are taught to stop and think during their reading to answer who or what they are reading about and where the action is taking place.
- **Confirming or rejecting predictions.** Students are taught how to revise predictions made before reading by using the information gathered during their reading. They are taught how to locate evidence to confirm or reject the predictions they made.

- **Identifying and clarifying key ideas.** Students are taught how to reflect on information, ideas, and words as they read. They learn how to think about what they are reading. They learn to reread for clarity and distinguish between important and less important information contained in the text.
- **Questioning.** Students are taught to use the text to answer different questions posed by the teacher. They learn to distinguish between literal, inferential, and critical types of questions.

After Reading

- **Assessing if the purpose was met.** Students are taught how to think back to the before-reading process, decide if the purpose was met, and figure out what to do if they did not accomplish the goals.
- **Paraphrasing.** Students are taught how to interpret and restate the author's ideas using information from the reading and their own knowledge. They are taught to rewrite the main ideas in their own words.
- **Identifying main ideas and details.** Students are taught first how to identify facts or ideas that are relevant to understanding and then how to use that information to select the primary focus of the text.
- **Making comparisons.** Students are taught how to compare and contrast information within a text and between texts. They are taught how to look for similarities and differences.
- **Connections.** Students are taught how to draw on their own experiences to help clarify the text. They connect to experiences or relationships to further construct meaning.
- **Drawing conclusions.** Students are taught how to use text or visual clues, in addition to the information they already have acquired, to come up with a conclusion.
- **Summarizing.** Students are taught how to give a brief statement about the main parts of the text, story, or chapter. They are taught to extract and organize the important information gained from their reading.
- **Analyzing.** Students are taught to make judgments about what they read and to support their opinions using explicit information from the reading.

The before-, during-, and after-approaches to reading are an important part of a lesson or unit design. Anticipate reading issues in planning rigorous and relevant instruction and include strategies that will increase your students' reading comprehension.

Quadrant D Moments

Teaching to Quadrant D — high rigor and high relevance — does not have to mean large projects that take long periods of time. While those "big" projects are effective learning, once teachers understand the Rigor/Relevance Framework, they can use

short teaching strategies within a single class period to raise the level of rigor and/or relevance. The following examples plus the List of Quadrant D Moments give teachers ideas of ways they can extend their instruction into D-Moments.

Teaching Others: Grade 3 Mathematics

At the end of the lesson, the teacher has students partner and stand back to back. The teacher gives them a moment to think about what they have learned. They must turn and face their partner at a bell tone and take turns "teaching" the other person what they have learned. The teacher has students pretend that their partner is a younger student who has no knowledge of the mathematics lesson. Students must help their partner learn the material.

What If?: High School British Literature

While learning about prominent historical figures, students discuss the decisions and choices the figures made and things that happened beyond their control. One such example is the reign of Mary I, Queen of England. She married Phillip II of Spain and wanted a child to seal the two countries together and make England a stronger Catholic country. They never had a child and ultimately Elizabeth became Queen and the country became Protestant. The teacher poses the questions: "What if Mary I and Phillip II had born a son?" "What language would we speak?" "Would we have a national religion?" "Would the pilgrims have ever come here if they had religious choice in their country?"

Program Your TV: High School Economics

View a television show that provides commentary on the U.S. economy and suggest what should be done to improve it. Summarize what the show is about and give your opinion on how the economy should be improved, citing at least one economic principal and one government role.

List of Quadrant D Moments

Original Ideas: Ask students to create an original way to display knowledge and relate it to how something is organized in business, school, the community, or the world.

Teaching Others: Work in pairs or small groups for re-teaching or reinforcing.

Current Events: Connect content to current events.

Inquiry: Set up intriguing real-world investigations for students to propose questions.

Did You Know?: Have students calculate new and interesting facts, such as the miles a baseball team travels in a season.

Google It: Use Internet search engines to answer student questions.

How Did That Happen?: Use cause-and-effect analysis to determine why a phenomena, event, or action occurred in our world.

Remind Me: Have students develop a real-world metaphor for complex content to help them remember relationships, rules, patterns, and criteria.

Program Your Television: Relate and explain a TV show, movie, music, or other media to what students are learning.

Can You See It Now?: Translate numbers into visible, tangible objects to more deeply understand quantities, e.g., the size of sod houses in pioneer times.

Storytelling: Put content knowledge into fanciful stories to remember knowledge.

Quiz Show: Design a game show to test peer application of knowledge.

Future Think: Make predictions of the future based on scientific or historical knowledge.

Summarizing: Express in concise form the key points from reading or a teacher or student presentation, and relate it to their lives or the future.

Why Questions: Pose "why" questions on content related to students' lives or the future.

Lego Land: Create a manipulative object to represent a concept in a lesson.

At Your Service: Have students identify a simple act or service that would help their school, neighborhood, or community.

Analyze It: Analyze work or other real-world materials, documents, or technology against a key question.

Justify Your Position: Have students take a position on a real-world issue that impacts someone they know and then justify it.

Write to Learn: Have students write one to five minutes at the beginning, middle, or end of a class several times a week. Through writing, students pose questions, discover answers, check understanding, and stimulate discussion.

Teaching for Student Engagement

With the strong focus on meeting expectations in state assessments and the many distractions for youth today ranging from iPods and instant messaging to family issues and socioeconomic standing, many schools are concerned about the increasing number of disengaged students. This concern has brought student engagement to the front burner, where it needs to stay if we want all students to achieve the skills and knowledge that will provide the basis for success and fulfillment throughout their lives.

Once students are engaged, they have confidence to take action and are more likely to enroll in rigorous courses that apply higher-order thinking skills to real-world, unpredictable situations. They begin to make connections from one content area to the next, and learning becomes both rigorous and relevant. Moreover, students engaged in the pursuit of academic success not only are learning information in a more productive fashion, but they also are learning how to apply that information and apply themselves to the learning process.

Student engagement is the positive behavior that indicates full participation in the learning process. When students are engaged, we can hear, see, and/or feel their motivation in completing a task, taking pride in their work, or going beyond the minimum work required. Engaged students demonstrate a feeling of belonging by the way they act, the positive things they say about school, and their passionate involvement in class activities.

Experienced educators know that increasing student engagement is not easy. How many times have teachers — as well as parents and other adults — heard students say, "Why do I need to learn this stuff?" Unfortunately, answering the question by saying they will understand the reason later in life does little to encourage student engagement.

Student engagement is not about students complying with rules and the absence of poor behavior. True engagement is more than behaviors; it is about students being engaged with their heads and their hearts.

The three domains of student engagement unfold in Engagement-Based Learning and Teaching (EBLT) as follows:

- Cognitive domain consists of beliefs and values.
- Emotional domain consists of motivation and feelings.
- Behavioral domain consists of habits and skills.

Simply telling or encouraging students to engage themselves in their classwork is seldom enough. Instead, designing and delivering high-rigor and high-relevance lessons will increase student engagement. Most students like to be challenged and quickly become bored with routine work. More important, creating highly relevant lessons helps students see where they can apply and use newly acquired skills and knowledge, which leads to engagement.

Teaching for high rigor and high relevance can be part of the solution to addressing engagement issues. Engagement-based learning and teaching requires developing and strengthening schoolwide practices that cultivate beliefs, values, feelings, motivation, behavioral habits, and skills at the crux of successful student engagement. Teachers need to build relationships, develop trust, establish routines, and select active learning strategies that lead to increased, long-lasting engagement. For more information, see the International Center publication *Learner Engagement for Academic Success*.

Chapter 6

Improving Instruction Through Rigor and Relevance

Reflective Practice

Although teachers are responsible for their own improvement, schools and school leaders can do a great deal to support teacher improvement efforts. The school culture has an enormous effect on teacher behavior and efforts to improve.

To enhance teaching and learning, teachers need to be given the time, opportunity, and incentive to reflect critically and analytically on what they are doing, why they are not doing, and why. This reflective practice is a tool for teachers to improve and become more effective educators.

Developing reflective practice strengthens teaching. Teachers must frequently make judgments with limited information and background on curriculum, needs of individual students, methodologies, and district goals. A teacher who is a reflective decision maker derives joy in investigating the teaching/learning process.

Many variables contribute to effective instruction. The characteristics of effective learning experiences are as unique and varied as each student who makes up a class. This factor makes it impossible to identify a standard prescription for improving teaching and learning. What works with one student or group of students may be unsuccessful with others.

Teachers can make improvements by relying on a variety of sources, including the advice of other educators, validated successful practices, and education research studies. This chapter contains descriptions of some approaches that teachers and school leaders have found that support school improvement.

Internet Resources for Teaching Ideas on Rigor and Relevance

The expansion of the Internet in the last decade has created an exciting new avenue for teachers to collaborate, share ideas, and research information for lessons. No longer do teachers need to struggle in isolation.

English Language Arts

Community Learning Network. Instructional resources and student project ideas around English language arts themes
www.cln.org/subject_index.html

EDSITEment. Teaching resources for the humanities
http://edsitement.neh.gov/

Internet4Classrooms. Technology-based resources in English language arts
www.internet4classrooms.com/lang_mid.htm

Literacy and Learning Reading in the Content Areas. Resources for middle school teachers to support reading in other content areas
www.lpb.org/education/classroom/itv/litlearn/

National Council of Teachers of English. Resources integrating literacy and technology, integration with other courses
http://www.ncte.org/

ReadWriteThink. A joint project of the National Council of Teachers of English (NCTE) and the International Reading Association (IRA) to provide the highest quality practices and resources in reading and English language arts instruction
www.readwritethink.org/

Interdisciplinary

AMSER: Applied Math and Science Education Repository. A two-year college level resource, yet many materials are applicable to high school
http://amser.org/

Classroom, Inc. Simulations for student collaboration in the development of literacy and math skills through an interdisciplinary approach
www.classroominc.org/?page=our_programs&subpage=simulations

The Concord Consortium. A nonprofit education research and development organization that creates interactive materials for information technologies
www.concord.org/

Curriculum21. Networking site for teachers to share ideas on 21st-century curriculum, interdisciplinary lessons, and the application of Web 2.0 tools
http://curriculum21.ning.com/

ENC. Integrated units in math and science from this extensive clearinghouse
www.goenc.com/

Eduscapes. Ideas across content areas and courses for projects, problems, and inquiry
http://eduscapes.com/tap/topic43.htm

Edutopia. Resources and case studies on project-based learning
www.edutopia.org/integrated-studies

HippoCampus. A project of the Monterey Institute for Technology and Education (MITE) providing multimedia content to high school and college students on general education subjects
www.hippocampus.org

Illinois Math and Science Academy. Integrated math and science units, project-based learning
http://pbln.imsa.edu/

Internet4Classrooms. Extensive resource of online data for student projects and problems
www.internet4classrooms.com/project.htm

InvenTeams. An initiative by the Massachusetts Institute of Technology (MIT) to foster inventiveness among high school students
http://web.mit.edu/inventeams/about.html

Khan Academy. Extensive list of math and science resources; many are lower levels of rigor useful for tutorials and building background knowledge
http://khanacademy.org/

PBL Projects. Resources for technology-infused and project-based lessons across content areas
www.wested.org/pblnet/exemplary_projects.html

USA Today. Extensive activities and lesson plans for real-world applications of math, science, English language arts, and the development of career skills
www.usatodayeducate.com/wordpress

Mathematics

Computing Technology for Math Excellence. Links and ideas for math-based projects
www.ct4me.net/math_projects.htm

The Geometer's Sketchpad. Dynamic tool to explore and understand math concepts
www.dynamicgeometry.com/

National Council of Teachers of Mathematics' Illuminations. Online activities linked to NCTM standards, along with lesson plans and other web links
http://illuminations.nctm.org

National Library of Virtual Manipulatives. Over 100 interactive simulations developed as a means for accelerating and deepening students' understanding of math
http://nlvm.usu.edu/en/nav/vlibrary.html

Texas Instruments. Resources for using graphing calculators in a wide variety of math and science activities
http://education.ti.com/educationportal/sites/US/productCategory/us_ graphing.html

Tools for Understanding. Resources to assist math teachers at a variety of skill levels; includes using journaling to help students think in different and creative ways
www2.ups.edu/community/tofu/home.htm

Science

Agriscience Fair. Guidelines for student research projects in agriscience fields
www.ffa.org/documents/agsci_handbook.pdf

Exploratorium. Museum resources for demonstration and inquiry
www.exploratorium.org

ExploreLearning. Online inquiry environment that includes interactive simulations where experiments are performed
www.explorelearning.com/

Forensics Files on truTV. Forensic case studies for high school science classrooms
www.courttv.com/forensics%5Fcurriculum/

Freezeray. Bank of imaginative, highly visual teaching aids for use with interactive whiteboards
www.freezeray.com

The GLOBE Program. Hands-on science projects where students collect, analyze, report, and publish data with students around the world
www.globe.gov

Human Body Explorer: Discovery Channel. Animated resource for students to explore human systems
http://dsc.discovery.com/tv/human-body/explorer/explorer.html

Interactive Simulations. Interactive online simulations from the University of Colorado at Boulder for dozens of science concepts
http://phet.colorado.edu/simulations/index.php

Kitchen Chemistry. Practical chemistry investigations from MIT's OPENCOURSEWARE initiative course on kitchen chemistry
http://ocw.mit.edu/OcwWeb/Special-Programs/SP-287Spring-2009/CourseHome/

National Oceanic and Atmospheric Administration. Earth science resources
www.noaa.gov

Nanokids. Information and activities to understand the nanoscale world and emerging research
http://nanokids.rice.edu

NASA Practical Uses of Math and Science. Examples from NASA of how science and math are used in interesting settings and everyday life
www.nasa.gov/audience/foreducators/index.html

Project Learning Tree. Environmental materials in forests, wildlife, water, planning, waste management, and energy
www.plt.org/

Project WILD. Environmental learning about the natural world emphasizing the conservation of wildlife
www.projectwild.org/

Science WebQuests. Extensive list of inquiry-based science WebQuests
www.chemistryteaching.com/scwquest.htm

SciLinks. Sponsored by the National Science Teachers Association (NSTA), lesson resources with many linked to textbooks
www.scilinks.org

TeachEngineering. Lessons that connect real-world experiences with math and science concepts and skills
www.TeachEngineering.org

Teacher's Domain: Biotechnology. A teacher resource on biotechnology
www.teachersdomain.org/special/biot/

USGS Education. Integrated projects and inquiry lessons in Earth science from the U.S. Geological Survey (USGS)
http://education.usgs.gov/

Social Studies

Buck Institute for Education. Resources and links for project-based learning and problem-based economics and government
www.bie.org/tools/

CountryReports. Resource for students doing reports with historical and current information on most countries
www.countryreports.com

CultureQuest. Inquiry-based classroom projects that explore other cultures
www.culturequest.us

iEARN. Collaborative education projects that both enhance learning and make a difference in the world
www.iearn.org/

Global SchoolNet: International CyberFair. Invitation to students around the world to create, submit, and share theme-based websites as classroom projects
www.globalschoolnet.org/gsh/cf/index.html

Library of Congress: Teaching with Primary Sources. An aide to teachers in using primary source materials from the Library of Congress
www.tpsnva.org/index.php

National Council for the Social Studies Teachers' Library. Lessons in a variety of courses, including document-based questions
http://www.socialstudies.org/teacherslibrary

Peace Corps. Peace Corps lesson plans and projects that promote cross-cultural understanding
www.peacecorps.gov/wws/educators/

Students of the World. School-based blogs from countries around the world; schools can post blogs here and interact with schools from other countries
www.studentsoftheworld.info/menu_schools.php3

World Savvy. Professional development services for teachers to help them easily incorporate international issues into classroom instruction
http://worldsavvy.org/

Peer Review

No matter what the format of a peer review, the objective is always the same — help teachers improve instruction. For every type of review, have a clearly defined process that outlines the roles and responsibilities of the reviewers and the teacher whose practice/work is being reviewed. Equally important is a set of criteria for the review. This guides the teacher's work and provides the reviewer with a focus for commenting on that work.

Peer Teaching Observation

Peer observation of teaching involves using one's peers to examine aspects of teaching and learning. It is an opportunity for staff to reflect on strengths and weaknesses and to work together for improvement. The overall goal is to establish a culture of self-study that stimulates continuous inquiry, reflection, information sharing, and improvement. Through a peer observation process, teachers can periodically examine and reflect on where they stand in relation to their goals for improving teaching and learning.

Education groups universally endorse the value of peer observations. Finding the time to do it is difficult, however. To make the peer observation truly valuable, the full process of conferencing is essential:

- discussions about teaching prior to delivery of instruction
- classroom observations
- discussions about teaching after delivery of instruction

Having a peer in the classroom to judge performance can initially be threatening to many teachers. Both reviewer and reviewee will be more comfortable if there is a well-defined focus. Therefore, perform peer observations around a specific purpose rather than judging overall instruction. For example, the observation might focus on the effective use of group learning or the integration of technology.

Teaching Behaviors Appropriate for Peer Teaching Observations

Specific purposes for data gathering during a peer observation include the following. Choose no more than two for the observation.

- looking for examples of real-world applications
- patterns of calling on students
- balance of negative and positive feedback
- clarity of directions
- using open-ended questions
- body language
- wait time for student response to teacher questions
- balance of teacher and student talk
- correlation of objectives and activities
- effective use of cooperative learning groups
- strategies for helping individual students
- recognizing different learning styles
- strategies for encouraging students who choose not to participate
- reducing interruptions
- "kid watching" to give feedback on the behavior of certain students
- collecting data for action research projects

Peer Learning Experience Reflection

Reflection on the peer learning experience does not happen while in the classroom but rather while reviewing teaching plans and learning experiences. Of particular importance is looking at students' work.

Often when educators think about lesson planning, the focus is on the directions to the teacher on how to prepare for instruction, including resource needs and procedures. While these are aspects of instruction that teachers can reflect on, the most important area for reflection is student work.

One of the best ways to measure the quality of instruction is to examine the work that students produce. Too often an observation of the quality of learning is inappropriately focused on the behavior of the teacher. While many teacher behaviors do correlate with high levels of student achievement, concentrating directly on the quality of the student work is far more productive. This is a better indication of how well students are learning.

A big part of teaching is looking at students' work. Teachers score, grade, and comment on classwork and homework. They may also use samples of student work as models or for diagnostic purposes. However, teachers typically look at their students' work on their own rather than with colleagues.

A powerful improvement process is to organize groups of teachers to look at student work thoughtfully together. Administrators and curriculum coordinators should join teachers in looking at student work. Groups can include teachers from several schools and even involve parents and community members. Be sure that student names are not on the work.

The work being done in schools can and should be public as long as personal privacy is protected. Schools tend to be isolated and isolating places. Looking at work collaboratively can break down this isolation.

Criteria for the Peer Review

Relation to learning standards: Is the learning experience linked to performance indicators for specific standards?

Rigor: Is the learning experience appropriately challenging in academic rigor, allowing students to think independently and extend their knowledge?

Real-world relevancy: Does the learning experience relate to a problem or situation that is connected to the world beyond school and allow students to focus on a real audience for a real purpose?

Student work: Is both the student work and how it will be assessed clearly defined?

Engagement: Does the learning experience appear likely to engage students?

Assessment: Are elements of good assessment incorporated into the experience?

Adaptability: Can the learning experience be replicated in other classrooms?

Integration of technology: Does technology, when used, assist students in completing the learning experience and achieving the learning standard?

Presentation: Is the learning experience developed so that other teachers can relate to it and easily adapt it to their own classrooms?

Format for Peer Review

Teacher Presentation of a Learning Experience

Introductions: The facilitator gives an overview of the peer review format, asks for a recorder, and distributes to each reviewer a reporting form that contains the criteria for review. (5 minutes)

Teacher Presentation: The teacher presenter outlines the learning experience, including information on the context in which the work was done, the targeted learning standard(s)/performance indicator(s), and samples of student work. The teacher may suggest a focus question for the review. (10 minutes)

Quiet Time: All reviewers read the learning experience, examine all related materials, and take notes on the reporting form. (10 minutes)

Reviewer Feedback: During this time, reviewers provide warm feedback (supportive and empathetic responses that emphasize the promise of the learning experience) and cool feedback (critical and comparative responses that emphasize the ways in which the learning experience may be enriched). The presenting teacher listens and takes notes. (10 minutes)

Teacher Response: The teacher responds to the peer reviewers' comments. Reviewers become the active listeners. (10 minutes)

Full Group Conversation: Both teacher and reviewers engage in open conversation about the learning experience. (10 minutes)

Summary: The recorder summarizes the session, reviews references made to the criteria, and offers a general overall impression. (5 minutes)

Consultation: The facilitator, recorder, and teacher presenter confer and complete a written report so that the teacher has immediate feedback of the learning experiences.

Peer Review Lesson Submission Form

Lesson Title _____ **Your Name** _____

Write up the lesson to be reviewed, addressing each of the following categories.

Learning Context

What is the purpose, objective, or focus of the learning experience, including the learning standards and the specific performance indicators being assessed?

Where does this experience fit in the school or course curriculum?

What do students need to know and/or be able to do to succeed with this learning experience?

Outline and Timetable

Outline the major aspects of the lesson.

For each aspect above, state the amount of time for preparation and implementation. Use the length of class period and the number of days to measure the implementation of the lesson.

Procedure

Describe, in narrative form, your actions and the actions of students, including how the learning experience:

- supports student progress toward attainment of the learning standards
- reflects current scholarship in your field and "best" classroom practice
- incorporates technology (when used)

Peer Review Lesson Submission Form (Continued)

Reflection

Why was this lesson developed?

What did you learn from implementing it?

How effective was it?

Resources

List unique resources (human or material) needed to complete this experience successfully, both for the student and for you.

Instructional/Environmental Modification

Describe the procedures used to accommodate the range of abilities in the classroom, including students with disabilities, students with limited English proficiency, or bilingual students.

Student Work

What products will students produce? Attach examples or photographs of student work reflecting different levels of student performance.

Assessment Plan

Describe the manner in which students are evaluated and reflect on their work. Submit any assessment tools used to document student progress (e.g., scoring guides, rating scales, or checklists).

Criteria for Lesson Review

I. RELATION TO LEARNING STANDARDS

This learning experience clearly links to performance indicators/topics/benchmarks for the specified learning standard(s). It requires students to understand and use ideas, perspectives, tools and/or methods that are central to the learning standards.

Comments:

- ❑ Excellent
- ❑ Good
- ❑ Fair
- ❑ Poor

II. RIGOROUS

The learning experience is appropriately challenging in academic rigor, allowing students to think independently and extend their knowledge.

Comments:

- ❑ Excellent
- ❑ Good
- ❑ Fair
- ❑ Poor

III. REAL-WORLD RELEVANCY

The learning experience relates to a problem or situation connected to the world beyond school and allows students to focus on a real audience for a real purpose.

Comments:

- ❑ Excellent
- ❑ Good
- ❑ Fair
- ❑ Poor

IV. STUDENT WORK

The student work is clearly identified, it relates to the learning standards, examples are presented, and it is clear how the work will be assessed.

Comments:

- ❑ Excellent
- ❑ Good
- ❑ Fair
- ❑ Poor

V. ENGAGEMENT

The learning experience allows students to become actively engaged in tasks that lead directly toward the learning objectives.

Comments:

- ❑ Excellent
- ❑ Good
- ❑ Fair
- ❑ Poor

continued

Criteria for Lesson Review, continued

VI. ASSESSMENT PLAN

The learning experience incorporates elements of good assessment: clear criteria to guide work, feedback on work in progress, and reflection on work completed.

Comments:

- ❑ Excellent
- ❑ Good
- ❑ Fair
- ❑ Poor

VII. ADAPTABILITY

The learning experience is adaptable to other classrooms and other students. It does not require a narrow student population, undue expenses, or extraordinary circumstances.

Comments:

- ❑ Excellent
- ❑ Good
- ❑ Fair
- ❑ Poor

VIII. TECHNOLOGY INTEGRATION

The technology, if used, assists students in achieving the learning standard addressed in the assessment plan.

Comments:

- ❑ Excellent
- ❑ Good
- ❑ Fair
- ❑ Poor

IX. PRESENTATION

The learning experience is clearly written and fully developed so other teachers have a real understanding of what is happening in the classroom and can relate to it.

Comments:

- ❑ Excellent
- ❑ Good
- ❑ Fair
- ❑ Poor

Action Research

Action research is a process for solving problems in which a teacher examines his or her own practice systematically. By using research techniques, the teacher collects data and makes objective observations on the implementation of a particular strategy to determine how well it is working. *Action* accurately describes this research because the teacher takes active steps to raise student achievement.

Action research is a useful improvement technique for working on problems teachers have identified for themselves. Teachers become more effective when they examine and assess their own work and then consider ways of doing things differently.

Action research is more extensive than simply thinking about one's teaching and how it can be improved. Action research is systematic and involves collecting evidence on which to base rigorous reflection. It is more than problem solving; it is problem posing.

For example, a teacher might use action research to evaluate two algebra classes. Perhaps the students in one class receive supplementary computer-based instruction, and the other class does not. Were there differences in achievement or in areas of strength and weakness? A teacher may also measure whether students working in groups or with greater choice in research topics prepare better reports than students working alone or on assigned topics.

Action research leads to the continuous improvement of instruction. Teachers look for innovations they can introduce and collect data systematically to determine whether one technique works better than another. Teachers should continually pose questions about their approaches and apply action research techniques to reflect on which innovations lead to the greatest improvement.

Collaborative action research involves teams of teachers inquiring about the teaching responsibilities that they share. This might involve the use of outside experts, such as university professors.

Action research can also be done schoolwide; the entire staff can undertake a problem and collect data to determine a course of action. Participants should be committed to the education practice being studied.

This can be difficult to accomplish which is why the individual teacher most frequently does action research. If a team or the entire staff engages in a research question, it should be a question that directly affects all of them.

Getting Started in Action Research

By continually asking questions about your own instruction and then collecting data, your role as a teacher easily extends to being a researcher as well. Action research begins with a question or a researchable topic generally related to whether a strategy improves learning. For example, if students have just started to use instructional technology in their independent research reports, you could collect data on whether

these reports are of better quality than those completed by students who did not have access to this technology.

Once the question is identified, decide how to collect the data.

- One source is test scores although test scores are often not available to measure the question being addressed.
- Written materials, such as interviews, observations, logs, journals, and other reports, provide data to use for comparison and reflection.
- Data might be in a visual form, such as videotape.

When collecting data through interviews or observations, try to have a specific set of questions to guide the data collection. By thinking through the questions in advance, the information you collect will be more precise.

Stages in Action Research

- Posing research questions around student learning
- Collecting research data systemically
- Taking action to make changes based upon data
- Evaluating results by collecting more data

Steps in Action Research

A Guide for Classroom Teachers (Fairfax County, Virginia, Public Schools, Office of Research and Policy Analysis)

1. Develop research questions based on your own curiosity about teaching and learning in your classroom.
2. Systematically collect data from and with your students.
3. Share and discuss your data and research methodology with fellow teacher researchers.
4. Analyze and interpret your data with the support of your colleagues.
5. Write about your research.
6. Share your findings with students, colleagues, and members of the education community.
7. Discuss with colleagues the relationships among practice, theory, and research.
8. Assume responsibility for your own professional growth.

Benefits of Action Research

Benefits of action research include the following:

- Increased thinking about instructional issues and student learning
- Improved student performance

- Revision of practice that is based on new knowledge about teaching and learning
- Increased teacher motivation
- Teacher-designed and initiated staff development

Action research is not just about hypothesis testing or about interpreting data to arrive at conclusions. It is concerned with changing situations. A researcher makes passive observations. The teacher as researcher may make observations, but he or she is also interested in making changes based on those observations.

Personal Improvement Plans

Professional development is best promoted by giving teachers the opportunity to collaborate at the school level. Studies have shown that while most teachers work alone, they desire more collaboration with their peers. Research has also shown that schools are more effective when teachers have opportunities to observe their peers, help one another, and participate in school improvement plans. Teachers are more likely to make changes in their teaching if they see their peers attempting similar changes and have opportunities to discuss ideas, challenges, and implementation.

Just as students learn better when they are able to construct knowledge by linking new experiences to previous ones, teachers need to learn through discovery and constructing knowledge.

Professional development should involve a balance of training, content learning, and collegial support. There are times when training in a new technique or technology is essential. However, professional development designed as training has limited transfer and implementation possibilities.

The subject matter approach may be appropriate for initial teacher preparation; however, it is difficult to convince practicing teachers that they need more content knowledge. While teachers often need to learn additional content, professional development must emphasize an ongoing structure of collegial support if any change is to occur.

The most valuable professional development and the greatest source of new ideas come from activities designed and controlled by teachers as individuals. The process for achieving improvement is for teachers to develop their own personal improvement plans.

What Teachers Think Is Most Effective

In a National Education Association study, teachers ranked 14 sources of professional development with respect to providing the knowledge and skills needed in teaching situations. These sources, ranked in order from most effective to least effective, were as follows:

1. Direct experiences as teachers
2. Consultation with other teachers
3. Study and research pursued on one's own
4. Observation of other teachers
5. Graduate courses in field of specialization
6. Consultation with specialists
7. Undergraduate courses
8. Professional conferences/workshops
9. Professional journals
10. Graduate courses in education
11. Formal evaluation of teaching performance
12. Consultations with building level administrators
13. Undergraduate education courses
14. In-service training provided by school district

Models of Individual Professional Development

As you develop your personal improvement plan, consider these models of providing professional development adapted from Loucks-Horsley, et al., *Designing Professional Development for Teachers of Science and Mathematics*.

Distance Learning

In distance learning, the information comes electronically to the teacher. Content can be divided into more manageable pieces and offered through more sessions over longer periods of time. The advantage of receiving information in smaller chunks should be weighed against the lack of personal interaction in distance learning.

Self-Study/Resource Centers

Some people learn best on their own. Teachers can accomplish excellent professional development through regular access to periodicals, training materials, videotapes, computer study guides, and DVDs. Having these materials in a resource room at school is convenient; however, maintaining currency of the resource room can be a challenge.

Study Groups/Teams

Some of the most valuable learning comes from regular conversations among small groups of teachers focused around a single topic. These teams can meet regularly to discuss a particular problem or initiative. Frequently, combining self-study or reading with a study group creates a powerful learning situation.

Play/Experimentation

Young children do most of their learning through play and experimentation, and adults still need a place for this type of learning. You can learn by observing the environment around you, trying things out, replicating things that work, continuing to collect new ideas. Computer skills are an excellent example of new skills that can be learned through play. Features of computer software can be learned merely by exploring and experimenting. This form of learning can be frustrating but also truly empowers the individual.

Teacher Research

Do not underestimate the power of learning through action research. Structure action research in the classroom. Set up experimental designs and collect evidence of the differences that result. By directly measuring the impact of changes in instructional practice, you can acquire an appreciation for the changes. Researching your own practice can yield significant change in the classroom.

Partnerships

Staff development can be provided by an outside organization for a specific purpose. One common example is partnering with a computer software vendor to provide training and ongoing support as teachers acquire new skills. Partnering with a social service or law enforcement agency can result in new professional networks that provide new ideas and further expand teachers' knowledge.

Immersion

Immersion involves creating situations outside of the classroom that engage you in an activity to develop a new perspective and acquire new skills. For example, a summer internship in a business can help you acquire technical skills related to your subject area responsibility. Immersion can also be an effective technique for learning computer skills.

Coaching/Mentoring

One way to develop new skills and knowledge is to challenge yourself to take on new responsibilities, such as team teaching or doing peer evaluations. Working in pairs or small groups can result in dynamic learning.

Become a lead teacher, a member of a curriculum team, or a trainer. People are more inclined to embrace a new idea when it comes from a respected peer rather than from a stranger.

Coaching and mentoring provide ongoing feedback and support. Coaches and formal mentors guide, help, and encourage. They provide information on pedagogy and content, help teachers adapt new practices to their unique contextual conditions and analyze the effects of their efforts, and encourage teachers to continue despite minor setbacks. In other words, coaching or mentoring is personal, practical, on-the-job assistance.

Personal Growth Plan

The following reflective questions will guide you through the key aspects of developing a professional development plan.

Student Achievement

Goals: What will students achieve differently as a result of your professional development?

Documentation: What sources of data will you use to measure student achievement goals?

- ☐ Student Performance Test
- ☐ Student Portfolio
- ☐ State Test
- ☐ Local Test
- ☐ AP Test
- ☐ Student Projects
- ☐ Student Interview
- ☐ Job/College Placement
- ☐ Other _____

Personal Needs Assessment

Source: What sources of information will you use to identify needs to be addressed in this plan?

- ☐ Personal Observation
- ☐ Student Performance
- ☐ Student Achievement Data
- ☐ Student Feedback
- ☐ Administrator Observation
- ☐ Peer Observation
- ☐ Self-reflection
- ☐ New Responsibility
- ☐ Other _____

Type: What type of knowledge or skill will this plan focus on?

- ☐ Classroom Management
- ☐ Content Knowledge
- ☐ Instructional Strategies
- ☐ Development of Assessments
- ☐ More Rigor/Relevance
- ☐ Use of Technology
- ☐ School Safety
- ☐ Analyzing Student Data
- ☐ Standards
- ☐ Character Education
- ☐ School to Career
- ☐ Other _____

Description: What aspects of teaching and learning do you wish to improve?

Professional Development Goals

Goals: What are your goals for professional development? Be specific. Include a timeline.

Personal Growth Plan (Continued)

Professional Development Activities

Methods: Which methods will you use to achieve professional development?

- ☐ Workshop
- ☐ University Course
- ☐ Distance Learning
- ☐ Self-Study
- ☐ Study Group
- ☐ Experimentation
- ☐ Action Research
- ☐ Partnership
- ☐ Immersion
- ☐ Coaching/Mentoring
- ☐ Other _____

Activities: What professional development activities will you complete? Include a timeline.

Professional Development Reflection
To Be Completed After Professional Development

Activities

What did you personally accomplish in your professional development?

Evaluation

What are the positive impacts of this professional development?

What would you do differently?

Follow Up

What changes will you make in instruction?

What are the expected changes in student learning?