Introduction

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_Literacy Across the Curriculum: Problem-Solving Strategies for the New York State Learning Standards_ is a collection of short, practical essays on teaching reading and writing in the context of New York state’s new learning standards and standards-based assessments. The essays were written by teachers in the Western New York Education Consortium, an association of educators who met regularly for five months to design reading and writing strategies for English language arts, social studies, and science. The essays focus on literacy strategies for middle and high school students and on many different types of standards-related academic tasks.

Our purpose in presenting these descriptions of teachers and writers at work is to share a variety of ways reading and writing strategies can help secondary students meet expectations inherent in the New York state learning standards and assessments. We have given each essay a descriptive subtitle, and we’ve also provided a table of contents and a comprehensive cross-reference index to the collection, so that readers looking for a particular application of literacy instruction -- teaching students to analyze information and draw conclusions, for example -- can find the relevant essays quickly. Each of the essays also has more general applications, however, and we recommend them all to teachers seriously concerned with helping students meet the challenges of New York’s new standards and assessments. The emphasis throughout the collection is on problem-solving strategies for helping students to think clearly about the subject matter being studied and to use reading and writing as instruments of learning in English, social studies, and science. This emphasis on problem-solving strategies is what makes the essays useful across the curriculum for mastering the new standards and assessments.
The Western New York Education Consortium

The Western New York Education Consortium consists of educators from four school districts and the University at Buffalo. The Iroquois Central School District is the lead district in the Consortium, and the other participating districts are the Depew Union Free School district, Lockport City School District, and Springville-Griffith Institute School District.

With support from the New York State Education Department’s Targeted Staff Development Program and from each of the participating districts, the Consortium met regularly between February and June, 2000, to design and develop reading and writing strategies for secondary English, social studies, and science. Early on, the Consortium adopted a cognitive-strategies approach to literacy instruction and studied the research on cognition and metacognition as a foundation for later developing problem-solving strategies for literacy instruction English, social studies, and science. The Consortium also studied the uses of technology for teaching and learning across the secondary disciplines. Through a series of ten professional development workshops with the forty participating teachers, ten from each district, the Consortium applied research on cognitive strategies and technology to the design of specific strategies to help students solve problems they encounter while reading and writing for English, social studies, and science. The Consortium also studied the intellectual demands of the new assessments and, again, looked for ways to help students with problems they encounter with reading and writing, this time in the context of thinking critically and reflectively for the task of responding to the tests.

The result of all this work are the strategies presented in this collection. All of the strategies have been designed, drafted, discussed, analyzed, and revised by “Critical Friends” teams through peer review conferences conducted on an ongoing basis by teams of teachers across districts in the Consortium. Even though time was short, most of the strategies were also tried out in the classrooms of participating teachers. These trials were informal and descriptive in nature, rather than controlled and clinical, and the authors of the chapters in the collection realize that many of the strategies are first attempts at solving problems students encounter and can benefit from additional fine-tuning. The chapter authors welcome feedback and suggestions from readers who use the strategies in their teaching, and for this reason we have provided contact information for member of the Consortium at the end of the collection.

Problem-Solving Strategies for Reading and Writing

Like most researchers in cognitive processes in writing, teachers in this volume use a problem-solving metaphor for thinking. We think of literacy
instruction as helping students to identify and solve problems they encounter while reading and writing, and we think of this problem solving in terms of mental procedures which are characterized by certain ways of thinking that help make reading and writing processes successful and efficient. These successful and efficient ways of thinking about solving problems are called strategies, and the essays all describe one or more of the strategies we’ve identified as key components of the thinking students may use to solve problems encountered while reading and writing.

Of course, learning to read and write also includes the learning of skills and conventions, but if we only teach those and don’t show students how to solve problems they encounter while reading and writing, it’s possible that for some students we have only taught a lot of information about literacy in our subject areas. That possibility is especially likely for students who have the most difficulty with reading and writing, the ones who constantly struggle with understanding and making inferences from their reading and with generating content and organizing it for presentation in their writing. Because mental control procedures, or strategies, are crucial to reading and writing processes, especially for students who have more than average difficulty with literacy, we believe we should teach these procedures. The literature on strategy instruction describes these control procedures as cognitive and metacognitive strategies readers and writers use to guide their work during the acts of reading and writing. In our day-to-day work we simply call them learning strategies, reading strategies, or writing strategies.

Reading and writing are like teaching in that they involve constant monitoring and adjusting of what one is doing to help insure that goals are established and achieved. Just as experienced teachers have repertoires of teaching strategies to monitor and control lessons, experienced readers and writers have strategies to monitor and control the production of text. And just as beginning teachers can be taught to use effective teaching strategies, struggling writers can be taught to use effective writing strategies.

Constructing Strategies for Reading and Writing

If we think of the mind as analogous to a computer, then cognitive strategies are the programs that run on the computer to accomplish its work. Of course, the mind is infinitely more complex than even the most powerful computer because we not only have procedures for controlling problem solving, but we can also invent new procedures and problems. We not only control problem solving (cognition) and control the controls (metacognition), but we construct the problems and controls in the first place.
This is where good teaching comes into play. The teachers in this collection believe that we can’t just give students reading and writing strategies directly. Newly encountered strategies must be at least partly imagined or invented, that is, constructed on the student’s own terms and in accordance with the student’s own reading and writing processes. New strategies can’t be handed over and put on like a suit of clothes. Strategies are best learned as they are co-constructed by participants engaged in meaningful reading and writing activities. We all get our literacy strategies from interacting with texts in literate communities, and we don’t just adopt them wholesale. We create them for ourselves. Some strategies are acquired intuitively from experience with reading and writing and social interaction, and others are learned more directly from instruction and practice, but we always make a personal, experiential, creative investment in arriving at new cognitive strategies.

Strategies don’t solve problems; people do. Teachers can model strategies to show students the cognitive tools readers and writers use. Students themselves then must go on to use the tools. Students must interact meaningfully with texts and solve problems as they are encountered to create an understanding of uses of the tools for themselves.

Steps and Thinksheets

Cognitive tools, thus, are not like material tools such as hammers and wrenches, firm and fixed and always the same for everyone. Cognitive tools are created, shaped, and fine-tuned in the process of using them. Students don’t have to re-invent every part of the strategy wheel (that’s where teachers come in -- we can give them a prototype wheel to start with), but they do have to make the wheel fit their background knowledge, knowledge of the topic, and knowledge of reading and writing processes. Strategies are malleable and learned through practice and co-construction. We teach reading and writing strategies by starting with an exemplary strategy, which we model, and then writers construct their own strategy out of our recommended one as they adapt and use the strategy we modeled. Finally, they refine the strategy with practice so it becomes more automatic and ingrained and thus even more useful. This four-step process of learning literacy strategies frames each of the essays in this collection.

In outline form, these are the four steps:

1. Identify a strategy worth teaching
2. Model the strategy for students
3. Scaffold learning of the strategy by helping individual students
4. Provide additional practice with the strategy
In addition to these four main steps in teaching literacy strategies, most of the essays in the collection also include reproducible thinksheets. Thinksheets are pages we give to students to guide their thinking. Thinksheets present problem-solving assistance by providing tasks, spaces, and guidelines to support the thinking students are doing in a given reading or writing task. A thinksheet is the opposite of a worksheet; where worksheets have student rather mindlessly tell what they know by filling in blanks, thinksheets have them transform what they know by thinking about knowledge and re-casting it in new, goal-directed ways to solve the problem at hand.

This difference between telling what one knows and transforming what one knows is at the heart of the strategies presented in the collection. We take pride in not presenting hollow formulas and rigid patterns for students to simply fill in without serious and hard grappling with the subject at hand. By changing the purpose of reading and writing from telling knowledge to transforming knowledge, we place the spotlight on critical and reflective thinking, on self-regulated learning, and on constructing knowledge for oneself. Certainly this is the purpose of New York's learning standards and assessments. And when all is said and done, it is also the purpose of good teaching.

**A Guide to the Chapters**

As we mentioned above, we have provided a table of contents, descriptive subtitles, and a cross-reference index to help readers find the chapters in the collection which are most relevant to their work. In this final section we provide another guide to the content of the chapters by adhering to the more traditional purpose of an introduction and saying a little about each chapter.

I. English Language Arts

Chapter 1 describes strategy for benefiting from multiple readings of texts. The strategy is exemplified through literature study, but it would work in any content area where multiple readings of key passages from textbooks can be useful.

Chapter 2 presents a strategy for enhancing the interpretation of literature by extracting key words and an overall subject from literary works. The strategy also teaches the visual organization of responses to literature.
Chapter 3 teaches a strategy for distinguishing between more and less important information in the study of literature. It also teaches students to organize their responses according to main ideas and supporting evidence.

Chapter 4 presents another approach to helping students recognize key ideas and supporting evidence, this time with an emphasis on middle school and expository prose.

Chapter 5 describes a strategy for active reading. Students read with their pencils in hand and record information and examples in the thinksheet provided with the chapter.

Chapters 6 and 7 take us back to literary response, this time with a variety of strategies for developing controlling ideas and understanding literary terms and techniques.

Chapter 8 presents a systematic approach to help students make sense of the 3 x 5 card as strategy for research recordkeeping.

Chapter 9 describes a strategy for enhancing reading comprehension. This strategy also helps with understanding key literary terms and with responding to literature.

Chapter 10 presents a strategy for coaching students in informative writing. The thinksheets in this case are a coaching rubric and helpful checklist to support learning of the basic elements of informative writing.

Chapter 11 focuses on a strategy for understanding unfamiliar texts. It uses color-coded cards and presents the example of studying Shakespeare to clarify the strategy.

II. Social Studies

Chapter 12 presents a T-outline, or double-entry format, for preparing to write responses to document-based questions.
Chapter 13 describes a strategy for enhancing reading comprehension and evaluating key ideas in expository writing. The strategy also guides students toward analytical writing in social studies.

Chapter 14 focuses on strategies for making sense of information presented in visual formats: charts, tables, diagrams, graphs, pictures, photos, political cartoons, maps, and more.

Chapter 15 presents a strategy for understanding word meanings in terms of both connotation denotation. The thinksheet consists of a sequential, graphic approach to connecting connotations and denotations.

Chapters 16 and 17 take us back to the document-based question, this time with strategies for planning and writing the essay incorporating outside information and integrating it with information provided within the documents. Both chapters also deal with formats for producing the document-based essay.

Chapter 18 focuses on reading and understanding test questions and on generating the information appropriate to shaping a response.

Chapter 19 provides a strategy for considering both sides of current events news stories. The thinksheet helps students to classify information and to reach an independent judgment of the merits of opposing arguments.

Chapter 20 identifies strategies for taking notes, for organizing the notes, and for writing an essay based on notes on data. Thinksheets this time provide a variety of ways to consider where arguments are similar and different.

III. Science

Chapter 21 takes a systematic guide for writing in social studies and applies it to science. The strategy helps students classify and analyze information and then organize it for writing.

Chapter 22 presents a strategy for scaffolding the research process in science classrooms. The chapter includes thinksheets and samples of a multiple-drafts student report.
Chapter 23 bridges the gap between reading and writing by using a strategy for focusing student attention on key comparisons between reading and seagoing voyages. The thinksheets are composed of appropriate shipping documents that encourage students to build on the comparisons.

Chapter 24 applies the Venn-diagram strategy to science writing to compare two concepts, topics or procedures.

Chapter 25 presents a strategy for combining problem identification with problem solving and then moves on to a strategy for writing multi-source conclusions to laboratory experiments.

Chapter 26 focuses on a strategy for making sense of Regents science questions. The thinksheet presents steps for systematically working through test questions.

Chapter 27 presents a strategy for getting form visual information to narrative writing. The visuals are pictures and diagrams, and the strategy helps students to find the science focus in the visuals and decipher its meaning in terms of text.

Chapter 28 also deals with information presented visually to students as a basis for science writing.