Content Area Literacy Guide

August 2007

The content for this component of CCSSO's Adolescent Literacy Toolkit was provided by Public Consulting Group's Center for Resource Management, in partnership with the Council of Chief State School Officers (August 2007). The content was informed by feedback from CCSSO partners and state education officials who participate in CCSSO's Secondary School Redesign Project.

Table of Contents

Content Area Literacy Guide

PURPOSE

It is indisputable that high school students must become proficient readers and writers to successfully meet the requirements of the secondary curricula and be adequately prepared for college and citizenship. But all too often high school teachers have not been adequately prepared to strengthen the literacy skills of their students. This Content Area Literacy Guide[1] is a resource to help high school teachers learn how to use literacy strategies as an essential means to help students master core content.

OVERVIEW

The Content Area Literacy Guide begins with a description of the various terms that are used within its pages, followed by an explanation of why content literacy development is critical for all students at the high school level. The Guide provides concrete suggestions for supporting all students as they progress from the *learning to read* focus of elementary school to the *reading to learn* focus of high school core content classes.

Examples of instructional strategies and best practices that support adolescent learners to improve content literacy and learning outcomes within the science, social studies, mathematics, and English classes are provided to encourage thinking and discussion by secondary educators as they learn more about literacy best practices. Suggestions are provided about how to integrate what is known about adolescent literacy and literacy best practices into content instruction.

The Guide also includes a framework for effective lesson planning and a template to assist with planning content area lessons that incorporate before, during, and after reading. Teachers may adapt the template to address district and local school lesson planning requirements.

The Guide concludes with a collection of nearly two dozen strategies that support students' literacy development and their understanding of content. Each strategy includes a description, its purpose, step-by-step directions for use, and suggestions for differentiated applications. Each description also contains a quadrant chart that illustrates how each instructional strategy might be implemented in an English, mathematics, science, or social studies classroom.

[1] The focus of this Guide is on content area reading, but two points must be emphasized: 1) Although reading is emphasized in these materials, literacy is more than just reading; 2) Many in the literacy field stress the interconnectedness of reading, writing, and thinking and the need to explicitly provide instruction and modeling for each of these to support student success.

PART I: UNDERSTANDING CONTENT LITERACY

A Common Language for Literacy and Learning

It is important to have common language when talking with colleagues and with students about literacy and learning. Without a shared vocabulary, it is difficult to talk about what you are trying to accomplish to improve teaching and learning.

In this Guide, *adolescent literacy* refers to the ability of middle and high school students to competently read, write, think about, discuss, and present text-based information and ideas using a wide variety of print formats, including electronic and multimedia.

Three additional terms appear frequently throughout these materials: *learning strategies, instructional strategies*, and *best practices*. It is important to note these concepts have many meanings throughout the field of literacy. Thus, the definitions below are not intended to define these terms in the field, but are used here to help teachers understand and use the resources in this Guide.

Learning Strategies

Learning strategies refer to the specific *strategies* students learn how to use independently to understand a new concept or master a skill. One way to think about learning strategies is to consider what an effective practitioner of a discipline does to solve a challenging problem. For example, what do good readers do when confronted with the challenge of understanding a difficult text? Good readers consider what they know about a topic before reading. They also monitor their comprehension and generate questions as they read.

In order for students to learn how to use specific learning strategies independently, it is important for teachers to explain and ensure students understand the following:

1. What each strategy is designed to do
2. Why the strategy is important to use
3. How the strategy works

Instructional (Literacy Support) Strategies

Instructional strategies are the specific *techniques* teachers use to support student learning. They are often used to convey and organize information that is provided to students, or they may be used to teach specific learning strategies. In the field of content literacy, *instructional strategies* are often referred to as *literacy support* strategies, e.g., two-column note taking (which supports the *learning strategy* of note taking), anticipation/reaction guide (which supports the *learning strategies* of establishing a purpose for reading and finding evidence in the text), reciprocal teaching (which supports the social nature of literacy and the specific reading comprehension strategies of predicting, summarizing, clarifying, and questioning), as well as others.

It is important to note that a teaching strategy may also be a learning strategy. For example, a teacher may ask students to use a graphic organizer to organize information from a text. Students may also use graphic organizers independently to support their reading of texts.

Best Practices

When using the resources in this Guide, *best practices* refer to routine uses of instructional strategies that support student learning. Best practices develop from evidence in the research, as well as the interpretation of the evidence by experts in the field. Since research is always ongoing, what constitutes a best practice is always evolving and open for debate.

One best practice promoted in this Guide is the *Before, During, and After* framework. This framework describes the routine of using instructional strategies at each of the following three phases of instruction:

1. Prior to reading a text to prepare for learning
2. During the reading of a text to monitor comprehension
3. After the reading of a text to consolidate learning

Another best practice is the *Gradual Release* model. This is a pattern where teachers provide a great deal of scaffolding or support when students are introduced to new material. As a lesson or unit progresses, scaffolding is gradually released until students have independently mastered the concepts or skills. The gradual release model often includes the following:

1. Direct instruction and/or modeling at the outset
2. Some type of collaborative or small group work
3. Independent practice or demonstration

Concluding Remarks

When supporting students' literacy development in any content area, it is important to:

1. Consider what learning strategies students need to use in order to master the concepts and skills being taught
2. Determine what instructional strategies best fit the context
3. Make sure effective instructional routines are practiced on a regular basis

Making the Case for Adolescent Literacy Instruction

What the Data Show

If we hope to increase students' content knowledge, persistence through graduation, and readiness for college and citizenship, *literacy instruction must be an essential component of all core content classes***.** The reality is many middle and high schools do not provide this instruction systemically across all content area classes. The result is many students who enter high school on or close to grade level reading skills are losing ground as they progress through high school. A recent study of high school juniors and seniors taking the ACT College Exam found that only half of the students were ready for college-level reading assignments in core subjects like mathematics, history, science, and English (ACT, 2006).

An additional reality is most students are not arriving at our nation's high schools with grade level reading skills. Less than a third of the nation's adolescents demonstrate proficiency with grade level reading skills and expectations; even worse, only one in seven low-income students are meeting grade level expectations (National Center of Education Statistics, 2005). Governor Wise of the Alliance for Excellent Education puts it this way, "reading is the heart of learning, and the nation is in the literacy emergency room showing a flat line on the education EKG. The National Assessment of Educational Progress (NAEP) results, nationally and for each state, clearly demonstrate we still are not doing what is needed to help our older students build the reading skills they will need to deal with increasingly complex high school courses" (AEE, 2006).

Elementary Versus High School Literacy Instruction

In the elementary years, reading instruction focuses on *basic reading:* phonics/decoding, fluency, and comprehension of narrative and simple informational text. The type of instruction needed for most students to be successful with content area reading and writing changes drastically in middle and high school. Students in middle and high schools are bombarded with a wide variety of complex expository and descriptive text, technical content vocabulary, and writing requirements of content classes. Most students know how to read on at least a literal level when they enter high school. In other words, they can decode and comprehend basic information when reading straightforward text. However, many do not know how to "read to learn" more complex texts on their own; they do not know how to independently use reading, writing, and critical thinking strategies to comprehend information, construct meaning, question the author's thinking against other text or their own experiences, or synthesize new information and ideas to new situations. Literacy instruction at the high school level should support students to continue developing reading fluency; improving vocabulary knowledge; developing higher-level reasoning and thinking skills; improving reading comprehension strategies, and increasing student motivation and engagement with reading and writing (Torgeson et al., 2007).

Literacy Instruction in the Content Areas

Content literacy instruction is needed for students to meet the reading, vocabulary, critical thinking, and writing demands they face. With just basic reading instruction, students are unprepared to read, write, and discuss using the language of science, social studies, mathematics, and English language arts—the result is that many are not successful without support to do this within the context of content area instruction. As students are asked to read texts of increasing complexity from grade level to grade level, their skills as readers must also become increasingly sophisticated. High school students still need support in learning how to comprehend and critically think about media, lectures, demonstrations, charts and graphs, and hands-on activities. When they are confronted each year with increasingly complex texts to read in every class, in content areas that are either new to them or require higher order analysis, evaluation, and synthesis, many students find that they "can read it, but don't get it" (Tovani, 2000). Students need to realize that the skills, comprehension requirements, and understanding of text structures involved with reading a mathematics textbook, a science journal article, a primary source in a history class, and a Shakespearian play are quite different—and they need to be able to use effective learning strategies with each.

Content area teachers play a critical role in supporting adolescents' ability to comprehend the tough expository and literary text they are required to read. There are two main reasons for this:

1) No one understands the specific content of English language arts, social studies, science, and mathematics better than the teacher of that discipline. Content area teachers are the ones who have the knowledge of the reading, writing, listening, discussion, and deep thinking skills that are required to understand content text.
2) Content area teachers have the opportunity to develop students' literacy skills because they see them on a frequent, regular basis and can teach content relevant to reading and writing within the context of a unit of study, promoting engagement and learning (Irvin, J., Meltzer, J., & Dukes, M., 2007).

Content area teachers need onsite support to learn and implement literacy best practices through professional development and opportunities to collaboratively plan and share literacy instructional strategies. When teachers receive this type of support, they can play an essential role in addressing and supporting the literacy needs of adolescents. The suggestions within this Guide provide a framework for content teachers to use to begin to address the alarming statistics of adolescent literacy within their classrooms.

What Content Area Teachers Need to Know

Teachers often find they actually know more than they realize about good reading practices because many are avid readers in their content area and intuitively construct meaning. Many teachers intuitively know how to read their content, but may not have used a specific instructional strategy to help students learn these skills. Teachers need to make the steps in the reading/learning process visible and accessible to every student.

First, it is important that teachers understand and articulate the specific reading and learning demands of their respective content areas. Because some state standards embed literacy standards within content descriptions, or separate them into reading or English language arts standards, many teachers of mathematics, science, and social studies have not directly considered the cognitive demands of content learning. As a result, they may assign reading, writing, and thinking tasks without considering whether or not the students have the requisite literacy skills to complete the task.

Next, it is essential for teachers to learn and use a repertoire of instructional strategies, presented later in this Guide, in purposeful ways to support students to be able to transfer their use of these strategies across a department, team, and/or school. Within a department or learning team, teachers can agree on the types of reading, writing, research/inquiry, and speaking/presenting opportunities students will have, where instruction on how to do these will occur, and which instructional strategies will be taught, modeled, and used. This will support students in developing fluency with learning strategies they can use to accomplish content area learning tasks. Transfer of learning strategies across content areas occurs when students experience common instructional strategies across content areas and classes.

There are instructional strategies that work well across all content areas, but there are also studies indicating that some specific literacy strategies support reading and writing in certain content areas. In particular, reading and writing in science (Norris & Phillips, 1994), social studies (Mosburg, 2002; Perfetti, Britt, & Georgi, 1995), and mathematics (Leong & Jerred, 2001) require specific skills unique to each content area (as cited in Torgeson et al., 2007, p 18).

The following descriptions provide readers with some background information about the reading and writing demands of the four core content disciplines and important literacy tasks in each area. If the reading/writing connection is fully developed, students will be better prepared to make meaning of expository and narrative text. Content teachers have the opportunities to not only teach the skills and learning strategies most applicable to their content, but they also can model and teach students how to use reading and writing to learn the content material. The following information can serve as a springboard for powerful discussions among teachers, teams, departments, and schools as they consider how to connect instructional goals with instructional strategies in core content classes. For further information about content area reading and writing, visit the **Content Expert** section of the CCSSO Adolescent Literacy Toolkit.

Reading and Writing in Science

Science text often presents students with particular roadblocks to learning because the vocabulary is technical, the text is filled with symbols and formulas. and it is often written in an expository style. Science textbooks are often written on a much higher reading level than the students' actual reading level or grade level. This presents a challenge for both the on-grade level student, but especially for the struggling reader. Explicit teaching and modeling of comprehension strategies, vocabulary development activities, use of leveled text, and use of collaborative group protocols for reading text and text supplements are just a few of the instructional strategies and practices that will support literacy needs of science students.

Lab experiences provide science students with a good opportunity to learn and remember some of the abstract vocabulary found in science text (Barton, 1997). For instance, it is much easier for students to understand the term *mitosis* if they can view slides of the stages of cell division. Lab experiences also provide an opportunity for students to make the reading/writing connection through the recording of observations, predictions, and developing hypotheses. The key is to help students make these connections on their own, as many depend on teachers to frontload information and guide them in explaining lab processes and results.

Inquiry-based science encourages students to use higher order thinking skills and conduct investigations. Students need support with selecting tools, such as graphic organizers or learning logs, to collect information from text or experiments as they search for answers. Organizing their findings and thoughts through writing helps students summarize, synthesize, and reflect on what they have read or discovered during their investigative methods.

Science tasks require students to gather data, make predictions, conduct experiments, and interpret data. This requires students to draw upon critical reading skills such as following directions, drawing conclusions, and problem solving. Understanding these literacy and cognitive skill requirements of science will allow teachers to help students select appropriate instructional literacy strategies to support learning and understanding.

Sample literacy tasks required of science students:

- Compare and contrast
- Form hypotheses and draw conclusions
- Understand the 'bigger picture'
- Determine the relative importance of information
- Write about findings in learning logs or as part of lab report conclusions

Reading and Writing in Social Studies

Students' success with social studies text requires them to have not only basic level skills such as the ability to recall and select main ideas and details, but also the ability to use higher order thinking skills to analyze text format and structure, evaluate perspective and sources, and synthesize across multiple texts. As students engage with text, they use questioning strategies or skills to build meaning and understanding (Beck & McKeown, 2002). They also must identify cause and effect relationships, recognize bias, distinguish fact from opinion, and compare and contrast. Social studies texts come with other literacy challenges—the need to read graphs and maps and various presentations of data.

As social studies teachers plan instruction, it is important to identify instructional strategies that will best support students to learn facts and, more importantly, to understand context and relationships and to make connections from differing periods of history to current events. Questioning strategies, such as Question Answer Relationship (QAR) and ReQuest, move students from simple recall to making the types of inferences that are so important for students' deep understanding of social studies text.

Class activities should support the reading/writing connection and help students move from a basic understanding of bias, issues of equality and differing points of view. Instructional strategies should transition from reading about cause and effect relationships to writing persuasive and argumentative essays supported by students' understanding of the topic. By writing about the information collected during reading of social studies texts, students have the opportunity to clearly define their thinking and understanding. Writing assignments in social studies should stimulate students' thinking and may include report writing about an event in history; expository writing to compare and contrast; writing narratives that weave historical events with fiction; and writing to argue or defend an idea or belief.

Sample literacy tasks required of social studies students:

- Sequence and make connections between historical events
- Understand text structures and features
- Evaluate sources
- Recognize issues and trends in context

- Engage in reflective inquiry through reading and writing
- Recognize and write about cause-and-effect relationships
- Distinguish between, and write about, fact versus opinion

Reading and Writing in Mathematics

Mathematics texts are dense with symbols, equations, concise explanations, and graphic representations that require students to read slowly and deliberately. Understanding the technical vocabulary of mathematics is critical to knowing how to set up a problem or an equation. Students must also understand the multiple meanings of words such as *power, root, tangent, reciprocal,* and *degree,* which have specific meanings in mathematics that are quite different from their meanings in other contexts. Vocabulary development strategies, such as Knowledge Rating Guides and Triple-Entry Vocabulary Journals, can support the learning and remembering of mathematics vocabulary.

Understanding the language or vocabulary of mathematics is only the beginning of the literacy skills required to be successful with reading and understanding mathematics text. Other literacy challenges include understanding how the position of symbols in an equation or words in a word problem can influence meaning, how to read and interpret graphs, and how to write an explanation of one's mathematical thinking, or problem-solving steps.

Mathematics requires students to be analytical readers, something that does not come naturally to most students (MacGregor, 1990). The savvy mathematics teacher will use a variety of instructional strategies to help students read and understand mathematics text. Direct, explicit instruction will guide students' understanding of terminology; how to "read" mathematics expressions; and how to successfully identify words in a word problem to guide setting up the equation to solve the problem.

Constructing meaning through discussion and writing is the natural next step to comprehension. Mathematics students need the opportunity to discuss and investigate solutions and apply mathematical vocabulary in their writing and their thinking. When students have an opportunity to write about their thinking through the problem-solving process, they become much better at constructing meaning and understanding of the mathematics concepts and not just the mathematics operation.

Sample literacy tasks for mathematics students:

- Understand processes
- Grasp abstract concepts and translate them into symbols
- Distinguish patterns
- Decode words and numeric and nonnumeric symbols
- Translate words into problems and problems into words
- Use journals to write about and examine ideas and reflect on solutions
- Write paragraphs to compare key concepts, such as a line and a plane

Reading and Writing in English Language Arts

English teachers are often misidentified as the 'reading teachers.' The reality is the content of English language arts is literature, grammar, and certain forms of academic writing (e.g., essay, short story, critique). Typically, the focus is on teaching students the literary devices of fiction and nonfiction genres such as *characterization, plot, setting, figurative language, symbolism,* and *theme*. Yet, English teachers also have the responsibility to teach *how* to read, productively discuss, and write about literary works, not just to assign the reading or to teach the content of the reading. Because English language arts depend so heavily on being able to read and comprehend complex literary text, it is critical that English teachers know and teach their students specific learning strategies to help them learn how to construct meaning; analyze devices like characterization, theme, and plot; develop new vocabulary; and make inferences.

The English teacher also has a prime opportunity to encourage a love of reading by providing choice and a wide variety of reading materials (Wright, 1998). Too often, teachers are focused on assigning literature from required reading lists instead of motivating students to read. Student interests should guide the selection of reading materials, and how to select reading material or books should be an important support provided to students. Students need a print-rich environment with high-interest adolescent literature and selections that cater to a wide range of reading levels and connect with the cultural backgrounds and interests of students. The research of Wilhelm and others also strongly supports the need to provide an array of nonfiction materials within the English classroom. Nonfiction genres applicable to the English classroom include biography and autobiography, journalistic writing formats including newspaper articles, and factual accounts students can compare and contrast with fictional representation of similar content.

Although some teachers see read-alouds as a strategy only for younger students, secondary English teachers can connect easily with all students when they read aloud. Students enjoy hearing the voice of a fluent, expressive reader and will often be more eager to continue reading on their own if the teacher has used a read-aloud as a way to generate interest. Short book talks, quick verbal overviews of the books displayed in the classroom, and student sharing of their favorites through creative venues, like improvised TV interviews, can also inspire students to read for pleasure as well as learning.

Students need the opportunity to deeply discuss and write about good literature. Collaborative group exploration of a piece of literature provides an opportunity for student engagement while they discuss, construct meaning, and take ownership for their understanding of the text. Literature circles, reciprocal teaching, and other collaborative group strategies support cooperation, inquiry, problem solving, and communication skills that are so important for adolescents. At the same time, these instructional strategies develop students' abilities to effectively use the literacy and learning strategies of reading, writing, discussing, listening, and investigating to learn new content. Exposure to an array of fiction and nonfiction genres is also essential, and students benefit when they learn specific techniques for constructing meaning and critically responding to ideas and concepts for the various types of genre through writing and discussion.

Sample literacy tasks for English language arts students:

- Articulate thinking orally and in writing for various audiences
- Understand mechanical standards and rhetorical techniques
- Employ context clues
- Recognize literacy devices
- Understand how to read different literary genres
- Develop fluency with the use of the writing process to generate different types of writing
- Encourage the reading/writing connection to persuade, learn, inform, and evoke feelings

Strategic Teaching

The second part of this Guide details numerous instructional strategies that will help students develop literacy skills and better understand content. However, the strategies will not have much of an impact unless teachers use them deliberately as part of a routine of best practice. *Strategic Teaching* effectively combines teacher behaviors and instructional practices to support student learning and understanding of concepts and texts.

The strategic teaching model is effective because*:*

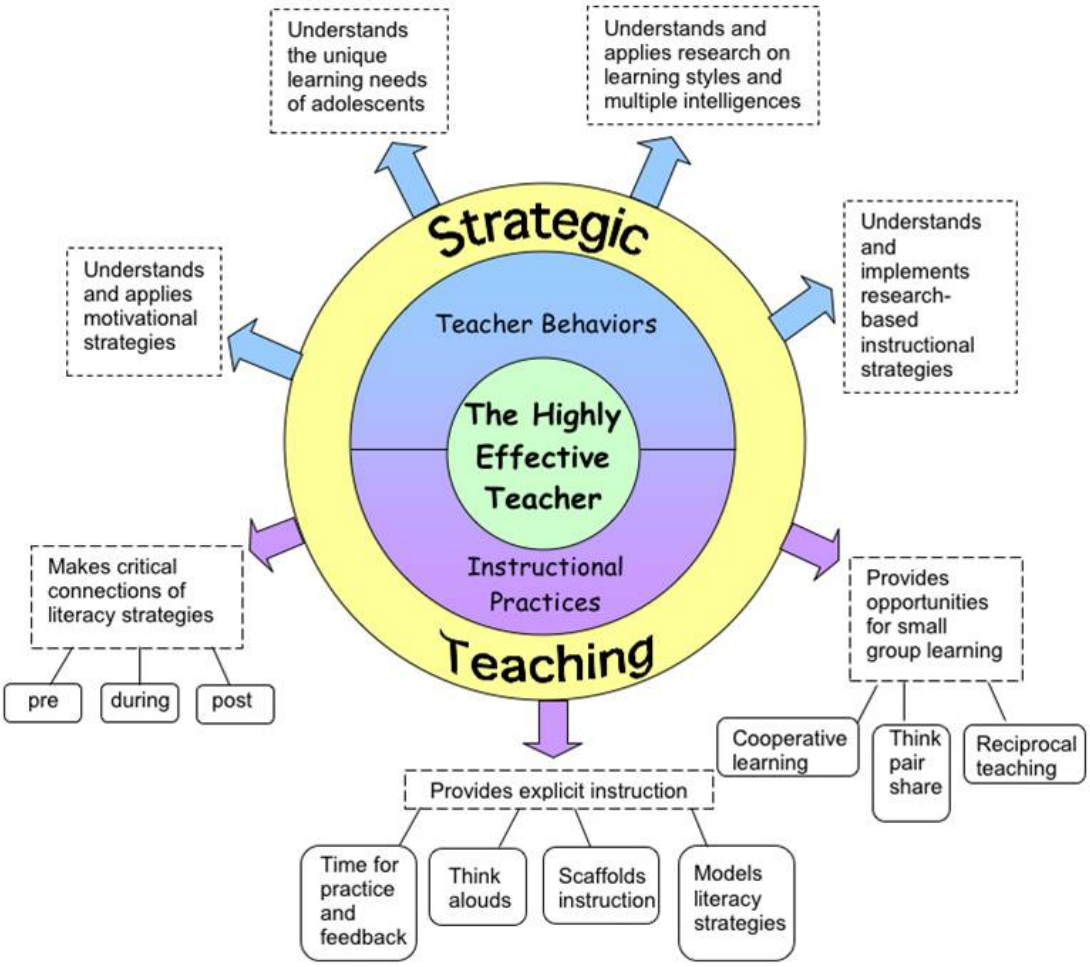
1) Students need time to practice learning strategies to support reading and understanding of text. Strategic teachers model strategies and scaffold instruction to support students as they internalize those strategies. The simple formula for scaffolding instruction is '*I do, We do, You do'* (Rosenshine, Meister, & Chapman, 1996).
2) Adolescents are social beings, and reading and learning are social behaviors. Interactive collaborative protocols, such as reciprocal teaching, think-pair-share, and other small group strategies, encourage student talk and deep discussions connected with learning content material. Collaborative grouping strategies provide opportunities for students to deeply discuss concepts presented in the text and to interact with one another at a level that assures comprehension and understanding. (Rosenshine & Meister, 1994; National Reading Panel, 2002; Applebee, A. N., Langer, J. A., Nystrand, M., & Gamoran, A., 2003; Guthrie et al., 2004).
3) Students need frequent opportunities to make connections with text. Using linked strategies to support reading, writing, thinking, and deep discussion about the text is a critical instructional practice that leads to student understanding. Strategic teachers routinely employ instructional strategies that help students make connections with the text before, during, and after reading and learning as an integral part of content area instruction. The instructional strategies a teacher chooses will depend on the purpose of the lesson, the nature of the material being studied, and student data. The National Reading Panel (2002) strongly recommends including instructional strategies to support students with "monitoring comprehension; using graphic organizers, generating questions, answering questions; using text structure; summarizing, activating prior knowledge, developing vocabulary, listening, and visualizing."

The strategic teaching model (Fig. 1) synthesizes the work of adolescent literacy researchers and practitioners. Although a simple model, the concepts and ideas portrayed in the graphic are complex and should serve as a reminder, when lessons are planned, to include those instructional strategies that best connect students with learning strategies. The result will be students who better comprehend textual

concepts and information. A reference list is provided at the end of this Guide to serve as a resource for further reading and powerful discussions among educators.

The graphic below illustrates the *Strategic Teaching Model* and is taken from *Creating a Culture of Literacy: A Guide for Middle and High School Principals*, p. 46. (2005). Reston, VA: National Association of Secondary Principals.

Figure 1



Best Practices Frameworks

In addition to strategic teaching, effective teachers support students with instructional strategies used within a best practices framework that connects literacy support with the instructional goals and the types of texts being read.

<u>Before, During, and After</u>

A best practice framework that fits most lessons or units is the *before*, *during*, and *after* reading framework. Use of this framework assists students at varying reading levels in making the important

connections proficient readers use when reading for meaning. Instructional strategies for each stage (before, during, after) of the reading/learning process are discussed below. The content teacher already supports most of these learning proficiencies with content-specific learning activities and pedagogy. Adding specific learning strategies enhances general instructional strategies by providing specific "how-to" support. Such procedures, templates, or approaches show the students how to achieve content objectives, instead of attempting to complete an assignment without a plan in mind.

Planning strategic lessons has similarities across all content areas. Although the literacy tasks and intensity of use by the specific content area may differ, the following descriptions for planning content lessons can be easily adapted to fit the needs of specific content areas. It takes time for teachers to learn how to effectively incorporate the literacy support strategies at the end of this Guide into daily classroom practice. The best model for becoming proficient with planning strategic lessons is when teachers work collaboratively within or across content areas to support one another to implement strategic teaching.

The following charts are adapted from the Alabama Reading Initiative-Project for Adolescent Literacy training guide, *Planning Strategic Lessons: A Step by Step Guide* (ALSDE, 2007).

1) ***Before* reading/learning instructional strategies to guide content learning**
   Preparing learners to be ready for content learning involves a variety of actions:
   - *Activating prior knowledge* by considering what is already known about a content topic and linking new information to it in the brain.
   - *Setting purpose* and *generating questions* for learning, such as to gain information; read for pleasure; learn a step-by-step process; or understand the historical relevance.
   - *Previewing* to ascertain how text features, graphs and charts, appendices, and other text structures can contribute to the reader's understanding.
   - Making *predictions* about what might happen; adjusting these predictions as new information is presented, and discarding them when faced with contradictory information.

Before Reading	
Teacher Instructional Practices	**Sample Activities for Students**
Teachers must: • Help students activate their background knowledge. • Help students establish purposes for reading. • Encourage students to generate questions. • Ask students to make predictions about text. • Help students construct graphic organizers. • Connect reading and writing.	Students will: • Brainstorm concepts, key words, and ideas. • Establish reading goals based upon purpose for reading. • Turn headings into questions. • Predict and verify based on scan or preview of content. • Construct a graphic organizer based on text structure to use during reading. • Write in a journal, vocabulary notebook, or other forms to connect with the text to be read.

Source: Fuentes 1998, p. 83.

2) ***During* reading/learning literacy instructional strategies to guide content learning**
   Helping learners comprehend content information and construct concepts and relationships involves a variety of actions:
   - *Questioning* to clarify and deepen understanding.

- *Monitoring* understanding and using fix-up strategies when they do not understand, such as rereading, reading on, or examining a word more closely.
- *Making connections* when they use information from personal experiences, other texts, and knowledge of world issues to make sense of text.
- *Inferring* by using prior knowledge to get a deeper understanding of text and making valuable connections with the author's intent when the answer may not be explicitly stated.
- *Drawing conclusions* and refining them as needed in light of additional information.
- *Summarizing* what they have read by stopping and reflecting during and after reading.
- *Creating mental images* or *visualizing* by "seeing" people, events, and relationships between concepts, but also using other senses (hearing, tasting, smelling, feeling) as they experience the meanings they build from text.
- *Analyzing* story structure and informational text structures and using these structures as supports for building meaning.
- *Synthesizing* by combining ideas and information within and across texts.

During Reading	
Teacher Instructional Practices	**Activities for Students**
Teachers must: • Model metacognitive and cognitive processes. • Verify and/or formulate predictions. • Help students integrate new data with prior knowledge. • Get students to think about what they are reading. • Help students construct graphic organizers. • Summarize text. • Read aloud. • Think aloud.	Students will: • Find answers to self-initiated questions. • Read silently. • Read with a partner. • Predict and verify. • Re-read if necessary. • Take notes. • Construct and use graphic organizers.

Source: Fuentes 1998, 83.

3) ***After* reading/learning instructional strategies to guide content learning**

Helping learners reflect about the content involves a variety of actions:

- *Reflecting* about what was read on personal, emotional, and cognitive levels.
- *Reviewing* information, ideas, relationships, and applications to real life by re-reading, summarizing, and deep discussion with others.
- *Presenting* understanding of concepts learned through the informal and formal written and spoken word, including small group classroom venues and authentic audiences.

After Reading	
Teacher Instructional Practices	**Sample Activities for Students**
Teachers must: • Encourage students to reflect on what they read. • Prompt students to evaluate predictions. • Examine questions that guided reading. • Require students to respond to text through discussion. • Require students to respond to text through writing. • Encourage retelling or summarizing. • Connect writing to reading.	Students will: • Discuss. • Debate. • Respond to questions. • Verify predictions. • Construct a graphic organizer. • Write in a journal. • Retell. • Summarize. • Role play. • Research. • Read related materials.

Source: Fuentes 1998, 83.

Gradual Release Framework

A second best practice framework for content area literacy is the *gradual release model (I do, We do, You do).* That is, teachers need to explicitly teach and model a literacy support strategy. It is important when introducing a learning strategy that teachers explain what the strategy is supposed to help students do (e.g., learning to effectively set a purpose for reading, learning to make inferences, learning to summarize). Then students need opportunities to practice the strategy in pairs or small groups and have time to examine how the strategy was useful and what it supported. They should also be given the opportunity to ask questions and to get feedback on the quality of their work. Only then should students be asked to implement a literacy strategy independently.

It is important to note that the gradual release process does not always occur within one lesson. The teacher may need to model the process several times before the students actually take ownership of the literacy strategy. Becoming proficient and selecting the strategy as a support for reading content material may take longer for some students than others. The teacher's continued support through explicit modeling and differentiation is key for students at all levels.

Planning Strategic Literacy-Based Lessons

When planning strategic lessons, it is important to understand the purpose of the lesson and what the students will be able to do as a result of the lesson. Carefully consider the components of the strategic teaching model and the gradual release framework. Select before, during, and after literacy learning strategy/ies that best support the lesson outcome and plan instructional strategies that will help students connect with the purpose of the strategy/ies and better learn content. The choice of instructional strategy is important and should be carefully considered to make sure it truly fits the purpose of the lesson.

The following steps will be helpful reminders as you design your lessons.

Step 1: Plan a *Before Reading* Activity

What is the **purpose** of before reading activities? Is it to:

- Activate prior knowledge?

- Build background knowledge?
- Generate questions?
- Make predictions?
- Discuss vocabulary?
- Establish a purpose for reading?

Consider the **content** of the lesson:

- Is it a new concept to most of the students? If so, plan an activity that will allow students to build some background knowledge about the concepts.
- Is it a review of content students are familiar with? If so, select a strategy that will help students activate prior knowledge.
- Is there vocabulary in the lesson that may cause interference to understanding? If so, select an activity to explore and discuss unfamiliar words.

Step 2: Plan a *During Reading* Activity

What is the **purpose** of during reading activities? Is it to:

- Engage with text?
- Verify and formulate predictions?
- Summarize text?
- Self-monitor comprehension?
- Construct graphic organizers?
- Use mental imagery?
- Integrate new information with prior knowledge?

Consider the **content** of the lesson:

- Is the text challenging? If so, choose an activity that will require students to stop periodically as they read, reflect about what they have read, and self-monitor for understanding.
- Does the text structure present challenges to student understanding? If so, consider chunking (dividing into small sections) the text and choosing an activity that will allow small collaborative reading and sharing of the text to identify important information before large group discussion.

Step 3: Plan an *After Reading* Activity

What is the **purpose** of the after reading activities? Is it to:

- Reflect on the content of the lesson?
- Evaluate predictions?
- Examine questions that guided reading?
- Respond to text through writing?
- Retell or summarize?

Consider the **content** of the lesson:

- Does the lesson build upon previous learning? If so, consider an activity that allows students to make connections and evaluate new information.
- Does the content lend itself to visual representations? If so, consider providing students with graphic organizers as a format for organizing information and concepts.

- Does the content contain challenging vocabulary? If so, consider an activity that will lead to student ownership and understanding of the important vocabulary.
- Is the content open to interpretation? If so, consider activities that will promote discussion and critical thinking.

A planning worksheet for strategic lessons may look like the following template. The template is only a suggestion, but the format serves as a reminder to select instructional strategies that support students as they prepare, engage, and think about complex content text.

Planning Template for Connecting *Before, During,* and *After* Reading/Learning Strategies

Instructional Outcomes *Lesson:* *Standard/s:* *Content Learning Outcome:*
Literacy Instructional/Learning Strategy/ies: ***Before* reading/learning:** Materials: ***During* reading/learning:** Materials: ***After* reading/learning:** Materials:
***Before* Reading/Learning** *Literacy Outcome:* *Teacher facilitation:*
***During* Content Reading/Learning** *Literacy Outcome:* *Teacher facilitation:*
***After* Reading/Learning** *Literacy Outcome:* *Teacher facilitation:*
Next Steps:

Examples of completed lessons in each of the core content areas of English language arts, mathematics, science, and social studies are provided in the lesson plan section of the CCSSO Toolkit. A lesson narrative that depicts the classroom environment and implementation of the lesson plan is also provided for each of the twelve lessons. The lesson plans illustrate the best practices framework for using strategies to support all three phases of the reading/learning process. Most lesson plans also demonstrate the gradual release framework.

The literacy learning strategies provided in this Guide may be used across all content areas and they support students in developing key academic literacy habits and skills. These strategies are easy to learn and implement. Each can be used as a "stand-alone" strategy to support before, during, or after comprehension and critical response to content information and concepts. Most can be used in combination with one another.

PART II: LITERACY INSTRUCTIONAL STRATEGIES

This section defines various literacy instructional strategies. Each literacy strategy is described and cited with its originator, when available, since some of the strategies are synthesized from the work and research of several individuals. A list of purposes and benefits is provided to help teachers determine when use of a specific literacy strategy is most appropriate. Step-by-step directions for using the strategy in the classroom are listed along with several ideas for extending or differentiating the use of the strategies.

Following each strategy description is a quadrant chart, *Cross Content Sample*, which illustrates how each strategy might be used in a high school English, mathematics, science, or social studies class. Teachers are encouraged to read all four quadrants to see various examples of how the strategy can be used before, during, and after reading/learning. Teachers may shape and modify the strategies as needed to best support the learning strategies and content knowledge they want students to learn.

To summarize, the strategies are presented in the following order:

- The *Semantic Feature Analysis Chart* provides an overview of the 25 suggested strategies and the purposes for using them.
- Each *Literacy Support Strategy* lists the description, purpose, and directions for use.
- Each strategy has a *Cross-Content Sample* with instructions on how to use the strategy in English, Mathematics, Science, and Social Studies.

To deepen teacher understanding of how the literacy support strategies are used within a content lesson, many are described in detail in one or more of the core content lesson plans found in the lesson plan section of this Toolkit. Each lesson plan is accompanied by a lesson narrative, which illustrates how a teacher would teach the lesson, including the step-by-step process for before, during, and after learning. Lesson narratives also show student responses, illustrate how to engage students in learning by using the strategy, and identify what classroom interactions preceded and followed the lesson.

When trying to learn the strategies in isolation, it is not unusual for teachers to feel somewhat overwhelmed by the number of literacy strategies to choose from or how to implement those strategies into daily instruction. If this is true for you, begin with planning and practicing the use of one literacy strategy with your students and, as you become proficient with this strategy, you can add other strategies to your bag of instructional best practices. Of course, it is always less threatening and more productive if you are working with a peer or team of professionals to discuss the use of literacy support strategies and how to best integrate them into daily practice. Develop opportunities for shared teaching with a peer to observe and provide, as well as receive, feedback about becoming a *strategic teacher.*

Semantic Feature Analysis Chart: An overview of the literacy/learning strategies found in the last section of this Guide. The headings are strategies or practices recommended by the National Reading Panel. Use this chart to guide selection of strategies to meet the objectives or purpose when planning content lessons.

Strategy	Monitoring Comprehension	Using Graphic Organizers	Answering Questions	Generating Questions	Recognizing Text Structure	Summarizing	Activating Prior Knowledge	Collaborative Work	Developing Vocabulary
Analytic Graphic Organizer		x	x	x					
Anticipation/Reaction Guide	x		x				x		
Bloom's Critical Thinking Cue Questions			x						
Coding/Comprehension Monitoring	x								
Discussion Web			x	x		x			
Fishbowl Discussion			x	x		x			
Frayer Model									x
Group Summarizing						x		x	
Interactive Word Wall									x
Jigsaw	x		x	x		x		x	x
Knowledge Rating Guide			x						x
Paired Reading	x					x		x	
Problematic Situation	x						x		
Question-Answer Relationship	x		x	x					
Quick Write	x			x		x	x		x
Reciprocal Teaching	x		x	x		x		x	
ReQuest	x		x	x		x	x		
RAFT	x					x	x		
Save the Last Word	x				x	x		x	
Semantic Feature Analysis	x						x		x
Think-Aloud	x								
Triple-Entry Vocabulary Journal	x							x	x
Two-Column Note Taking	x								
Word Sort			x	x		x	x		x
Word Study									x

Analytic Graphic Organizers

Description

This strategy involves selecting a visual format like charts, diagrams, and graphs to help students explore the characteristics, relationships, or effects of a complex topic. This helps students organize their thoughts and construct meaning from text. Examples include cause/effect diagrams, compare/contrast charts, and process cycle diagrams.

Purpose

Use *during* and *after* reading to:

- Provide a visual way to analyze how information and ideas are linked
- Help organize information for note taking, learning, and recall
- Show specific relationships, such as cause/effect, sequence, and compare/contrast
- Synthesize information from different locations in the text or from multiple texts
- Convey understanding of information and concepts so misconceptions can be seen

Directions

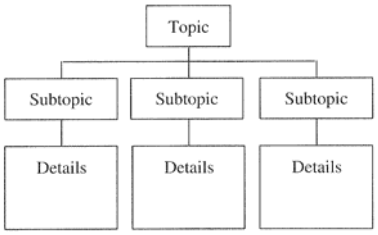
1. Explain the purpose of using a graphic organizer is to visualize how ideas link together.
2. If one specific graphic organizer is to be used for a whole group lesson, explicitly model and teach students how to insert information within that visual format.
3. If the lesson involves differentiated reading selections, show students a variety of graphic organizers and discuss how the shape of each graphic organizer shows how the information is connected.
4. Model for students how to select a graphic organizer depending on the purpose for organizing information: comparison, sequence, cause-effect, main idea supporting detail, pro/con evidence, and so on.
5. Help students organize information by selecting an appropriate graphic organizer from the sample charts and modifying it as needed to effectively organize information.
6. Assist students with placing information into the organizer in ways that will help them analyze the information effectively.
7. Ask students how completing the graphic organizer helped them understand the text differently. Students might discuss this using a Think-Pair-Share, or complete a Quick Write to respond.

Extensions

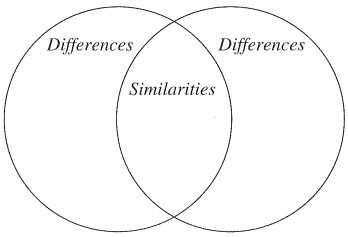
- Have students show their analytic graphic organizers to one another and compare their responses.
- Have students design creative variations of graphic organizers to fit the content.
- Have students use their completed graphic organizers as study guides, outlines for essays or other writing, or cue charts for question generating/answering a text (What is the main idea? What were the turning points in the chapter? What are the important steps in this process?).

Examples of Analytic Graphic Organizers

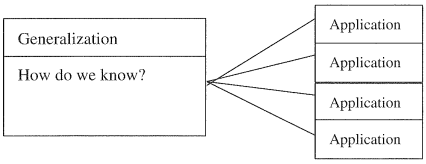
MAIN IDEAS



COMPARE/CONTRAST



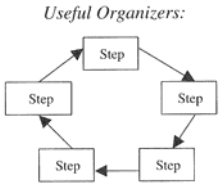
GENERALIZATION



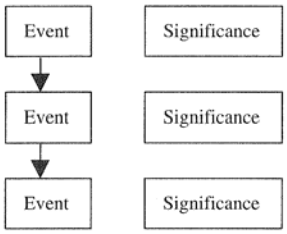
CAUSE/EFFECT

CAUSE(S)	EFFECT

PROCESS CYCLE



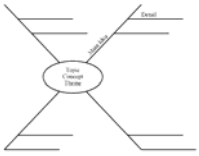
SEQUENCE



CONCEPT DEFINITION

Concept	Definition	Visual Illustration

CONCEPT MAP



PREDICTION ORGANIZER

My Prediction	Evidence For	Evidence Against	Actual Outcome

TRIPLE ENTRY JOURNAL

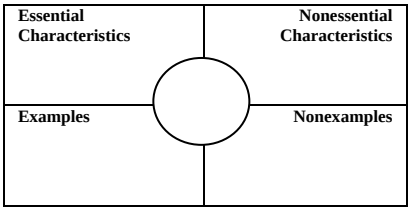
Quote/Page	Reflection	Example/ Illustration

PROPOSITION SUPPORT OUTLINE

Proposition:
Support:

1. Facts
2. Statistics
3. Examples
4. Expert Authority
5. Logic and Reasoning

FRAYER MODEL



Cross Content Sample
Analytic Graphic Organizers

English Language Arts	**Mathematics**
After reading a short story or novel Model or have students create a concept map about the theme that visually portrays how characterization, plot, setting, symbols, and other literary devices contribute together to develop the theme.	*After* reading a chapter on statistics Model or have students create a graphic organizer, such as a circle graph, Venn diagram, timeline, or histogram that visually portrays and compares statistical data.
Science	**Social Studies**
During and *after* reading of a chemistry text chapter on acids, bases, and salts Model or have students create a graphic organizer, such as a process cycle, cause/effect diagram, or a Frayer Model as a study guide that organizes information about these compounds as a study guide.	*During* and *after* reading about the causes of the Iraqi War of 2002 Model or have students create a graphic representation of the data that organizes facts and opinions in meaningful ways, such as a proposition support outline, a sequence chart showing events and significance, or a discussion web defining both the pros and cons of the war activities.

Anticipation/Reaction Guide

Description

This is a questioning strategy that assesses prior knowledge and assumptions at the pre-reading stage and evaluates the acquisition of concepts and use of supporting evidence after reading. (Herber, 1978; Duffelmeyer & Baum, 1992)

Purpose

Use *before*, *during*, and *after* reading to:

- Forecast and cue major concepts in the text to be read
- Motivate students to want to read text to see if prior knowledge is confirmed or disproved
- Require students to make predictions
- Activate students' existing background knowledge and set purpose for reading text
- Focus readers on the main ideas presented in text
- Help readers assess for misconceptions and reader-text discrepancies
- Create active interaction between reader and text
- Provide pre- and post-assessment information

Directions

1. Identify the important ideas and concepts students should focus on when reading.
2. Create 4–6 statements that support or challenge students' beliefs, experiences, and preexisting ideas about the topic. The statement should be reasonably answered either way.
3. Set up a table for student responses like the example below. Vary the anticipation and reaction categories as appropriate to the specific content, such as true/false, supported by evidence/not supported by evidence, or accurate/misrepresentation.

BEFORE READING				**AFTER READING**	
Agree	**Disagree**	**Statement**	**Page(s) where evidence found**	**Agree**	**Disagree**

4. Before reading the text, have students react to each statement in the *Before Reading* column individually and be prepared to support their position.
5. In small groups or as a whole class, ask students to explain their initial responses to each statement.
6. Ask students to read the selection to find evidence that supports or rejects each statement.
7. After reading the text, ask students to react to each statement in the *After Reading* column to determine if they have changed their minds about any of the statements.

Extensions

- For debatable topics, add two response columns—one for the student, one for the author—so the opinions can be compared and contrasted.
- Have students use additional sources of information to support opinions.
- Ask students to rewrite any false statements based on the reading, individually or in cooperative groups.

Cross Content Sample
Anticipation/Reaction Guide

English Language Arts	**Mathematics**
Before, *during*, and *after* reading *Romeo and Juliet* Have students anticipate and react to the text, using the response headings of *Agree/Disagree*, including statements such as: • Shakespeare is still relevant today. • Parents should have a say about whom a child chooses to marry. • Revenge has its place.	*Before*, *during*, and *after* reading a math textbook chapter on percents Have students anticipate and react to the text, using the response headings of *True/False*, including statements such as: • A 20% off sale is better than a buy one-get one free sale. • A mortgage of $1000 at 5% for 30 years is more expensive to pay off than $1000 at 7% for 30 years.
Science	**Social Studies**
Before, *during*, and *after* reading a global warming report issued by international scientists Have students anticipate and react to the text, using the response headings of *Supported by Evidence/ Not Supported by Evidence*, including statements such as: • Increasingly hotter temperatures around the globe show global warming is occurring. • Hurricanes will continue to increase in frequency, especially in southern locations. • Human causes are the leading reason for global warming.	*Before*, *during*, and *after* reading an informational Web site on voting Have students anticipate and react to the text, using the response headings of *Accurate/ Misrepresentation*, including statements such as: • More people voted for Independents in 2004 than in 2000. • More people switched parties in the 2004 election than in the previous four elections.

Bloom's Critical Thinking Cue Questions

Description

Cue questions related to the six thinking skills in Bloom's Taxonomy are purposely constructed to ensure students are stimulated to respond at all levels of the cognitive domain, especially the higher levels. Students may be asked to respond through quick writes, learning logs, tests, creative writing that answers the six levels of prompts, role-audience-format-topic (RAFT) activities, or other writing or speaking activities.

Purpose

Use *before*, *during*, and *after* reading to:

- Establish a purpose for reading
- Help students develop their thinking skills at all levels of cognition
- Ensure learning assignments respond to all levels of cognition
- Deepen student comprehension of text, especially at the higher levels
- Stimulate original thinking through the use of open-ended questions
- Provide an array of questions to support differentiation in students' products to demonstrate what they have learned

Directions

1. Assess the cognitive demands of the reading assignment to determine which of the six levels of thinking are required for students to understand what they are reading.
2. Explicitly teach the students about Bloom's Taxonomy of Critical Thinking and share a copy of the cue questions with them.
3. Use the cue questions to develop discussion or writing prompts in advance about the text and give the prompts to students before they read, to provide a purpose for engaging with the text.
4. Model how to respond to Bloom's thinking levels through think-alouds, whole group discussions, small group discussions, paired answers, and other methods so students learn how to answer cue questions at the six levels.
5. Once students are comfortable with the six levels of thinking skills, assign independent after-reading tasks using cue questions from the chart.

Extensions

- Provide choice for student responses by offering several cue questions from which they select one to answer for each of the six levels.
- Have students use the cue questions chart when previewing text before they read to set their own purposes for reading.
- Ask students to construct questions and answers about what they have read, using the cue questions on the chart.

Cue Questions Based on Blooms' Taxonomy of Critical Thinking

Lower-Order Thinking Skills	Higher-Order Thinking Skills
1. KNOWLEDGE • What is …? • How is …? • Where is …? • When did _____ happen? • How did _____ happen? • How would you explain …? • How would you describe …? • What do you recall …? • How would you show …? • Who (what) were the main …? • What are three …? • What is the definition of...?	**4. ANALYSIS** • What are the parts or features of …? • How is _____ related to …? • Why do you think …? • What is the theme …? • What motive is there …? • What conclusions can you draw …? • How would you classify …? • How can you identify the different parts …? • What evidence can you find …? • What is the relationship between …? • How can you make a distinction between …? • What is the function of …? • What ideas justify …?
2. COMPREHENSION • How would you classify the type of …? • How would you compare …? contrast …? • How would you rephrase the meaning …? • What facts or ideas show …? • What is the main idea of …? • Which statements support …? • How can you explain what is meant …? • What can you say about …? • Which is the best answer …? • How would you summarize …?	**5. EVALUATION** • Why do you agree with the actions? the outcomes? • What is your opinion of …? • How would you prove …? disprove …? • How can you assess the value or importance of …? • What would you recommend …? • How would you rate or evaluate the …? • What choice would you have made …? • How would you prioritize …? • What details would you use to support the view …? • Why was it better than …?
3. APPLICATION • How would you use …? • What examples can you find to …? • How would you solve _____ using what you have learned …? • How would you organize _____ to show …? • How would you show your understanding of …? • What approach would you use to …? • How would you apply what you learned to develop …? • What other way would you plan to …? • What would result if …? • How can you make use of the facts to …? • What elements would you choose to change …? • What facts would you select to show …? • What questions would you ask in an interview with …?	**6. SYNTHESIS** • What changes would you make to solve …? • How would you improve …? • What would happen if …? • How can you elaborate on the reason …? • What alternative can you propose …? • How can you invent …? • How would you adapt _____ to create a different …? • How could you change (modify) the plot (plan) …? • What could be done to minimize (maximize) …? • What way would you design …? • What could be combined to improve (change) …? • How would you test or formulate a theory for …? • What would you predict as the outcome of ...? • How can a model be constructed that would change …? • What is an original way for the …?

Cross Content Sample
Bloom's Critical Thinking Cue Questions

English Language Arts	**Mathematics**
During and *after* reading a classical novel with complex plot, characterization, and theme During reading, provide Bloom's cue questions for students to respond at all cognitive levels: knowledge, comprehension, application, analysis, evaluation, synthesis. After reading, provide the chart of cue questions for each of Bloom's six thinking levels and have students select and answer at least one question for each thinking level to communicate their learning.	*Before* and *after* reading a text chapter on measurements Before reading, have students activate prior knowledge and predict what will be learned "up" the six levels of Bloom's Critical Thinking Taxonomy by answering six one-minute Quick Write prompts created by the teacher from the cue question chart that relate to precision, accuracy, and units of measurement. After reading, have students review and revise the predictive responses to the Bloom's cue questions to check their understanding of how precision, accuracy, and measurement units affect mathematical predictions and estimates.
Science	**Social Studies**
During reading a text chapter, reviewing graphic depictions, and viewing a video on plate tectonics Structure a two-column note taking chart with prompts derived from Bloom's cue questions chart that require students to analyze, evaluate, and synthesize the information on plate tectonics and correlate it to geological features in today's world.	*Before*, *during*, and *after* reading editorials about the economic systems in several countries Have the students refer to Bloom's cue questions for the analysis, evaluation, and synthesis levels when writing a persuasive essay about the country with the most effective economic system. Show them how to justify their response by analytical comparisons, evaluative judgments about quality, and a synthesizing description about the ways other countries would benefit from adopting the selected economic system.

Coding/Comprehension Monitoring

Description

This strategy helps students engage and interact with text and monitor comprehension as they read.

Purpose

Use *during* reading to:

- Support content area learning by focusing on key concepts
- Provide a way for students to engage in a dialogue with the author
- Help students identify how they process information while reading
- Help students identify what is difficult in the text so they can select and apply comprehension strategies to support their reading
- Develop metacognitive awareness and ability to monitor one=s own comprehension

Directions

1. Explain that this strategy helps readers monitor their reading so they can identify what they do or don't understand.
2. Choose 2–3 codes that support the purpose of the reading and reinforce targeted literacy habits and skills.
3. Model the strategy using an overhead or whiteboard. Do a Think-Aloud while marking the codes so students witness the metacognitive process.
4. Guide the students in applying the coding strategy. Review the codes and have students code their reactions as they read on the page margins, lined paper inserts, or sticky notes.

   Possible Codes:

   \+ New information
   * I know this information
   ? I don=t understand/I have questions
   P Problem
   S Solution
   C Connection
   ✓ I agree
   X I disagree

Extensions

- Have students compare and discuss how they coded sections of the text.
- After students are comfortable with coding using the teacher-provided codes, encourage them to develop additional codes appropriate to the purpose for reading a particular text.

Cross Content Sample
Coding/Comprehension Monitoring

English Language Arts	**Mathematics**
During reading a memoir Engage students in a historical memoir about an unfamiliar period of history. Have students code with sticky notes using codes such as: C = connections to their own lives ? = confusing points X = disagreement E = author's essential experiences ! = universal themes	*During* reading the first chapter in a calculus textbook Assess students' comprehension of the initial chapter to determine needed instructional support for the difficult text, using codes such as: V = new vocabulary ? = I don't understand this sentence C = connects to algebra, trigonometry, or geometry X = I can't figure out this formula or graphic
Science	**Social Studies**
During reading of a local newspaper in an integrated science course Have students color code (with highlighters or sticky notes) information in the newspaper to identify science-related topics, such as: yellow = earth science pink = life science orange = physical science	*During* and *after* reading a world map Ask students to scan their text in small groups to locate information and code geographical characteristics related to upcoming instruction, such as: $ = many natural resources, such as oil # = highly populated ^ = early civilizations * = places I want to visit

Discussion Web

Description

This strategy promotes critical thinking by encouraging students to take a position for or against a particular point of view and requires them to establish and support evidence for their selected point of view based on their reading of narrative or expository texts. (Duthie, 1986)

Purpose

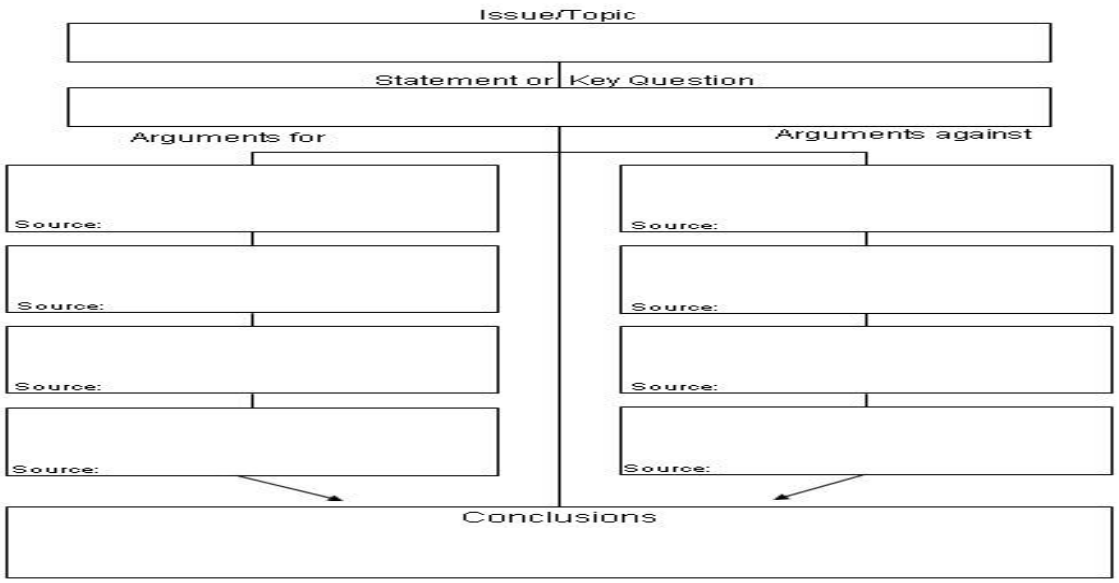
Use *during* or *after* reading one or more texts to:

- Provide a framework for analyzing an issue by citing evidence for or against a point of view before coming to a personal viewpoint
- Develop students' ability to draw conclusions based upon evidence, not opinion
- Provide opportunities for active discussion and collaboration
- Help students organize ideas for writing and use evidence to support their point of view
- Encourage the use of multiple resources to determine a conclusion
- Develop appreciation for diversity and understanding that there are two or more sides to every question
- Help students refine their thinking by listening to opposing information or ideas

Directions

1. Choose, or have students choose, an issue with opposing viewpoints.
2. Locate, or have students locate, a variety of resources that describe the issue.
3. Provide, or have students create, a guiding question to focus the discussion.
4. Have students work alone or in pairs to complete both sides of the discussion web, note text title and page numbers where they found the evidence, and form a tentative conclusion. Encourage them to be open-minded and suspend their personal judgment during the data collection.

Example of Discussion Web format



5. Have two pairs work together to review their discussion webs and add additional arguments. Have the four students discuss all the evidence and come to consensus about the strongest point of view, based on the evidence (not personal opinion).
6. Have students create a conclusion that summarizes the group's thinking and write it at the bottom of the group discussion web. Encourage them to avoid biased language.
7. Have each small group report their conclusions to the whole class. They should mention any dissenting viewpoints within their group. Limit the report to three minutes so all groups have time to present.
8. Have each student review his/her own tentative conclusion about the guiding question and then complete a one paragraph quick write that states the conclusion, citing the three to five key facts or reasons that support the conclusion. This individual response will help both the teacher and the student assess whether the student's conclusion is based on evidence provided in text as well as their prior background knowledge and experience.

Extensions

- Have students write a personal reflection about how the issue has impacted their lives or the lives of others they know.
- Have students write a response supporting the opposite point of view, using the opposing evidence from the Discussion Web.
- Have students do a formal debate or "town meeting" discussion. If possible, present to an authentic audience and solicit feedback.

Cross Content Sample
Discussion Web

English Language Arts	**Mathematics**
Before and *during* reading and writing about a controversial issue in today's world Create a variety of prompts about controversial issues for students to independently research and locate information on both sides of the issue, recording it on the Discussion Web in preparation for writing a persuasive essay that fairly portrays both sides.	*Before*, *during*, and *after* reading an introductory chapter about statistics applied to real life To introduce statistics, have students gather statistical information online and from newspapers and magazines around a topic of interest, such as sports, elections, or health issues, and form a hypothesis. Provide a Discussion Web template for them to record notes for and against their hypothesis when reading the articles and the text chapter on statistics. After reading, have students form a conclusion based on the Discussion Web information and be prepared to justify their point of view based on the statistical evidence.
Science	**Social Studies**
Before, *during*, and *after* reading online resources about space science Provide a controversial prompt to stimulate students thinking, such as "The United States should cancel its space program." Have students take pro and con notes on the Discussion Web template as they read various online resources in preparation for writing an editorial expressing their viewpoints that will be sent to NASA or the U.S. Congress.	*Before*, *during*, and *after* reading the U.S. Constitution Have students create their own prompt to analyze both sides of a constitutional issue affecting their lives or the world, then research text and online sources to find data supporting or refuting the issue using the Discussion Web format.

Fishbowl Discussion

Description

A classroom discussion strategy in which students are divided into two groups: the inner circle, or fishbowl, where several people hold a discussion, and the outer circle, where the rest of the students listen to and observe the discussion. At designated points the teacher selects new individuals, or individuals self-select, to enter the fishbowl and continue the discussion.

Purpose

Use *before*, *during*, and *after* reading to:

- Actively involve all students in open-ended discussion
- Provide a fast-paced mix of active participation and active listening
- Develop students' skills with impromptu dialogues
- Provide a novel way for students to gain information, analyze and evaluate it, and write a summary of their findings

Directions

1. Develop a scenario or series of questions around a topic you want students to discuss.
2. Select the initial group of students who will begin the fishbowl discussion. Create a list of students who will enter the fishbowl later or set up a procedure for students to tap into the discussion on a rotating basis.
3. Explain the purpose and procedure for the fishbowl discussion. Remind the observers to take notes on the content and the process.
4. Ask the first question or set up the scenario that will be discussed or role-played.
5. Listen for appropriate discussion "breaks," or time the rotations one to two minutes apart.
6. At the end of the discussion, have the students write a brief summary of the discussion, citing three to five critical points that support their conclusion. Ask them to respond to the question: "What would you have added to the discussion that wasn't said?"

Extensions

- Combine the fishbowl discussion with teacher- or student-generated *Problematic Situations* as a pre- and post-learning strategy. (The Problematic Situation strategy is explained later in this Guide.)
- Have observing students take notes and use the notes as the basis for an analytical or persuasive essay.

Cross Content Sample
Fishbowl Discussion

English Language Arts	**Mathematics**
After reading a novel with an inconclusive ending, let readers envision what happens next in the characters' lives Set up a conflict scenario between two major characters in the novel whose paths were linked, that is set shortly after the novel ends. Divide students into two character groups and provide time for them to plan what they think the character will do next. Have one member from each group enter the fishbowl to argue their point of view. Every minute or so, ring a chime and switch students, with the new participants picking up the dialogue from the cut-off point of the prior students.	*After* completing a technical math unit on fundamental concepts and operations Assign groups of two or three students to review specific concepts and operations including exponents, scientific notation, roots and radicals, addition and subtraction of algebraic expressions, equations, and other topics. Rotate each of the groups into the fishbowl for several minutes to explain the concept and operations, while the observers take study notes. Briefly provide oral feedback about what was well done and what information was confusing or in error.
Science	**Social Studies**
After reading about a controversial issue such as stem cell research Set up a scenario like a TV show where the host or hostess tends to "attack" the visiting guests. Divide the class into those who support or disagree with the use of stem cells for research, based on available information from newspaper articles, medical journals, or other sources of research. Have students who are supporting stem cell research develop a list of reasons why the experimental research should continue. Students opposed to the research will develop reasons as to why the research should not be allowed. Let the groups plan their dialogue for the interview. Then have one member from each group enter the fishbowl to begin the interview and periodically change the group until all students have been involved.	*After* reading about the government of a non-democratic country Set up a scenario where students will each portray a senior administrator of the government who is responsible for press conferences where each wants to create a favorable impression of their government system. Divide students into two groups representing the United States and the non-democratic country. Let them plan for a press conference. During the Fishbowl Discussion, have the rest of the class serve as reporters who call out questions. After each pair of students have responded to 1–2 questions, rotate other students into the fishbowl.

Frayer Model

Description

A Frayer Model is a graphic organizer that helps students form concepts and learn new vocabulary by using four quadrants on a chart to define examples, non-examples, characteristics, and non-characteristics of a word or concept. (Frayer, 1969)

Purpose

Use *before* or *after* reading to:

- Help students form an understanding of an unknown word or concept
- Help students differentiate between a definition of a concept or vocabulary word and those characteristics associated with it

Directions

1. Select the word or concept to be defined using the Frayer Model.
2. Show the Frayer Model and explain the four quadrants.
3. Model how to use the Frayer Model to define a concept, using a simple example students can understand.

Example:

Essential characteristics	**Non-essential characteristics**
• months • days of the week • dates placed on correct day of week for the year of the calendar	• photos or illustrations • dates of holidays • small box with previous or next month • space to record notes or plans
CALENDAR	
Examples	**Non-examples**
• wall calendar • desk calendar • checkbook calendar	• yearbook • birthday chart • diary

4. Have students brainstorm a list of words and ideas related to the concept and then work together to complete a Frayer Model. Students may need to use a dictionary or glossary for "clues."
5. Have students create a definition of the concept in their own words.

Extensions

- Describe rationale for examples and non-examples.
- Use the Frayer Model as a note taking strategy during reading.
- Change the titles of the boxes to include concept development categories.

Cross Content Sample
Frayer Model

English Language Arts	**Mathematics**
During and *after* reading a novel independently after class study of literary devices Have students identify the predominant literary device used in their novel, such as figurative language, symbols, or personification. On poster board, they should write the device in the center of a Frayer Model template and complete the four quadrants, leading to a definition of the literary device. Post the charts around the classroom to remind students of the literary devices that can be used when writing.	*Before*, *during*, and *after* reading the relatively easy first chapter on coordinates and directed line segments in the complex textbook for analytic geometry Initiate a class habit of creating Frayer Model examples of analytic geometry terms that can be duplicated and kept in the front of their math notebook, starting with the easier terms that were taught in earlier math courses. Have students work in small groups to create definitions of the key terms, such as real numbers, rational numbers, periodic decimals, line segments, and coordinates. Gradually have students become independent in creating Frayer Model definitions of essential course concepts.
Science	**Social Studies**
Before and *after* viewing a video about the properties and changes of properties in matter Before the video, use the Frayer Model strategy for one of the film's concepts, telling students they will be creating a Frayer Model for a term or concept they do not fully understand during the video. After the video, have students work in pairs to create a Frayer Model for the term or concept each student found difficult. Have each pair exchange their Frayer Models with another pair and offer feedback and additional ideas.	*Before*, *during*, and *after* reading about and taking a self-assessment of personality styles in a psychology course Have each student create a Frayer Model about his/her personality style that was revealed in the self-assessment, working alone or with others of the same style, as they prefer. Then, group students with different styles together to share their Frayer Models and explain their differing traits and behaviors.

Group Summarizing

Description

This strategy helps students work together to preview text before reading, locate supporting information and examples during reading, and summarize their ideas on a four-quadrant chart after reading. The charted information provides a structure to write the group summary.

Purpose

Use *before*, *during*, and *after* reading to:

- Involve students in constructing a meaningful synthesis of what they have read
- Help students learn how to do a summary before they are asked to create their own
- Provide practice in paraphrasing
- Allow students to demonstrate understanding of concepts through the completed group summary chart
- Link the different parts of the reading process
- Develop higher order critical thinking skills

Directions

1. Providing four major topics, model the group summary process by preparing a sample of a completed chart. Then set up the topics for a chart with prepared summary sentences. After students read, have them link the sentences to the topic/concept and write the sentences in the correct chart quadrant.
2. Divide students into small groups.
3. Have each student create a four-quadrant chart and label each quadrant with the topic or concept. Explain the purpose for reading is to learn important information about each of the topics or concepts they selected.
4. During reading, students jot down notes under each heading with page number references.
5. After students have read the text and make their notes, tell the group to discuss with one another what information and ideas they found that were important about the key words or concepts on the chart.
6. When the group agrees that the supporting information is important, it is added to the chart.
7. Once the charts are finished, ask the group to re-read what they have written and be sure their ideas are clearly expressed.

Sample Group Summarizing Charts

Part 1. Individual Ideas: As you read, take notes on your individual chart about important information related to the four key topics or ideas. List page numbers next to each note.

Key topic/Idea: _____	**Key topic/Idea: _____**
Key topic/Idea: _____	**Key topic/Idea: _____**

Part 2. Group Ideas: Discuss your ideas with your group and come to agreement on important information. Add the agreed-upon ideas to the group summary chart. Re-read the final chart to be sure all ideas have been clearly expressed.

Key topic/Idea: _____	**Key topic/Idea: _____**
Key topic/Idea: _____	**Key topic/Idea: _____**

Extensions

- Ask students to preview the text passage or chapter before reading to identify four major topics or concepts presented by the author.
- Have students create their charts on the whiteboard or wall poster, so others in the class can see how the ideas of different groups are similar or different.
- Have students use the group summary chart to write an individual summary.

Cross Content Sample
Group Summarizing

English Language Arts	**Mathematics**
After reading a complex thematic novel, such as *Break with Charity* Formulate four statements for students to respond to individually in the Part 1 quadrant chart, then work in groups to agree on summary points based on the novel for the Part 2 chart, such as: • The author's point of view regarding peer pressure versus friendship • The meaning of the Salem Witchcraft trials for today's teenagers • The historical accuracy of this novel • Lessons I learned about proving innocence when others perceive a situation differently	*Before, during,* and *after* reading a chapter on points, lines, planes, and angles Replace teacher front-loading with group summarizing to help students expand their initial understanding of key postulates to a more thorough understanding through peer group discussions. Possible postulates to summarize: • Ruler postulate • Segment addition postulate • Protractor postulate • Angle addition postulate
Science	**Social Studies**
Before, during, and *after* reading, watching demonstrations, and solving related problems about electrostatics Use group summarizing for an individual and small group review of primary concepts for the unit test, such as: • Conservation of charge • Coulomb's law • Charging by friction and contact • Charging by induction	*Before, during,* and *after* reading several civics text chapters about the functions of government Widen students' perspectives about government by having them individually summarize the crucial functions of government and check their understanding with their peers regarding: • Laws and rules • Distributed, shared, and limited powers • Organization and relationships of national, state, and local government • Operations of the U.S. government under the Constitution

Interactive Word Wall

Description

A Word Wall is a systematically organized collection of displayed words. Both students and teachers can suggest additions to Word Walls. Students are asked to interact with words on the Word Wall on an ongoing basis. In this way, the words become an integral part of students' reading, writing, and speaking vocabulary.

Purpose

Use *before*, *during*, and *after* reading to:

- Build vocabulary related to a particular instructional focus
- Help students develop analytical skills like classification and deduction
- Support students in their writing and other composing activities
- Build sight word reading fluency
- Provide a visual reference tool to help students remember important words related to a specific topic or focus

Directions

1. Create a list for a word wall that will help students deepen their vocabulary and enhance reading comprehension.
   Examples of word wall lists:
   - Words connected to an upcoming unit of study
   - Words connected to specific instructional areas (e.g., math order of operations, historical terms, literary devices)
   - Difficult words found in textbook chapter
   - Words connected to a theme, book, or author
   - Related root words with different prefixes and affixes
2. Refer to the word wall throughout the unit of study about the content concept it relates to, being sure students are actively interacting with the words on the wall.
   Examples of interactive activities:
   - Sort the words into categories and label them (list-group-label or word sort)
   - Use 3–5 words on the wall to write a summary sentence about a main concept
   - Create an analytic graphic organizer that relates the words to one another
   - Write a narrative piece—short story, poem, description—that links several words on the word wall together in a meaningful way
   - Create a word game using the words on the wall—a crossword puzzle, word search, paired compare/contrast

Extensions

- Have students keep a triple-entry journal with terms on the word wall.
- Have students create slide shows or visual presentations about the words on the wall.

Cross Content Sample
Interactive Word Wall

English Language Arts	**Mathematics**
During and *after* reading and writing descriptive essays As students read exemplary descriptive essays, create a Word Wall of adjectives that create vivid word pictures. Have students interact with the words, such as: • Identifying them during reading and discussing how they create reader interest. • Revising a non-descriptive essay to a descriptive one by adding colorful, specific adjectives from the Word Wall. • Creating an original piece using at least 15 adjectives from the Word Wall. • Editing each others' descriptive essay drafts to provide feedback about adding adjectives to create visual imagery.	*After* reading a text chapter on probability and solving problems related to coin and die tossing Help students understand the importance of probability in today's world by creating an Interactive Word Wall of real life applications that are related to probability, e.g., weather forecasting, winning a sports championship, defective parts, living to age 100, or winning a national lottery. Have students interact with the Word Wall terms, such as : • Researching and calculating the probability for one of the Word Wall applications. • Writing a short persuasive essay on the importance of understanding mathematical probability, related to three or more Word Wall applications.
Science	**Social Studies**
Before, during, and *after* reading articles in a computer technology course about the new "thinking" technology called the Semantic Web As the class reads articles about the Semantic Web, have students create a Word Wall with important terms, such as search engine, algorithms, relational database, RDF, GPS, logic engine, DNA computer, cubits, and quantum computing. Have students interact with these words, such as: • Creating Triple-Entry Vocabulary Journal entries about each word on the wall that include a definition in their own words and a visual memory aid. • Writing a short Quick Write defining the Semantic Web, using at least nine terms from the Word Wall. • Drawing a Venn diagram that compares the World Wide Web and Semantic Web using Word Wall terms.	*During* and *after* reading a chapter on the ways production, distribution, and consumption differ in various countries in a Economics class As students read about these systems, have them create Word Wall cards and post them under one of the three categories on the wall: production, distribution, and consumption. Have students interact with these words, such as: • Scrambling the words on the wall and asking students to list and group the words into the three systems of production, distribution, and consumption. • Having students select a country they have studied and pick one word from each of the three systems that best represents that country's systems of production, distribution, and consumption. • Having students select a word from the wall and do a short charade or role play, having other students guess the word they are portraying.

Jigsaw

Description

Jigsaw is a group learning strategy where students read different selections and are responsible to share that information with a small group. It is effective for involving all students in a learning task and provides opportunity for differentiated learning. (Aronson et al., 1978)

Purpose

Use *during* and *after* reading to:

- Involve students in reading and communicating what they have learned with their peers
- Address a wide range of student abilities and interests through reading tasks of differing reading levels, genres, text length, and topics
- Provide a way to connect different types of reading materials linked to a common theme
- Help students develop reading, listening, and speaking skills and learn from others how to construct and convey important concepts from written text
- Engage students through small group interactions
- Support understanding about a topic without having every student read every reading selection
- Provide practice in synthesizing important information from text and communicating that information to others

Directions

1. Identify what students need to learn for a unit of study and locate three to six selections that contain the desired content information. Try to vary the reading levels and select high interest materials. To avoid confusion during grouping, mark each selection with a number or color code.
2. Organize students into groups of three to six members, depending on the number of selections to be read.
3. Assign, or ask team members to select, one selection for which each will be responsible to read independently and communicate the information learned to the whole team.
4. Explain the jigsaw process and how learning will be evaluated, such as an individual quiz.
5. Provide time for students to read their selection and take notes or create a graphic organizer that lists the important concepts and supporting details from their reading.
6. Re-group the students who have been assigned the same selection, using the selection number or color code.
7. Have the same-selection groups share their notes and discuss how to present the information back to their small groups.
8. Return to the original group where each student is responsible to explain the key concepts of their reading selection to the other group members who did not read that selection.

Extensions

- Use the jigsaw for independent inquiry topics within a general unit of study.
- Have each same-selection group form three or four essential questions to be used for post-assessment of the learning.

Cross Content Sample
Jigsaw

English Language Arts	**Mathematics**
After small group reading of four novels on the theme of courage, using Literature Circle discussions After Literature Circle discussions on the topics below, form Jigsaw groups, with one representative for each novel, to compare and contrast: • The author's point of view about courage • Examples of courageous actions of characters • The plot problem, crisis, and denouement about courage • Examples of how figurative language, symbols, and other literary devices were used to develop the theme of courage	*Before* reading the instructions for the scientific calculator in a Technical Math course Activate prior knowledge by having four small groups of students discuss what they already know about one type of calculator features, then break into jigsaw groups for students to lead the review of calculator keys and operations with their peers: • Data entry • Arithmetic operations • Special functions • Combined operations
Science	**Social Studies**
Before, *during*, and *after* reading text and online materials about the cardiovascular system Form study groups to collaboratively read and research one of the three areas below, then form jigsaw groups after reading is completed for peers to share materials and teach each other the essential components and related vocabulary for each system: • Blood composition • The heart • Vessels and blood circulation	*Before*, *during*, and *after* reading about the early Roman world and the expansion of Rome Have students self-select from the following topics for small group research, followed by jigsaw presentations that include information, visual depictions, and links to today's world: • The arts of government • Roman life and society • The Latin novel • Roman art and architecture • Cicero and Rome • Virgil's poetry

Knowledge Rating Guide

Description

A *before*, *during*, and *after* reading activity in which students analyze their understanding of vocabulary words or concepts from the text or unit of study. (Blachowicz, 1986)

Purpose

Use *before* reading to:

- Introduce list of key terms to students
- Determine students' knowledge of a word or concept
- Activate existing background knowledge
- Help students make connections to new concepts
- Assess learning when used *before* and *after* reading

Directions

1. Select a list of important terms from the text. Prepare a handout that lists the terms followed by three columns: *Know it/Use it, Can describe it/Don't use it, Don't know it/Don't use it.*

Term	**Know it/ Use it**	**Can describe it/ Don't use it**	**Don't know it/ Don't use it**

2. Give the Knowledge Rating Guide with the terms to students. Ask each student to rate their level of knowledge about each term by placing an *X* in the appropriate column.
3. Place students in small groups to talk about the terms and/or lead the class in a discussion about the terms students know.
4. Ask students to read the text.
5. After reading the text, have students reexamine their sheets and see what words they can now define/use.

Extensions

- Ask students to write definitions/explanations of terms they marked in the *Know it/Use it* column.
- Before discussing the terms as a class, have members of each small group discuss the terms and explain them to one another, and only discuss as a class the terms no one knows.

Cross Content Sample
Knowledge Rating Guide (KRG)

English Language Arts	**Mathematics**
Before writing to determine beginning knowledge of narrative, descriptive, informative, and persuasive essays Assess student understanding of writing formats by creating a KRG which lists the primary components of each form of essay, such as: Persuasive essay: • Create a "hook" to engage the reader • Support opinion with evidence • Use a convincing, positive voice • Write a logical argument • Avoid bias or generalizations • Select persuasive vocabulary	*Before* and *after* a unit on trigonometric functions of angles Use the KRG to pre- and post-assess student understanding of key trigonometric functions, and related vocabulary, such as: • Degrees and minutes • Abscissa (x-value) • Ordinate (y-value) • Radius vector • Sine • Tangent • Secant • Cosine • Cotangent • Cosecant
Science	**Social Studies**
Before, *during*, and *after* reading text, online, and media resources about atomic structure Use the KRG to stimulate interest and activate knowledge about atomic structure by using a mix of statements related to atomic theory and authentic real-life applications, such as: • Artificial ingredients in foods • Dalton's atomic theory of matter • Static electricity in the home (dryer, rug, pet) • Cathode rays • Electrons • Nuclear power plants • Nuclear atom • Atomic numbers	*Before*, *during*, and *after* reading Adam Bagdasarian's *Forgotten Fire*, a semi-biographical novel of a child survivor of the 1915 Armenian genocide by the Turks Create a KRG that helps students anticipate, comprehend, and critically respond to the novel's essential themes and concepts that are still relevant in today's troubled world, such as: • Why a country wants to control another country and how it justifies its actions • Countries where one religious group tries to control or eliminate another religious group • True or fictional stories of child survivors of a war and the characteristics of a survivor • Impact of the death of a parent or other family members • How the spirit helps one endure even when one knows that each day could be the last

Paired Reading

Description

This strategy helps students in being actively involved in the structured reading aloud of a shared text. Students benefit from the intensive sessions of reading, speaking, and active listening.

Purpose

Use *during* reading to:

- Give students practice in oral reading; to build fluency
- Provide practice with active listening, reading aloud, and summarizing
- Promote active engagement with reading
- Develop specific skills related to reading comprehension

Directions

1. Basic paired reading requires establishing ground rules about when and how help will be asked for/offered when reading, how turns will be taken, and what each role will include. One basic set of ground rules might be the following:
    - In pairs, take turns reading a paragraph at a time from an assigned reading.
    - The reader reads in a low voice, loud enough only for the listener to hear.
    - When the reader completes the paragraph, the listener provides a summary of the paragraph that needs to be "approved" by the reader. If the summary is not clear or accurate, the pair goes back to the text and rereads silently to add what is necessary.
    - Then the two switch roles, with the first reader becoming the active listener and summarizer.
    - If the reader stumbles on a word or is having difficulty, the reader can ask for help from the partner. If help is not asked for, then the listener should give the reader the opportunity to figure it out.
2. Give directions for what the pair should do when they are done with the reading. This might include: discussing what they each found interesting about what they have read, answering questions or completing a graphic organizer together or separately, interviewing another pair about their reading session (what went well/what did not), asking pairs to contribute three interesting words (or words that meet specific criteria) from their reading to the Word Wall, adding to their learning log or journal based on what was read, or asking the partners to write a collaborative summary of what they read.

Extensions

- Have students extend the listening/summarizing role to include clarifying, predicting, and questioning.
- Let readers read for longer segments of the text than just a paragraph before switching roles.
- Give pairs a set of cards that direct them to do different things with the text: visualize, clarify, make a connection, etc. The listener picks a card before the reader begins to read and then shares according to the card after the reader completes the section.

Cross Content Sample
Paired Reading

English Language Arts	**Mathematics**
After viewing the video and *during* the reading of Shakespeare's *As You Like It* Model for students how to do a Paired Read using Jaques' speech, *The Seven Ages of Man*. Show students how they are to summarize the plot actions and the ways character actions and dialogue show how the character feels about life. Then have students do Paired Reads intermittently throughout the reading of the play to help students comprehend difficult sections.	*During* reading of review information about algebraic expressions prior to the unit on functions and graphs Use Paired Reads to have students read and summarize the text pages on addition, subtraction, multiplication, and division of algebraic expressions. Tell students to focus their summaries on defining the related math terms, and recognizing an example when mathematically represented in numbers and symbols.
Science	**Social Studies**
During the text review and *before* the lab experiment for Newton's Second Law of Motion—force and acceleration Have students do a Paired Read to summarize the text explanations of Newton's Second Law with the key outcome of understanding: • The proportional relationship between acceleration and net force • The inversely proportional relationship of acceleration and mass • Reactions that will occur when acceleration, net force, or the mass changes	*Before*, *during*, and *after* reading about Roosevelt's New Deal Have pairs of students read about the New Deal in a variety of texts or online resources. Stress that during their summary responses, students should focus on learning how the New Deal would impact American life in relation to: • Labor and employment • Housing • Business and the economy • Farm programs and rural life • Retirement • Everyday life (e.g., repeal of prohibition)

Problematic Situation

Description

A strategy whereby teachers introduce a compelling problem or scenario that establishes a purpose for reading to engage student interest and stimulate inquiry. (Vacca & Vacca, 1993)

Purpose

Use *before*, *during*, and *after* reading to:

- Activate students' existing background knowledge
- Motivate students to want to read text and explore ideas
- Make connections to new concepts
- Focus readers on the main ideas presented in text
- Help readers analyze problem/solution relationships
- Ask students to provide supporting evidence

Directions

1. Design a motivating, problematic situation to stimulate students' interest about important information or concepts in the text material they will read. The situation should be authentic and require analytical or evaluative thinking to resolve. As appropriate, include affective components (e.g., emotions, values) in the "problem."

   Examples of problematic situations

   Social Studies Assignment: Read chapter 7, *Ratifying the Constitution.*
   As a newspaper reporter in the late 1780s, you have been asked to write an editorial determining if the process established for ratifying the Constitution is fair. The publisher also wants you to discuss whether or not the Constitution should be ratified. Based on your knowledge of that time period, what arguments would you include in your editorial?

   Science Assignment: Energy article, www.eia.doe.gov/kids/renew/renewables
   A company called Northeast Energy recognizes the limited supply of fossil fuels and they have been encouraging their clients to conserve energy. While conservation is an important step, at some point in the not-so-distant future, they realize our supplies of fossil fuels will be depleted and we will be forced to rely completely on alternative energy sources. You have been contracted to evaluate the feasibility of using perpetual and renewable energy sources to provide power for their client, particularly solar, wind, hydroelectric, geothermal, biomass, and nuclear power. They are also interested in any other alternatives to fossil fuels. What information can you provide that will help them in their future planning?

2. Prior to asking students to read one or more text selections, introduce the problematic situation and, in cooperative groups, ask them to brainstorm possible results or solutions to the problem. Suggest each group record their responses and discuss the pros and cons of each solution. Have the groups share their thinking with the whole class.
3. Ask students to read the text selection, looking for information that supports their solutions.
4. Ask students to refine or modify their initial solutions as they gain evidence from their reading.

Extensions

- Have students locate and use additional sources of information to support solutions.
- Ask students to consider whether some of their own solutions might be preferable to the one presented by the author.
- Use notes and responses as the basis for an analytical or persuasive essay.

Cross Content Sample
Problematic Situation

English Language Arts	**Mathematics**
After reading Fitzgerald's *The Great Gatsby* To help students connect with the culture and behaviors of the century before them, set up a problematic situation that involves them in a reenactment of a portion of the novel, such as Jay Gatsby's party in chapter 3: Example: You have been asked to plan a party with a Roaring Twenties (Jazz Age) theme. Based on your knowledge of this period of time, you need to determine what would be appropriate entertainment; who should be on the guest list; what your guests should be wearing; and what food and drink you would serve. In addition, what might be happening that your guests might be discussing?	*After* reading chapter on measurement units, systems, and processes of measurement Create an applied, real-life Problematic Situation that will demonstrate student understanding of key ideas from their reading, such as: Example: Your family is planning a trip to Canada where distance is measured in kilometers, not miles. After hearing a friend describe a serious accident he caused because he didn't know about the different measurement systems, you decide to generate step-by-step instructions for your family to use for converting miles to kilometers, U.S. currency values to Canadian money, and gallons to liters. Select the most relevant equivalencies for drivers to know how to pay tolls, fill up the tank, and understand speed limits.
Science	**Social Studies**
Before, during, and *after* reading text and online resources about alternative energy Set up a problematic situation to stimulate student inquiry about the impact of alternative energy. Example: Northeast Energy recognizes the limited supply of fossil fuels and they have been encouraging their clients to conserve energy. While conservation is important, at some point in the not-so-distant future, they realize that our supplies of fossil fuels will be depleted and we will be forced to rely only on alternative energy sources. You have been contracted to evaluate the feasibility of using perpetual and renewable energy sources to provide power for their client, particularly solar, hydroelectric, wind, geothermal, biomass, and nuclear power. They are also interested in any other alternatives. What information can you provide that will help them in their future planning?	*After* reading about the writing and ratification of the Constitution Have students develop persuasive writing skills in conjunction with the study of Constitutional history by setting up a creative way for them to evaluate the ratification process and communicate their learning, such as: Example: As a newspaper reporter in the late 1780s, you have been asked to write an editorial determining if the process established for ratifying the Constitution is fair. The publisher also wants you to discuss whether or not the Constitution should be ratified. Based on your knowledge of that time period, what arguments would you include in your editorial?

Question-Answer Relationship (QAR)

Description

This strategy involves students in assessing the thinking demands of a passage and developing answers for four types of questions: *right there* (answer is directly stated in text); *think and search* (answer is in the text, but not stated directly); *author and me* (the answer is not in the text; it is derived from integrating the author's information with one's own background knowledge and experiences); and *on my own* (the answer is not in the text; the reader must develop the answers solely from background knowledge).

Purpose

Use *during* reading to:

- Characterize questions and know where to look for the answers
- Refute common misperception by students that the text tells all
- Become more analytical and evaluative about responding to questions
- Separate factual, implied, inferred, and predictive information while reading
- Determine the supporting evidence for responses to questions
- Monitor comprehension of text

Directions

1. Prepare a sample text reading with several questions that correspond to the four QAR types.
2. Ask students how they locate or determine the answer to questions about text. Explain that this strategy helps them determine how to seek answers to questions in text.
3. Show students the four types of QAR questions.

1. In the book The answer is stated directly in the text.	**2. Think and search** The answer is in the text but is not stated directly. The reader interprets the meaning from different parts of the text.
3. Author and me The answer is not in the text. The reader must read the text in order to answer, but must use personal knowledge with the information provided by the author.	**4. On my own** The answer is not in the text. The reader must develop the answer based on knowledge and personal experience only.

4. Introduce several examples of "right there" questions, then introduce several "think and search" questions. Emphasize that these types of questions require locating information within the text.
5. Introduce several "author and me" and "on my own" questions for the same text reading.
6. Then provide guided practice in pairs or small groups with several progressively longer pieces of text.
7. As students become more proficient, provide independent practice and give feedback to individual students about their QAR choices.
8. Once students can effectively use QAR to answer questions, have them generate their own questions to practice the various types and use QAR independently.

Extension

- Link the QAR types of questions to Bloom's Taxonomy of Critical Thinking: the Right There questions require only the knowledge level of abstraction; the Think and Search questions add the comprehension and application levels; the Author and Me questions add analysis; and On My Own questions require evaluation and synthesis.

Cross Content Sample
Question-Answer Relationship (QAR)

English Language Arts	**Mathematics**
After reading a short story followed by comprehension questions in an American literature anthology Use the QAR to help students understand whether the questions are literal or require analytical, evaluative, or inferential thinking, such as *The Diary of Anne Frank:* • *Right there*: Who is in the house besides the Franks? • *Think and search*: Who makes the rules, Mr. or Mrs. Frank? • *Author and me*: Why is Anne rebellious? • *On my own*: What would you have done differently from Anne?	*Before, during,* and *after* reading a variety of data charts and graphs Use the QAR to help students determine if the answer is provided in the data display or whether analysis, manipulation, computation, or calculation is needed to respond to the different kinds of questions: • *Right there*: The specific number is provided • *Think and search*: The answer is there, but I need to understand the structure of the chart to locate the answer • *Author and me*: I can figure out the answer from the data if I do some calculations • *On my own*: The data doesn't provide a specific answer; I have to manipulate the data and figure it out on my own
Science	**Social Studies**
After reading a variety of articles on global warming Model the QAR question development with one article and then have small groups of students practice creating their own QAR questions to analyze the facts and opinions in the articles, using the following cue words to identify the type of question: • *Right there*: who, where, list, when, how many, name, what, based on this passage • *Think and search*: summarize, what caused, contrast, explain, retell, how did, find • *Author and me*: in what instances • *On my own*: what do you think, based on your experience, if you were this person	*During* reading a text chapter about slavery and the Underground Railroad To provide practice for students in understanding that textbook writers and test publishers often use the same four kinds of questions, have students answer the end of chapter questions, coding each question with the appropriate QAR type: • *RT = Right there* • *TS = Think and search* • *A&ME = Author and me* • *ME = On my own* Before they submit their answers, have them review their QAR codes with another student to see if they agreed on the type of question that was asked and if the strategy helped them find the best answer to the questions.

Quick Write

Description

A versatile strategy used to develop writing fluency, to build the habit of reflection into a learning experience, and to informally assess student thinking. The strategy asks learners to respond in 2–10 minutes to an open-ended question or prompt posed by the teacher before, during, or after reading.

Purpose

Use *before*, *during*, and *after* reading to:

- Activate prior knowledge by preparing students for reading, writing, or a discussion
- Help students make personal connections
- Promote reflection about key content concepts
- Encourage critical thinking
- Organize ideas for better comprehension
- Increase background knowledge when shared
- Synthesize learning and demonstrate understanding of key concepts
- Reinforce vocabulary
- Provide a purpose for reading
- Assess student knowledge on the topic prior to reading

Directions

1. Explain that a Quick Write helps engage students in thinking about a content topic before, during, and after reading. Stress that in a Quick Write, students respond to a question or prompt related to the text by writing down whatever comes to their minds without organizing it too much or worrying about grammar.
2. Select a topic related to the text being studied and define the purpose for the Quick Write:
   Examples:
   - Summarize what was learned
   - Connect to background information or students' lives
   - Explain content concepts or vocabulary
   - Make predictions, inferences, and hypotheses
   - Pose a question that addresses a key point in the reading selection
3. Tell the students how long they will have to do the writing, typically 2–10 minutes.
4. Use the Quick Write as part of instruction, assessment, and discussion.
   Note: Typically a Quick Write is graded only for completion, not for quality or accuracy.

Extensions

- Quick Writes can be assigned as part of students' Learning Logs or Journals.
- Quick Writes can be used to think/brainstorm for a Think-Pair-Share.
- Students can generate their own Quick Write questions and prompts.
- Students can share their responses in small groups and compare their answers.
- Students can work in small groups to create a Quick Write, with each student offering one sentence in a round-robin fashion.

Cross Content Sample
Quick Write

English Language Arts	**Mathematics**
Before, *during*, and *after* reading fiction Create open-ended prompts to help students align the piece of fiction with their own lives, such as: • Characters in literature make decisions that have consequences for themselves and others. What is a decision you made that had unanticipated consequences, both for yourself and others? • Describe a time you had to piece together clues to solve a mystery in your own life.	*Before*, *during*, and *after* reading a math text selection Help students learn to express their thinking and understanding of math concepts by having them describe their thoughts in short, non-graded writing. Examples: • What does it mean to "solve" an equation? • What kind of quadrilateral do you feel is most "balanced?" Why do you think that is so?
Science	**Social Studies**
Before, *during*, and *after* reading any text information Have students do a Quick Write based on a prompt that asks them to summarize, analyze, or evaluate scientific concepts, such as: • Light travels through the air at 3×10^8 m/s. This is also the speed limit of the universe. Explain the meaning of 3×10^8 m/s. What does it mean to say that the universe has a speed limit? • Brainstorm a list of everything you know about the causes and effects of global warming on the environment.	*Before*, *during*, and *after* reading Use the Quick Write to stimulate higher order thinking—analysis, evaluation, and synthesis—with open-ended prompts that go beyond literal comprehension of the historical information. Examples: • We are going to study recent efforts to achieve a Middle East Peace Accord. Who are the key political figures you think are likely to influence this effort and why? • Imagine that you lived 30,000 years ago during the Stone Age. How did you use natural resources to survive?

Reciprocal Teaching

Description

Reciprocal teaching is a collaborative routine for improving reading comprehension. Four-person teams use the skills of summarizing, questioning, clarifying, and predicting to bring meaning to the text. (Palinscar and Brown, 1984)

Purpose

Use *during* reading to:

- Improve students' skills at summarizing, questioning, clarifying, and predicting
- Help struggling readers practice the habits and skills of strong readers
- Encourage collaborative exploration of text

Directions

1. Create groups of four students.
2. Distribute one note card to each member of the group identifying each person's role.
   a. summarizer
   b. questioner
   c. clarifier
   d. predictor
3. Have students silently read a few paragraphs of the assigned text selection. Encourage them to use note taking strategies, such as selective underlining or sticky notes, to help them better prepare for their role in the discussion.
4. At the given stopping point, the Summarizer will highlight the key ideas up to this point in the reading.
5. The Questioner will then pose questions about the selection.
6. The Clarifier addresses confusing parts and attempts to answer the questions.
7. The Predictor can offer guesses about what the author will tell the group next.
8. The roles in the group then switch one person to the right, and the next selection is read. Students repeat the process using their new roles. This continues until the entire selection is read.
   Note: It is important to teach, model, and practice each of the four roles/skills before expecting students to do all four together.

Possible Verbal Prompts:

Summarizing:	The important ideas in what I read are _____
Questioning:	What connections can I make? How does this support my thinking? What is the author telling me by this comment?
Clarifying:	I don't understand the part where _____ I need to know more about _____
Predicting:	I think_____, I wonder_____, I predict_____

Extensions

- Use with Paired Reading or Save the Last Word for Me
- Have students write individual summaries after they finish reading the selection together.

Cross Content Sample
Reciprocal Teaching

English Language Arts	**Mathematics**
During small group reading of a novel, play, short story, or other genre Adapt Literature Circle roles to the four roles of Reciprocal Teaching, rotating them at appropriate pause points in the text reading and specifying areas of focus to deepen the discussion past literal interpretation. Example for Quiroga's *The Alligator War*: • *Summarizer*: Parallel the alligator behaviors to people's behaviors during the summary. • *Questioner*: Ask only questions that require inferential thinking. • *Clarifier*: Be the wise old alligator when you respond to the questions. • *Predictor*: Compare human beings to alligators in predicting what will happen if a warship again goes up the river.	*During* small group completion of college entrance exam practice tests Involve students in actively discussing the types of exam questions and techniques for answering them by applying the Reciprocal Teaching roles to the sample questions: • *Summarizer*: State numerical math problems in words or word problems in numbers and symbols. • *Questioner*: Ask about vocabulary or process steps to solve the problem. • *Clarifier*: Explain vocabulary or process steps. • *Predictor*: Predict the detractor answer test makers include is easy to select if the problem isn't carefully thought out.
Science	**Social Studies**
During reading of a difficult chemistry chapter on chemical equilibrium and Le Chatelier's Principle Have students take on the four roles of *Summarizer*, *Questioner*, *Clarifier,* and *Predictor* after reading each of the sections. Tell each role to focus on specific content when reading: The *Summarizer:* Focus on the opening and closing paragraphs of each 1–2 page section The *Questioner*: Read the Section Review Questions and ask the group any you don't understand yourself. The *Clarifier*: Review the graphs and figures that explain the reactions. The *Predictor*: Read the sample problems and Chemistry in Action tips to predict why it matters for students to understand chemical equilibrium.	*Before*, *during*, and *after* reading a chapter on problems of the presidency with the case study of Watergate Ask small groups of students to compare the President's problems during Watergate with the problems of today's President, focusing on the theme: does the President have too many jobs and too much power? Have students guide their discussion by taking on the four roles of Reciprocal Teaching: *Summarizer*, *Questioner*, *Clarifier,* and *Predictor.*

ReQuest

Description

This strategy helps students develop the ability to ask and answer questions about their reading to deepen comprehension and critical thinking. Students take on the role of the teacher to form questions about a reading selection and the teacher models how to answer. Then the teacher asks questions that require higher level thinking to influence the students to frame more challenging questions about the ideas presented in the reading selection. (Manzo, 1969, 1985)

Purpose

Use *during* reading to:

- Build students' abilities to generate good questions about their reading
- Allow students to hear well-defined answers and learn the mental processes behind them
- Allow students to hear different perspectives about the same text
- Help students differentiate lower level informational questions from higher level questions that demand analysis, evaluation, or synthesis
- Help students monitor their learning through questioning

Directions

1. Discuss how teachers select the questions they ask students from the text.
2. Tell the students they are to take on the role of a teacher while reading and develop questions about the information, ideas, and relationships found within the content.
3. Have the students read a portion of the selection independently and write a list of questions.
4. Invite the students to ask the teacher their questions. The teacher responds with clear, complete answers in a think-aloud fashion that shows students the mental process the teacher used to derive the answer.
5. When students have finished asking their questions, the teacher asks the students a few questions about the same passage. These questions should focus on higher level thinking to guide the students in framing more challenging questions with the next selection.
6. Repeat the process with the next portion of the selection.
7. After three or four segments are discussed using ReQuest, have the students predict how the selection will conclude and have them read the remainder of the selection independently.

Extensions

- Form small groups to work together and revise the questions before posing them to the teacher.
- Ask students to define the strategies they used in writing their questions.
- Give students questioning prompts based on Bloom's Taxonomy of Critical Thinking to help them learn how to ask questions that demand higher order thinking.
- Combine ReQuest with the Question-Answer Relationship (QAR) strategy to help students ask literal, inferential, and evaluative questions.
- Once students are comfortable with teacher-student ReQuests, have them do Reciprocal Peer Questioning. (King, 1990)

Cross Content Sample
ReQuest

English Language Arts	**Mathematics**
Before writing a major research paper To remind students of the criteria and proficiencies expected for the research paper, have students skim a variety of classroom resources on effective writing to identify questions related to thesis statements, supporting ideas/evidence, voice, mechanics, citations, and other elements of the grading rubric. Hold a ReQuest session to review the research parameters to ensure all students know the expectations for quality in their written research.	*Before* reading and solving problems in the initial chapters of an Analytic Geometry text To review essential elements of arithmetic, algebra, and trigonometry that are used in analytic geometry, provide small groups of students with text selections related to the three areas. Have students take on the role of the teacher as they read, forming questions to guide the review. Convene the whole class and use ReQuest for an interactive review, modeling to students the clarity of mathematical communication you expect them to aspire to during this course.
Science	**Social Studies**
During reading and learning about the structure and mechanics of change in DNA During the DNA unit, begin each class with a 10 minute ReQuest about the previous day's learning and the homework reading. Encourage students to identify questions about the processes in both healthy and unhealthy persons. Examples: • Cellular reproduction beginning with the double helix theory of DNA structure and function • Relationships between the anatomical and biochemical processes in determining heritable characteristics • How genetic engineering can result in new combinations of genes and new inherited characteristics • The beneficial and harmful nature of organisms • The evolutionary processes in terms of diversity that are factually observable	*Before*, *during*, and *after* reading a biography of a historical figure Have students create interview questions before, during, and after they read the biography in preparation for a student-to-student ReQuest discussion formatted like a TV interview show. Stress that their questions should address all levels of the cognitive domain: knowledge, comprehension, application, analysis, evaluation, and synthesis.

Role-Audience-Format-Topic (RAFT)

Description

This strategy asks students to creatively analyze and synthesize the information from a particular text or texts by taking on a particular role or perspective, defining the target audience, and choosing an appropriate written format to convey their understanding of the content topic. (N. Vandervanter, in Adler 1982; Santa, 1988)

Purpose

Use *before*, *during*, and *after* reading to:

- Enhance comprehension of main ideas, organization, and point of view
- Process information and reflect in unusual ways about concepts they have read
- Provide a creative, authentic way of communicating what was learned that can enhance students' engagement in writing or presentation tasks
- Encourage students to consider perspectives different than their own
- Help students communicate what they have learned using their preferred learning styles

Directions

1. Explain that a RAFT is a strategy that provides a way to creatively analyze and synthesize the information from a particular text or texts by taking on a particular **R**ole or perspective, defining the target **A**udience, and choosing an appropriate written **F**ormat to convey their understanding of the content **T**opic.
2. Model how to brainstorm and select the four components of a RAFT for students using a simple text or well-known concept/topic.

   Example of a teacher-created RAFT assignment for Global Warming and Pollution Unit

   Directions: Choose a role, audience, format, and topic that interests you from this list or create your own choices that will help you effectively summarize what you learned in this unit.

Role	Audience	Format	Topic
Environmental scientist	U.S. Congress	PowerPoint presentation	The need to immediately enforce pollution laws
CEO of a pollution-producing product	The corporation's lawyer in a class action suit by consumers to halt production	Data charts that show pollution has not caused temperature changes	Product manufacturing is not causing temperature change
Person whose parent died from a pollution-caused illness	Michael Moore	Interview for the movie *Sicko*	Why global warming is a personal crisis as well as a national and global crisis
Acid rain (personified as if it is a person)	Manufacturing managers at an annual conference	Protest song	The destruction of nature by mankind
Your idea	Your idea	Your idea	Your idea

3. Assign a text for students to read. Before reading, note the different perspectives in the text.
4. Brainstorm possible roles, audiences, formats, and topics related to the text that students may use to design their preferred RAFT. See the next page for some generic ideas for roles, audiences, and formats to stimulate thinking. Selected RAFT elements should be related directly to the text reading that lend themselves to summarizing what has been learned.
5. Students select the four components that most interest them to communicate their learning.

Extensions

- When first learning the RAFT strategy, have students work in cooperative groups.
- Have individual students or small groups brainstorm the four RAFT components rather than using the teacher-created list.
- Have students publish their RAFT writing/presentations to authentic audiences.

Cross Content Sample

Role-Audience-Format-Topic (RAFT)

English Language Arts

After reading a text selection demonstrating argument/persuasion, *before* writing

Have students enhance writing by applying different formats and points of view other than their own through use of the RAFT.

Example for RAFT choices for an essay against teenage drinking:

Role	Audience	Format	Topic
Child	School counselor	Dialogue	Brother's anger and violence when drunk
Homeless teenager	Homeless shelter director	Application essay for housing	How binge drinking caused eviction from parents' home
Parent	Boss	Letter of resignation	Resigning because need to be at home to monitor teenage drinker
Girlfriend	Boyfriend	Series of I-messages	Breaking up because of drinking parties

Mathematics

Before, *during*, and *after* reading geometry text chapter

Have students demonstrate their understanding of the mathematical concept by writing a RAFT-paragraph where the student takes on a real life Role, Audience, and Format related to the geometry topic.

Examples (adapted from Scholastic's *Writing to Prompts in the Trait-Based Classroom: Content Areas*):

Role	Audience	Format	Topic
Architect	Editor of Geometric Homes Journal	Advertise-ment	2 and 3 dimensional shapes
Student group	School Board	Cover letter & design for baseball field	Transformations and symmetry
Toy Designer	Children	Instructions for simple puzzles	Geometric shapes

Science

Before, *during*, and *after* reading various text, graphic, and visual materials about patterns of change in volcano and earthquake activity

Have students summarize their understanding of the patterns of change through creative RAFT writing or presentations, such as:

Role	Audience	Format	Topic
Research lab scientist	City planning board	Presentation on needed regulations	Probability of earthquake within 20 years
Doomsday religious fanatic	Protest at governor's office	Pamphlets and home-video	Recent volcano eruption in state is proof the end is near
Neighbors	Environ-mental Protection Agency	Petition for insurance coverage	Need for EPA to require insurance for earthquake damage

Social Studies

Before, *during*, and *after* reading about a different country in a World History class

Help students align foreign cultures to their own lives through creative writing using RAFTs:

Role	Audience	Format	Topic
Peace Corp volunteer	U.S. President	Letter and "White Paper"	Why U.S. should increase financial support to rural areas of this country
Teacher	Foreign exchange students	Lectures and photo-journalism presentations	Literature reflects cultural history and values
Children in the country	Alien from outer space	Discussion	Who they are & why they live like they do

Save the Last Word for Me

Description
A strategy that uses a collaborative format for the discussion of text in which students first record interesting quotes and why they find them interesting, and then share their thinking with their peers.

Purposes
- To support students' interaction with text
- To promote reading comprehension
- To clarify and deepen thinking about content

Directions
1. Divide students into groups of 3–5. Give each student 3–5 index cards.
2. Assign a text to read. Ask students to write quotations from the text they find interesting on one side of the card and why they find each quote interesting on the opposite side of the card.
3. After everyone is finished reading the selection and preparing their cards, the first person in each group shares one of his/her quotes but does not say why this interested him/her.
4. After everyone has taken about 1 minute to react/respond to the quote that was shared, the person who chose the quote wraps up the discussion with some final words about the quotation.
5. Discussion continues in this fashion with each person in the group taking 1–3 turns as time permits.

Extensions
- Have the group complete a group summary of the text that was read.
- Have the group debrief the session.
- Have each person select a quote to write about in a response journal.
- Ask each group to select the most important quote to share with the class with justification about why it was seen as significant.

Cross Content Sample
Save the Last Word for Me

English Language Arts	**Mathematics**
After reading a poetry unit Have students copy a stanza from a poem onto a card they find interesting with the reason on the reverse side, such as: Archibald MacLeish, *Eleven* "And summer mornings the mute child, rebellious, Stupid, hating the words, the meanings, hating The Think now, Think, the O but Think! Would leave On tiptoe."—Because it reminds me of how I feel about my mother, always wanting me to keep on studying when school gets out and I just want to be with my friends. Robert Frost, *Birches* "But swinging doesn't bend them down to stay As ice storms do."—It gives me advice on recovering from hurt by others.	*Before, during,* and *after* reading the calculus j-operator unit on imaginary number properties Have students align the math with their own interests by having them select quotes from the chapter that they connect with, such as: "The imaginary unit is denoted by the symbol j."—Because my name is Jay and I love science fiction and its imaginary inventions and machines. "It is impossible to square any real number and have the product equal a negative number. We must define a new number system if we wish to include square roots of negative numbers."—That always made me curious when we worked with square roots before now. "We need merely to multiply numerator and denominator by the conjugate of the denominator in order to perform this operation."—It's just so funny that the author keeps using adjectives like "merely" to show how easy calculus is and after ten weeks in this course, I wouldn't understand a word in this book without Ms. Smith's excellent instruction.
Science	**Social Studies**
Before, during, and *after* reading newspapers for current science issues Have students copy a scientific newspaper reference that they find interesting, such as: "Fluorescent filaments of the organisms, known as cyanobacteria, began forming in the river last week and by yesterday they streaked the Esplanade lagoons a psychedelic green."—I'm intrigued because a tiny bacteria caused a major transformation in a short period of time and I wonder how they will get the algae under control. "Carnoustie, Scotland—Rain was pelting. Sideways, as they say over here. It was a cold rain, too. And the wind? Surely, even the foundation of Glamis Castle had to be shaking."—I picked this as the only part of the paper I really like reading is the Sports section and I enjoy learning how weather affects sports, in this case golf.	*Before, during,* and *after* reading the U.S. Constitution, Articles, and Amendments Have students select quotes that they feel passionately about after reading, such as: "We the people of the United States, in order to form a more perfect Union, establish justice, insure domestic tranquility, provide for the common defense, promote the general welfare, and secure the blessings of liberty to ourselves and our posterity…"—Because it says it all and because I'm worried we're losing ground in achieving this vision. "The right of citizens of the United States, who are eighteen years of age or older, to vote shall not be denied or abridged by the United States or any state on account of age."—I'll be 18 next year and only at the very end in Amendment 26 is it reflected that youth's ideas are important.

Semantic Feature Analysis

Description

This analytical strategy helps students examine related concepts by recording distinctions between terms according to particular criteria across which the concepts can be compared. It is commonly used after a series of lessons or at the end of unit to help students consolidate understanding of essential concepts. (Anders and Bos, 1986)

Purpose

Use *before*, *during*, and *after* reading to:

- Build vocabulary by learning key vocabulary terms as concepts
- Develop a visual representation of the elements or characteristics of key concepts
- Develop the analytical skills of categorizing and comparing/contrasting
- Activate prior knowledge when used before reading
- Assess student understanding when used during or after reading

Directions

1. Select a reading that discusses many examples of a single concept, such as a chapter in a content-area textbook or a short story with many characters.
2. Select a category of concepts to be analyzed.
   Examples: types of government, mammals, geometric shapes, human diseases, characters in a play, ecosystems
3. Using the Semantic Feature Analysis template, list several terms within this concept down the rows in the left column. Across the top, list several key features (traits, properties, criteria, or characteristics) associated with any of the examples listed down the left side.

   Example of a Semantic Feature Analysis Template

Concept Terms	Key Features							

4. Model the process of completing the grid using a think-aloud to explain your thinking to the students as you determine whether to mark a term with a +, -, or ?

5. Have students read the text selection and then, based on their reading, code what key features are associated with which terms. This can be done individually or in pairs. Students should enter a plus sign (+) if the term typically possesses that feature, a minus sign (-) if the term does not typically include that feature, and a question mark (**?**) if, according to the reading, it is debatable or depends upon the specific context/situation whether the feature is applicable.
6. Compare individual or paired responses in small groups. Examine the grid and discuss similarities and differences between the concept terms. If two terms have the same patterns, discuss if there is a feature that differentiates them that could be added to the list.

Extensions

- Have students develop generalizations that can be tested against the grid.
- Divide the key feature columns into "before" and "after" so students can see how their thinking changes when the semantic feature analysis is done before and after reading.
- Challenge students to come up with different examples and additional key features.
- Have students create the concept terms and features on their own, based on the reading.

Cross Content Sample
Semantic Feature Analysis

English Language Arts

After reading narrative, epic, humorous, dramatic, ballad, free verse, and lyric forms of poetry

Help students understand the different literary devices used in different forms of poetry

	N	E	H	D	B	F	L
Stanzas							
Meter pattern							
Rhyme scheme							
Word repetition							
Accented syllables							
Refrain							
Alliteration							

Mathematics

During reading of trigonometry text chapter on triangles

Use Semantic Feature Analysis to help students understand how various triangles are used in trigonometry to problem-solve real situations:

	Equi-angular	Acute	Obtuse	Right
Distance between various points in the universe				
Projective force and velocity				
Electric circuits				
Architectural design				
Light refraction				

Science

Before, during, and *after* reading about systems of the body

Help students determine the interrelationships (or not) of human systems that impact health.

Systems codes:
S = Skeletal M = Muscular E = Endocrine
C = Cardiovascular D = Digestive U = Urinary
L = Lymphatic R = Respiratory N= Nervous

	S	M	E	C	D	U	L	R	N
Fitness									
Heart									
Cancer									
Diabetes									
Obesity									
Liver									
Alzheimer's									

Social Studies

Before, during, and *after* reading about economic systems in various countries and their impacts on the average citizen

Use Semantic Feature Analysis to predict and confirm the impact of elements of economic systems in various countries upon its people.

	US	Can	Mex	GB	Jap	Chi	Iraq
Employment							
Healthcare							
Retirement							
Recreation							
Education							
Agriculture							
Cultural arts							

Think-Aloud

Description

A modeling strategy designed to help students learn how to monitor comprehension, engage actively with text, and direct their thinking as they work through the process of understanding a text.

Purpose

Use *during* reading to:

- Engage students actively in thinking about how they are constructing meaning from text
- Enhance metacognitive awareness as students consider what they know and don't know
- Help students learn specific strategies for reading comprehension
- Enhance content-area reading comprehension

Directions

1. Consider what students need to know how to do during the reading task.
   - What meaning do you want them to construct from the content?
   - What reading comprehension strategy do you want them to learn and use?
2. Identify where you might pause during the passage to "think aloud" for your students.
   - Think about your own experiences related to the content/strategy.
   - Take what you know implicitly and make it explicit for students.
3. Mark the pauses with a sticky-note with a short notation of what you'll say.
4. Explicitly explain the think-aloud strategy before using it.
   - Tell students what the strategy is, why it helps, and when to use it.
   - Explain that you'll show them what's going on inside your head to construct meaning.
5. Read the text with the students as you do the think-aloud.
   - Have all students have a copy of the text to follow along *OR*
   - Put the text on an overhead projector so they can visually follow along.
6. Model the chosen thinking tasks by stopping to articulate what's going on in your head.
7. Give guidelines for students to practice doing a silent "think-aloud" using sticky-notes, such as:
   - Write down thoughts, questions, and connections as you read.
   - Have a "conversation" with the author. Write down what you would say to him/her.
   - Note your reading "moves"—where do you skim, have questions about words, or get confused.

Extensions

- Pair students to read a passage together and present think-alouds to each other, providing feedback to each other afterwards using a checklist or rubric.
- Use a think-aloud written protocol where students tape lined paper to each page so the text lines up with spaces to write notes. As students read, they write notes on the lined paper.
- Have students pair up and compare notations and complete some kind of independent response to a question or issue from the reading or from a collection of readings.

Cross Content Sample
Think-Aloud

English Language Arts *During* reading of excerpts from *The Odyssey*	**Mathematics** *During* reading of a chapter on linear equations
Help students learn how to construct meaning by explaining what happens in your own mind, such as: "When I was in high school, we read Homer's *The Odyssey* and I was lost from the start. I skipped the introduction which summarized the plot and had no idea about the literary devices that were used. So today I'll share what I'm thinking as I read as a model to help you get the most from this famous poem. First, as I open the text I see there's a chart called *People and Places* and some guidelines for reading an epic. So I read these parts for background information. Now I understand that long ago Odyssey didn't refer to a journey; Odysseus is the hero, also known as Ulysses. As I start reading the first section 'I am Laertes' son, Odysseus,' I see that the hero will tell his own story. But already I'm stuck on the next lines: 'Men hold me formidable for guile in peace and war'— what does that mean? I thought guile meant crafty deception. So I got a dictionary and found a second meaning, *cunning in attaining a goal*. That makes sense in war. Going on, I read that 'My home is on the peaked sea-mark of Ithaca'—I'm sure he didn't mean Ithaca, New York! Oh, there's a side note—it's an island off Greece. Reading on, he says the rocky isle was good for a boy's training, and I pictured him climbing the rocky areas and pushing himself to new physical limits, overcoming fear. I love to rock climb, too!"	Help students connect text, examples, and exercises to construct meaning by modeling the thinking, such as: "I know it's hard to read math texts, so I'm going to think aloud to show you how making connections as you read helps you understand things better. Turn to the chapter Systems of Linear Equations. Let's read the first part together and I'll explain how I figure it out by reading text, examples, and problems as a chunk, instead of trying to understand every sentence. First, there's a definition: *An equation is termed linear if in a given set of variables if each term contains only one variable, to the first power, or is a constant.* I think to myself, I like numbers but I don't easily grasp written explanations. So instead of trying to figure out this sentence yet, I'll continue reading for some examples. So I read Example A: *$4x + y = 8$ is linear in x and y, but $4xy + y = 8$ is not, due to the presence of xy.* Next, I compare this example to the definition. Now it makes more sense: there are two terms in the first equation, 4x and y, and both have only one variable. But the term 4xy has two variables. So I get that. But what does it mean in the definition, *to the first power*? All the numbers are to the first power. So I look ahead to the problems to see if there's a clue. Aha, problem C: *Is $5x^2 - t + 6 = 0$ a linear equation?* No, because it has a 2^{nd} power. Next, I need to figure out the meaning of *constant*; I'm not sure, so I go to the glossary to double-check my thinking. Yep, it's a number on its own and an opposite to the word variable."
Science *During* reading of a passage on ionic bonding	**Social Studies** *After* reading about the US federal era
Help students use figures and graphs to understand text passages with a think-aloud: Who can draw an ionic compound? When no hands went up, the teacher realized students overlooked the figures in the text during the homework reading. "I'll do a Think-Aloud to show you how to figure it out. So I'm you last night, reading along on the page about how combining sodium ions and chloride ions creates sodium chloride. So I try to picture that in my mind and what I see is like stirring eggs in a cake mix where the ingredients dissolve together. But is that the right image? I see that the text says see Figure 7-2. I quit reading the words and spend a few minutes analyzing the graphic of a cube-like structure with green and gray dots. What's the point, I think? Then I read the sidebar explaining the figure, and I see it asks: How many sodium ions surround each chloride ion? Hmm, I didn't even look for a pattern like that. That's cool—no matter which chloride ion I look at all over the 3D cube, there are always 3 sodium ions around it. And vice versa when chloride ions surround the sodium ions. So that's what they mean by balancing the electrical charges."	Help students skim and scan when studying for a test: Noting that students were complaining about too much homework, especially studying for tests, the teacher asked how many were re-reading the entire chapter. Almost all students were. To help them see how to skim and scan, she modeled the process with a think-aloud. "We just read Chapter 6 on the Federal Era. So I start my studying by going to the Table of Contents to check what I already know. Yes, I think I'm clear about Section 1, the new government at work: I understand the Bill of Rights, the judiciary and executive offices, but I don't recall Hamilton's fiscal program. So I look up that page and quickly read just the first sentence of every paragraph until I see in the fifth paragraph that his program included three recommendations. I jot these in my notes. Returning to the Table of Contents, I see that I'm confident about the next set of topics, but I recall the teacher emphasizing the Alien and Sedition Acts, so I'll brush up on those, too. And then I'll reread the summary at the end of the chapter—that will help me on the essay."

Triple-Entry Vocabulary Journal

Description

A strategy for learning new vocabulary that uses a three-column note taking format with columns for a word in context, definition in one's own words, and a picture, memory aid, or phrase related to the word.

Purpose

Use *before*, *during*, and *after* reading to:

- Help students understand key words when reading text that may limit comprehension if they are not known
- Provide a more interactive way to learn new vocabulary than "assign, define, and test"
- Provide a way for students to cognitively process new words, resulting in more retention
- Help students develop a customized glossary to the text that provides words in context, applicable definitions, and personalized memory/study aids

Directions

1. Determine the key words that students should understand while reading a selection.
2. Have students divide a notebook page into three columns. Label the columns:
   - Word in context
   - Definition in my own words
   - Picture, memory aid, phrase

   Example of the Triple-Entry Vocabulary Journal format

Word in Context	Definition in My Own Words	Picture, Memory Aid, Phrase

3. Model the strategy with several words.
   - In the first column, write down the sentence(s) within which the word is found, and underline or circle the word. Note the page on which you found the word.
   - Look up the word in the dictionary. Choose the meaning that fits the context of the word in your text. Write down a definition of the word in your own words in the second column.
   - In the third column, draw an image, jot a phrase, or create a memory device that will help you remember the word and its meaning.
4. Have students practice the strategy, sharing their definitions and memory aids.

Extensions

- Have students select words they don't know while reading. Assign a predetermined number of total words and/or how many words per page/section/chapter the student should select to enter in their triple-entry journal for each reading selection.
- Jigsaw the word list to be found in a particular section of text and distribute different words to different students in small groups. Students then look through the text for the words before reading

the selection to find the words, write them in the context of the sentence, and complete the strategy. Then the students in each group discuss and teach each other the words they will need to know for the text they are going to read.

- Have students compare and contrast each others' responses and discuss the words they found and did not know, supporting the development of word knowledge.

Cross Content Sample
Triple-Entry Vocabulary Journal

English Language Arts

During reading of *Romeo and Juliet*

Use the strategy to help students expand descriptive vocabulary and identify where dramatic conventions are used, such as:

Act III Words	Your Definition	Your Memory Picture/Phrase
banish		
beseech		
tidings		
vile		

Dramatic Convention	Your Definition	Your Memory Picture/Phrase
Concealment		
Soliloquy		

Mathematics

During reading of each unit in Geometry

Use the strategy throughout the course as a study guide to help students understand and visualize geometry terms, properties, and theorems, such as:

Angle Relationships	Your Definition	Your Memory Picture/Phrase
adjacent angles		
vertical angles		
linear pair		

Segment Relationships	Your Definition	Your Memory Picture/Phrase
Reflexive property		
Symmetric property		
Transitive property		

Science

During reading of chapter on the blood composition of the cardiovascular system

Help students compare types of blood composition

Blood composition type	Your Definition	Your Memory Picture/Phrase
Basophils		
Eosinophils		
Lymphocytes		
Monocytes		
Neutrophils		

Social Studies

During reading about the Federal Era in US History

Help students compare and contrast foreign affairs under the Washington and Adams administrations

Treaties and Acts	Your Definition	Your Memory Picture/Phrase
Jay's Treaty		
Pickney's Treaty		
Naturalization Act		
Alien Act		
Alient Enemies Act		
Sedition Act		

Two-Column Note Taking

Description

A two-column note taking strategy that can be used with text, lectures, or when viewing media presentations to help students organize their thinking about specific content. It is sometimes called a double-entry journal when used with fictional text or when the focus is on a student's personal response to the text instead of on "taking notes."

Purpose

Use *during* and *after* reading to:

- Create a user-friendly system to record important ideas, related details, and the relationships between concepts
- Help students remember important points and deepen their understanding of content
- Help students organize information and thoughts for thinking, writing, studying, or presenting

Directions

1. Students divide their paper into two columns with a 1:2 ratio.
2. Mark the columns with the appropriate headings.

Ideas for possible headings:

Fiction:

Column 1	Column 2
Passage	Response
Character	Decision
Quote	Importance

Nonfiction:

Column 1	Column 2
Keyword	Definition
Main idea	Detail
Cause	Effect
Concept	Example
Issue	Connection to own life

3. Model how to do the following: In the left-hand column, write a sentence, quote, or key word from the selection along with the page number. In the right-hand column, write the definition, give an example, and make a connection to your life.
4. Provide the specific words, quotes, etc., in the left-hand column that you want students to respond to while reading/listening.
5. Have students complete two-column notes independently, making sure the headings fit the reading/purpose for reading.

Extensions

- Students share their responses with others and solicit feedback.
- Students can use two-column notes as study guides, support for writing essays/summaries, or to take notes from films or lectures.

Cross Content Sample
Two-Column Note Taking

English Language Arts

After reading a collection of short stories from South Africa

Help students connect to very different life styles by responding to unique quotations.

Somehow Tenderness Survives

Quote and page number	**Connection (This reminds me of) Question (I wonder…) Confusion (I don't understand)**
"The cold went through my shirt and shorts." p. 9	I thought it was HOT in Africa!
"The white man stares until I lower my eyes. Well he said" p. 18	The white man demands respect from Les. But not from his own boys. Is it all about color?
"Hey Kliptop" "Bloody Kaffir" "Hottentot"	I wonder if Americans started using derogatory names towards African Americans because it started in Africa?

Mathematics

During reading of text information

Over time, help students take two column notes, showing them how to change the headers according to the specific content.

Examples:

Formula	Definition and/or Example

Vocabulary	Picture/Symbol

Function	Graph

Problem	Factoring Process

Science

After reading each chapter and completing the related lab or applied task

Have students keep a weekly journal to record their understanding of how science changes cause varied effects and reactions.

Weekly topic: _____

Example: Magnetism

Cause	Effect
Motion of electric charge	Produces a magnetic field
Interactions among adjacent iron atoms	Large clusters of the atoms line up with each other
A magnet is broken into two pieces	Each piece retains equally strong poles
Placing pieces of iron in strong magnetic fields or stroking a piece of iron with a magnet	A permanent magnet is made

Social Studies

During reading about the powers of the presidency in U.S. history

Have students take notes as they read about the powers of the presidency and explain presidential implementation of the power.

Power	Implementation of the power
The President is chief executive	The President appoints the heads of the departments who together make up the Cabinet. The President is responsible for the conduct of everyone in the executive branch.
The President is chief diplomat	The President has direct responsibility for the conduct of foreign affairs and shares this power with the Senate, which approves treaties and confirms the appointment of diplomats.
The President is commander in chief	The President controls all correspondence between the U.S. and foreign governments and requests a declaration of war when relations reach the point where war must be declared.

Word Sort

Description

Word sort is a classification strategy where the teacher provides lists of words that students cluster together in meaningful ways to evolve main ideas or determine conceptual relationships (closed sort). The students may also sort the words by characteristics and meanings and then label the categories (open sort). (Gillet and Kita, 1979)

Purpose

Use *before* and *after* reading to:

- Help students learn vocabulary by comparing, contrasting, and classifying words based on characteristics or meanings
- Help students recognize the relationships and differences between terms that are related to the same concept
- Develop students' ability to reason through analysis, classification, induction, and analogy
- Enhance students' interest in vocabulary development through a multi-sensory experience as they read, write, and manipulate words while sharing their thinking with others
- Develop divergent thinking when open sort is used

Directions

1. Have students copy vocabulary terms onto index cards, one word per card.
2. Have students sort the words into categories, either by providing the categories (closed sort) or having the students generate the categories (open sort).
3. Have students share the reasoning and evidence for the way the vocabulary is sorted.

Example:

Topic: Geometry—Solids, Circles, and Transformations

Words to Sort

pyramids	radius	translation
prism	diameter	lines of symmetry
reflection	surface area	isometric drawing
circumference	volume	cone
rotation	pi	rotational symmetry

Categories

polyhedrons	circles/cylinders	transformations

Source: Weizer, 2003. Used with permission.

Extensions

- Have students sort the words into a Venn diagram, then summarize their findings in a quick write.
- Differentiation suggestion: Match the complexity of the vocabulary terms used in the sorts to students' varied instructional levels.

Cross Content Sample
Word Sort

English Language Arts

Before, during, and *after* reading Anne Frank's *The Diary of a Young Girl*

Use the Word Sort to show how descriptive words support plot, theme, and characterization.

Categories: Illness, mood, personality trait

Words to sort:

dejected	fatalistic	melancholy
despondent	hypochondria	pensive
diphtheria	jocular	poignant
fanatic	malaria	superficial

Mathematics

Before, during, and *after* reading text information about circles, cylinders, polyhedrons, and transformations

Have students self-assess their understanding of various math terms through a Word Sort.

Categories: Circles/cylinders, polyhedrons, transformations

Words to sort:

circumference	pi	rotations
cone	prism	rotational symmetry
diameter	pyramids	surface area
isometric drawing	radius	translation
line of symmetry	reflection	volume

Science

Before reading chapters about chemistry, botany, and genetics in an Integrated Science course

Use the Word Sort to assess student understanding of the various science fields

Categories: Chemistry, botany, genetics

Words to sort:

abnormal	flagellum	polarity
adaptation	gene	sac
agglutination	infusion	solvent
annual	nutrient	synthetic
cyclical	photosynthesis	transpiration

Social Studies

Before, during, and *after* reading various articles, viewing period art, and listening to music from the Renaissance and the Reformation

Use the Word Sort as a beginning point for comparative analysis of the two periods

Categories: Renaissance, Reformation

Words to sort:

annul	indulgence
ghetto	patron
gravity	perspective
heliocentric	predestination
humanism	recant
theology	

Word Study

Description

The word study strategy is a way of analyzing the structure of unknown words to derive the meaning by decomposing words into prefixes, roots, and suffixes that are within words. It is often combined with contextual analysis of the sentence or passage.

Purpose

Use *before* or *during* reading to:

- Define unknown words
- Make words memorable through understanding the origins of the words

Directions

1. Identify words in an upcoming reading selection that can be analyzed by word parts.
2. Focus instruction on identifying the root word and seeing how the prefix and suffix function together with the root to create word meaning.
3. Have students practice covering the prefixes and suffixes to see the root words, then follow with practice in adding and removing prefixes and suffixes.
4. Once students are comfortable with the word parts strategy, teach them the specific word parts that relate to the content area and topic(s) of learning by providing practice with many words with the same prefix or suffix. This process of comparing words helps students more than memorizing an abstract definition.

Extensions

- Combine word study with instruction in context clues.
- Use vocabulary instruction strategies as appropriate to the specific words, such as word study for a simple word like chimneysweep or a concept definition map for more complex words like freedom.
- Focus instruction on multiple words by teaching a specific term along with other words that share the same root or the same prefix/suffix to show the links between words and to reinforce other words related to the same concept.

Cross Content Sample
Word Study

English Language Arts

During study of roots as a vocabulary development strategy

Have students partner together to brainstorm lists of words that contain frequently used roots.

Examples:

terr = land, earth
terrarium, subterranean, terrace, Mediterranean, territory

volv = to roll
revolver, involvement, revolve, evolve

mal(e) = bad
malaise, malady, malaria, malicious, malignant, maladjusted

Mathematics

After reading a chapter on measurements

Have students work in small groups to figure out the meanings of words with the Greek root *meter* or *metr*, which means measure.

Examples:

meter	diameter	metronome
geometry	barometer	metric
perimeter	symmetry	dioptometer
metrology	anemometer	metrical
thermometer	sphygmomanometer	

Science

During and *after* reading scientific text

Create a word wall for key roots related to the science course, adding words throughout the year that include the root.

Examples:

Centr (Greek) = center
centrifugal, centripetal, concentric, centralize

Derm (Greek) = skin
dermatitis, hypodermic, taxidermy, endoderm, dermis, pachyderm, ectoderm

Bio (Greek) = life
Biology, antibiotic, biosphere, biodegradable, biopsy, biochemical, bioluminescence, biometrics, amphibious

Social Studies

During various geography units

Review roots that are common in geography, such as geo, cosm, poli, terr, and popul. Have students keep a list of geography words with these roots as they read text chapters.

Example:

geo (the earth)	geography, geology, geocentric
cosm (universe, world)	cosmopolitan, cosmos
poli (city, state)	metropolis, cosmopolitan
terr (to roll)	territory, Mediterranean, subterranean
popul (people)	population, populous

Resources for Further Discussion

The following is a partial list of references that have influenced the thoughts and concepts expressed in this document. Professional book studies can become a prime opportunity to continue the discussion of how to best support adolescents as you endeavor to increase students' content knowledge, graduation rate, and readiness for post-secondary education required for the 21st century workplace.

ACT. (2006). *Reading between the lines: What the ACT reveals about college readiness in reading.* Iowa City: Author.

Alabama Reading Initiative. (2007). *Best practices in adolescent literacy, grades 4–12.* Montgomery, AL: Alabama State Department of Education.

Alvermann, D. E. (2001). *Effective literacy instruction for adolescents.* (Executive summary and paper). Chicago: National Reading Conference. Available from http://www.nrconline.org/publications/alverwhite2.pdf

Bacevich, A., & Salinger, T. (2006). *Lessons and recommendations from the Alabama reading initiative: Sustaining focus on secondary reading.* Washington, DC: American Institutes for Research.

Biancarosa, G., & Snow, C. E. (2004). *Reading next: A vision for action and research in middle and high school literacy.* Washington, DC: Alliance for Excellent Education (AEE).

Buehl, D. R. (2001). *Classroom strategies for interactive learning* (2nd ed.). Newark, DE: International Reading Association (IRA).

Dunn, R., & Dunn, K. (1993). *Teaching secondary students through their individual learning styles.* Boston: Allyn and Bacon.

Erlauer, B. (2003). *The brain compatible classroom: Using what we know about learning to improve teaching.* Alexandria, VA: Association for Supervision and Learning.

Fuentes, P. (1998). Reading comprehension in mathematics. *The Clearing House.* 72*(2*). 81–88.

Gardner, H. (1993). *Frames of mind: The theory of multiple intelligences.* New York: Basic Books.

Graham, S., & Perin, D. (2007). *Writing next: Effective strategies to improve writing of adolescents in middle and high schools.* [Report]. Washington, DC: AEE.

Greenleaf, C., & Schoenback, R. (2004). Building capacity for the responsive teaching of reading in the academic disciplines: Strategic inquiry designs for middle and high school teachers' professional development. In D. Strickland and M. L. Kamil (Eds.). *Improving reading achievement through professional development* (97–127). Norwood, MA: Christopher-Gordon Publishers.

Guthrie, J. T. (2001). Contexts for engagement and motivation in reading. *Reading Online.* Available from http://www.readingonline.org/articles/handbook/Guthrie/index.html.

Guthrie, J. T., & Knowles, K. T. (2001). Promoting reading motivation. In L. Verhoeven & C. Snow (Eds.). *Literacy and motivation: Reading engagement in individuals and groups* (173). Mahwah, NJ: Lawrence Erlbaum.

Guthrie, J. T., & Wigfield, A. (Eds.). (1997). *Reading engagement: Motivating readers through integrated instruction.* Newark, DE: IRA

Harvey, S., & Goudvis, A. (2000). *Strategies that work: Teaching comprehension to enhance understanding.* Portland, ME: Stenhouse.

Heller, R., & Greenleaf, C. (2007). *Literacy instruction in the content areas: Getting to the core of middle and high school improvement.* Washington, DC: AEE.

Irvin, J. L., Buehl, D., & Klemp, R. (2007). *Reading and the high school student: Strategies to enhance literacy* (2nd ed.). Boston: Allyn and Bacon.

Irvin, J., Meltzer, J., & Dukes, M. (2007). *Taking action on adolescent literacy: An implementation guide for school leaders.* Alexandria, VA: Association for Supervision and Curriculum Development (ASCD).

Kamil, M. (2003). *Adolescents and literacy: Reading for the 21st century.* Washington, DC: AEE.

Langer, J. (2002). *Effective literacy instruction: Building successful reading and writing programs.* Urbana, IL: National Council of Teachers of English.

Marzano, R. (1992). *A different kind of classroom: Teaching with dimensions of learning.* Alexandria, VA: ASCD.

Marzano, R. J. (2001). *Classroom instruction that works: Research-based strategies for increasing student achievement.* Alexandria, VA: ASCD.

Meltzer, J. (with Smith, N., & Clark, H). (2002). *Adolescent literacy resources: Linking research and practice.* Providence, RI: Northeast and Islands Regional Educational Laboratory at Brown University.

National Association of Secondary School Principals (NASSP). (2005). *Creating a culture of literacy: A guide for middle and high school principals.* Reston, VA: Author.

National Association State Boards of Education. (2005). *Reading at risk: The state response to the crisis in adolescent literacy.* Alexandria, VA: Author.

National Center for Educational Statistics. (2005). *National assessment of educational progress*. Washington, DC: US Department of Education.

National Council of Teachers of English. (2006). *NCTE principles of adolescent literacy.* Washington, DC: Author.

National Governors Association. (2005). *Reading to achieve: A governor's guide to adolescent literacy.* Washington, DC: Author.

National School Boards Association (2006). *The next chapter: A school board guide to improving adolescent literacy.* Alexandria, VA: Author.

Snow, C., Griffin, P., & Burns, S. (Eds.). (2005). *Knowledge to support the teaching of reading: Preparing teachers for a changing world.* San Francisco: Jossey-Bass.

Sousa, D. (2001). *How the brain learns: A classroom teacher's guide* (2nd ed.). Thousand Oaks, CA: Corwin Press.

Torgesen, J., et al. (2007). *Academic literacy instruction for adolescents: A guidance document from the Center on Instruction.* Portsmouth, NH: RMC Research Corporation, Center on Instruction.

Tovani, C. (2000). *I read it, but I don't get it: Comprehension strategies for adolescent readers.* Portland, ME: Stenhouse.

Vacca, R., & Vacca, J. (1998). *Content area reading: Learning across the curriculum.* New York: Longman.

Wade, S., & Moje, E. (2000). The role of text in classroom learning. In Kamil et al. (Eds.). *Handbook of reading research,* vol. II, (609–28). Mahwah, NJ: Lawrence Erlbaum Associates.

Wilhelm, J. D., Baker, T., & Dube, J. (2001). *Strategic reading: Guiding students to lifelong literacy 6–12.* Portsmouth, NH: Heinemann.

Wilhelm, J. D., & Smith, M. W. (2002). *"Reading don't fix no Chevys": Literacy in the lives of young men.* Portsmouth, NH: Heinemann.