# Reading, Writing and Language as Tools for Learning
# Rethinking the School Curriculum
# An Historical Perspective

P. David Pearson
UC Berkeley

# Some preliminaries

- I truly believe that the future of reading instruction (maybe writing and maybe academic language instruction) lies in our capacity to decenter
  - To think of reading, writing, and academic language acquisition as more like learning and less like subject matter
  - As tools for acquiring knowledge and skill in other areas
- They are better off as a means to an end than as an end unto itself
- Tools not goals

# Our current view of curriculum

# A model we like: Tools by Disciplines

Academic Disciplines.....

Language Tools

| | Science | Social Studies | Mathe-matics | ***Literature*** |
|---|---|---|---|---|
| Reading | | | | |
| Writing | | | | |
| Language | | | | |

# Early: Tools dominate

## Academic Disciplines.....

Language Tools

| | Science | Social Studies | Mathe-matics | ***Literature*** |
|---|---|---|---|---|
| **Reading** | | | | |
| **Writing** | | | | |
| **Language** | | | | |

# Later: Disciplines dominate

Academic Disciplines.....

Language Tools

| | Science | Social Studies | Mathematics | *Literature* |
|---|---|---|---|---|
| Reading | | | | |
| Writing | | | | |
| Language | | | | |

# Not really a new idea

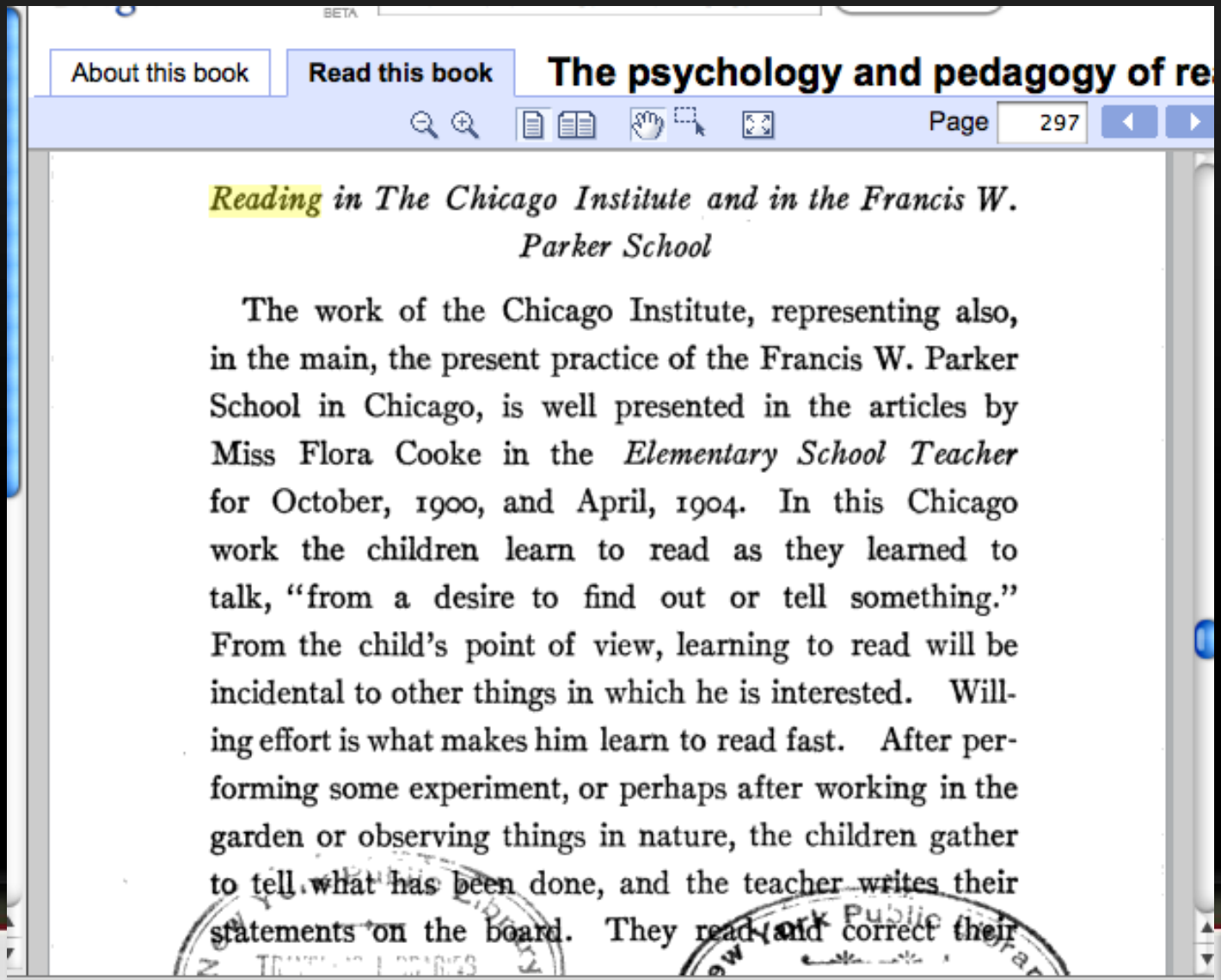
- The basals of the late 19th Century
- Early 20th Century language experience
- The British infant school movement
- Whole Language
- Reading and writing across the curriculum
- Project Based Learning
- Interdisciplinary and multidisciplinary studies

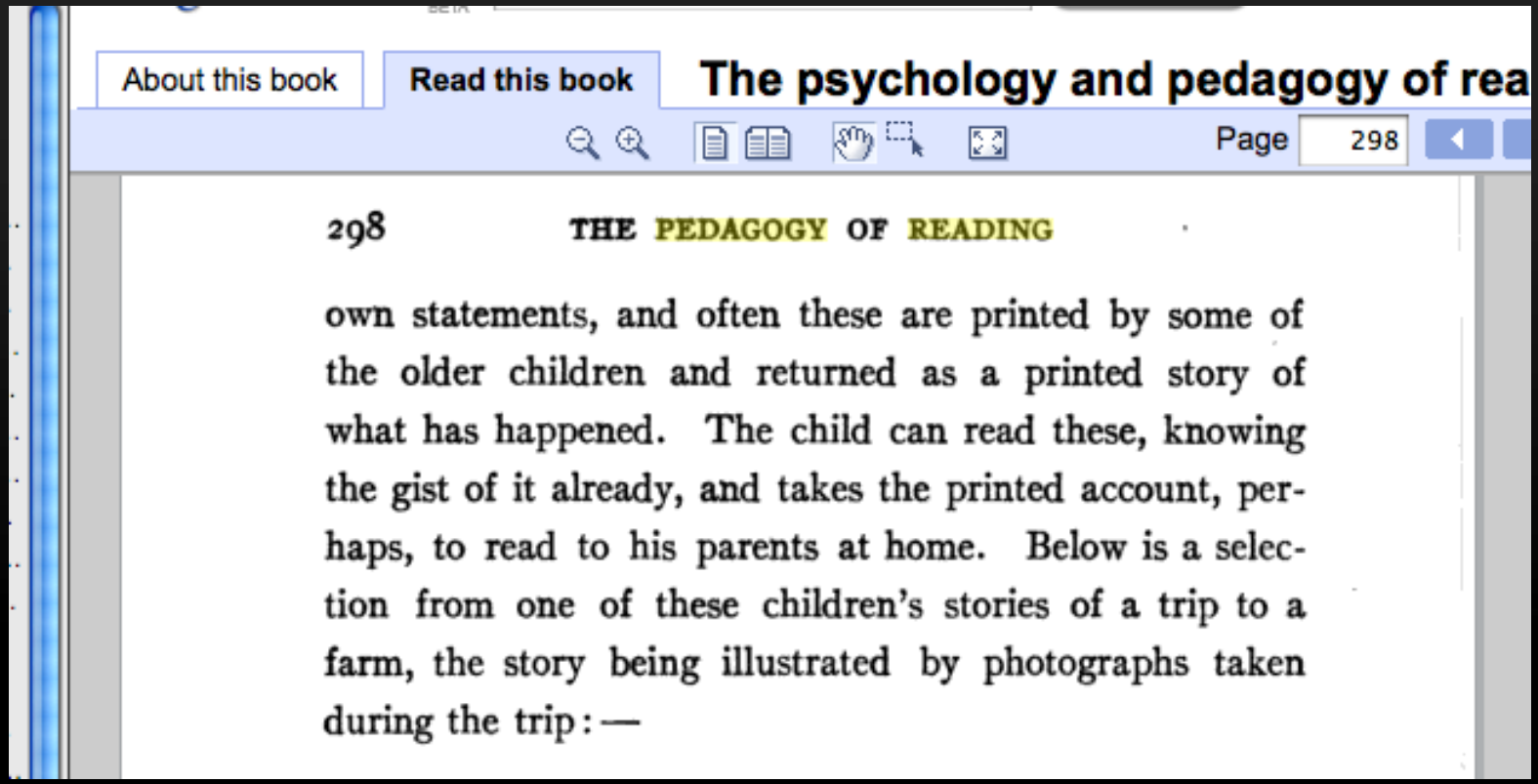
# Wilson Readers 1860s

pages of expository and informational material, 24 pages of poetry, and 1 page of fable.

**Willson's Readers.** We may now glance at one of the exceptional series of readers of this period, just for the purpose of noting the fact that all readers did not run in the same channels. The School and Family series by Marcius Willson, published in New York in 1860, was distinctive in that it specialized in scientific content. The series contained a variety of types of literature, such as incident, anecdote, and poetry, but all these were subordinated to the author's intent to convey scientific information. The following lesson headings are found in Number Five of the series: elocution, reptiles, physiology and health, botany, fishes, architecture, natural philosophy, physical geography, chemistry, geology, general history, and geometry.

# Language Experience at the Chicago Francis Parker Lab School in 1908






Retrieved from Google Books

## READING LESSON ON THE FARM AT THORNTON

October 2, 1897, we went to visit a farm.

It was a beautiful day.

There was a deep blue sky above us, with not a cloud in it, and cool, fresh air around us.

We had bright sunshine all day long.

"The nicest day of all the year!" said Fritz.

The farm we visited is 15 miles from our school.

It is on Halsted Street.

We might have gone all the way in wagons, but that was too slow for us.

It only took us 42 minutes to go on the train.

Then we were only one mile and a half from the farm.

Big hay-wagons were waiting for us at the station.

Oh, what fun we had going to the farm!

We passed a big limestone quarry.

We wanted to see it, but we could not stop for that.

We passed some beautiful oak woods.

We wanted to gather leaves, but we could not stop for that.

We passed a great yard full of horses and colts.

The story goes on relating the adventures of the day, with photographs of the barn, stacks, cattle, pigs; of the chil-

dren themselves in the wood, of chopping down trees, of stacked wheat, etc. Along with this story of their own trip, the teacher and children read printed accounts of other farm visits made by earlier grades, and compare their experiences. The knowledge that other children are to read their own account gives a stimulus to good expression. The children draw or suggest illustrations for making the story clearer to readers. The motive in reading the lesson when printed is to live over the day's experiences again, to see if anything important has been left out, and to see if the account is such as will interest mamma or absent children.

The child's reading vocabulary is allowed to grow with his experience. As a new word is used in a discussion about garden soils, the word is written on the board and is pointed to, but not spoken, when used later. Its visual form is thus impressed by use. The child may make a little index dictionary of these new words. Diacritical

Thus reading and writing and drawing are learned in the service of what the children are doing as a social community. Reading is not made an end in itself, and does not gather the mannerisms and the débris of technique that accompany reading done for its own sake and by "Reading's" own special methods.

In a recent letter concerning this work in reading, Miss Cooke, now of the Francis W. Parker School, says: "I can vouch, after nearly twenty years' experience, that the method is a success when carried out by a thoughtful teacher. . . . I think the third grade children are good testimony on the subject, as they read, with ease, fluency, and pleasure, almost anything one can put into their hands."

# British Infant School:

- Experience→Pictures→Story
- Joint writing
  - Overwriting
  - Underwrting
- Word Books
- Lots of books

Peter S. Pierro,
http://searchwarp.com/swa291887.htm

# The Open School Movement

Welcome to M

http://marcy.mpls.k12.mn.us/

Started Latest Headlines AA BA Chase GMailpdp UAL SWA UCB IRA

Welcome to Marcy! | Mozilla Firefox Start Page


Print View

MPS home

Search

- Home
- About Our School
- Calendar
- Councils
- Meet the Staff /staff webpages
- For Parents
- For Staff
- For Students
- Middle School
- Marcy Arts Partne
- Marcy School Library Catalog
- Tour Info
- Volunteers
- Marcy Family Calendar
- What is an Open School?
- Project Success
- Sitemap

## Welcome to Marcy!

415 4th Avenue SE Minneapolis, MN 55414 Tele: (612) 668-1020 Fax: (612) 668-1030 What is an Open School? Welcome to Marcy Open School! Marcy Open School offers a learning climate where the student is the center, emphasizing academic achievement as well as personal development that promotes lifelong learning and individual goal setting. Learning takes place in multi-grade and looping classrooms where many activities occur at the same time, using an integrated curriculum in which students are taught to take responsibility for themselves and their learning. Teachers function as guides and facilitators of learning. Marcy strongly promotes learning through the arts by involving students in arts activities with local artists through the Marcy Arts Partnership; and emphasizes a commitment

## Calendar

| < | May 09 | | | | | > |
|---|---|---|---|---|---|---|
| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
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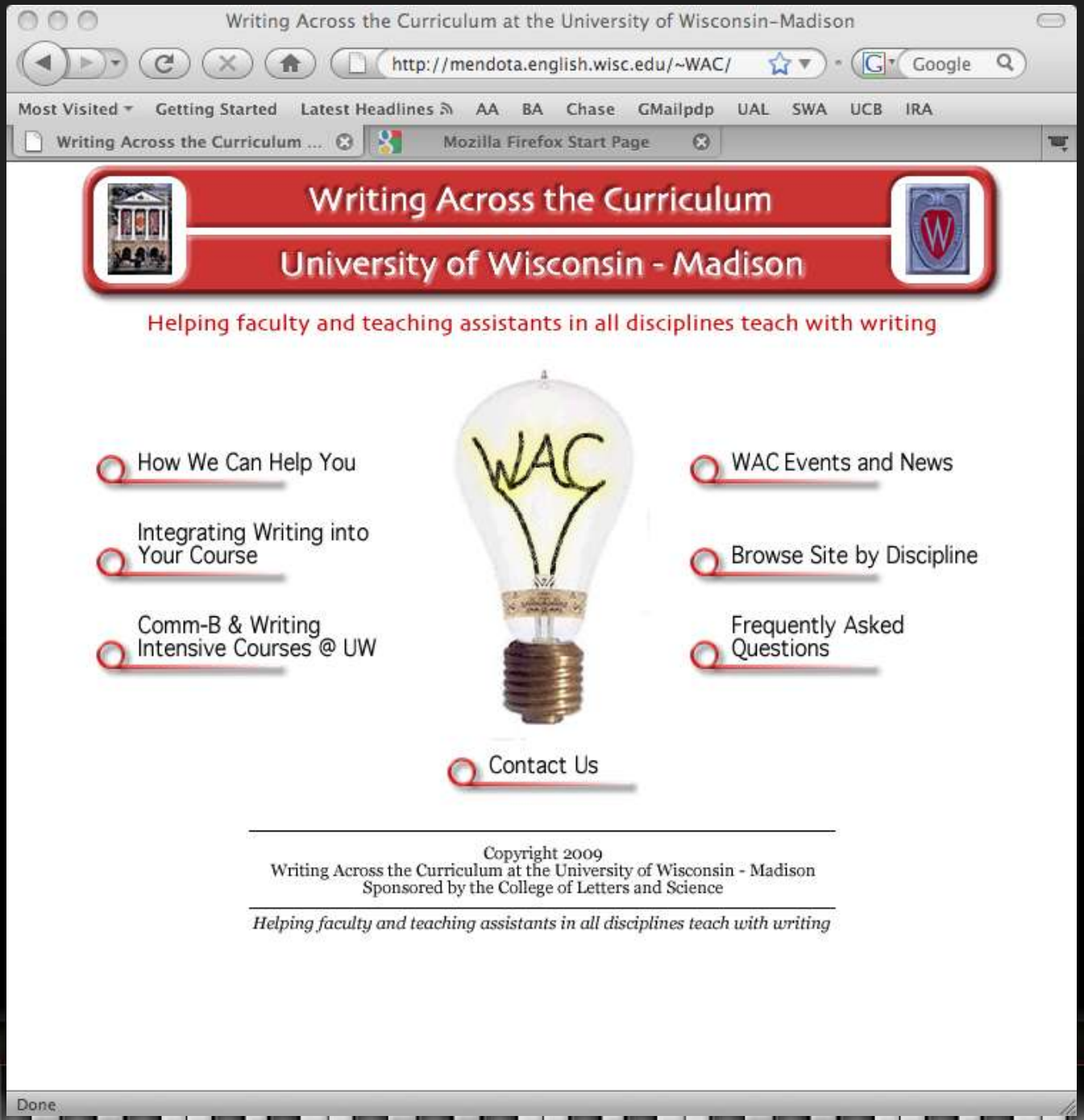
| 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | | | | | | |

Click on the bolded dates to see the events for that day.




**You can find Writing Across the Curriculum on almost any college website**

# The WAC Clearinghouse

*supporting scholarly exchange about communication across the curriculum*



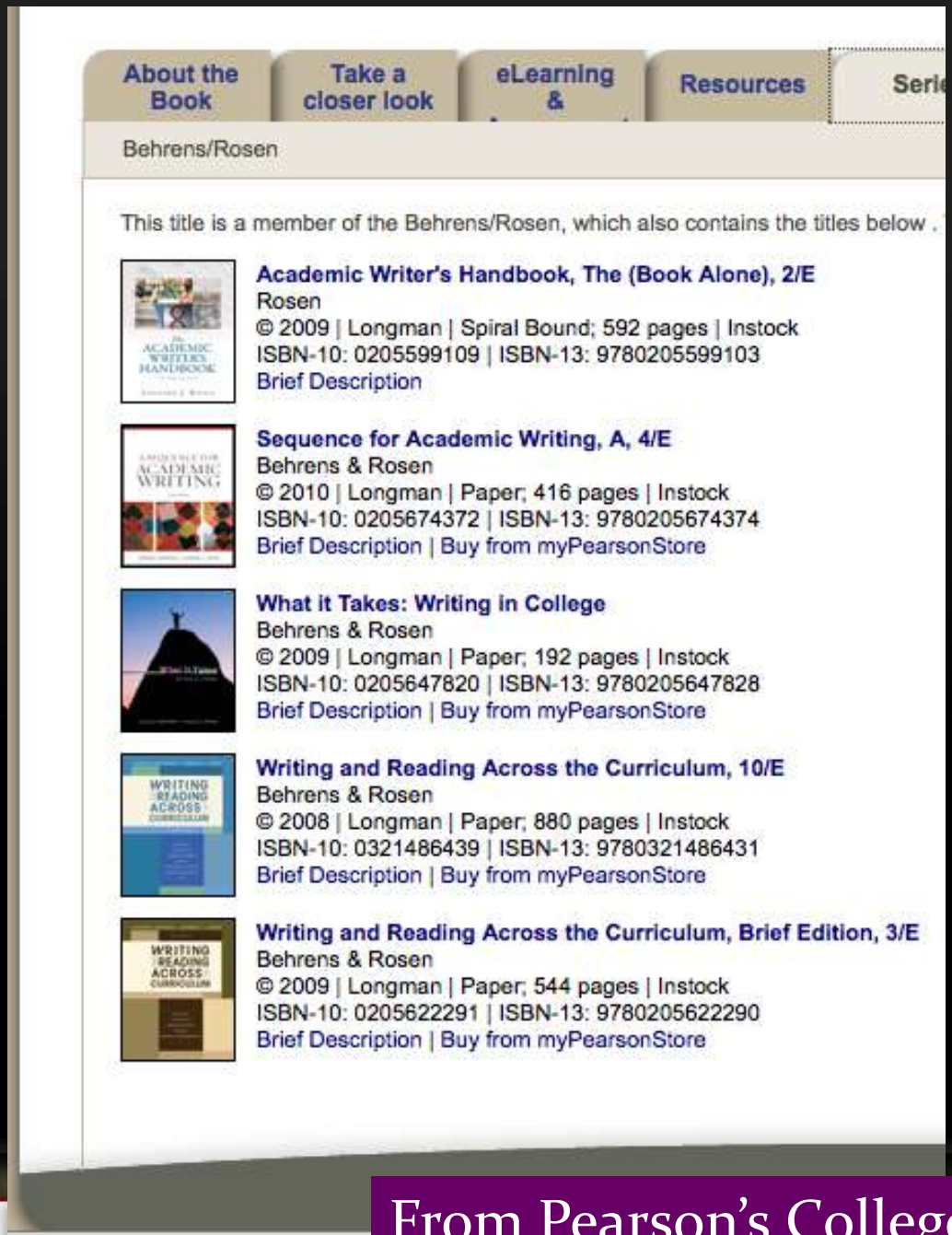
**Contents**



## An Introduction to Writing Across the Curriculum

This guide offers information about WAC – writing across the curriculum. If you're reading this for the first time, please view our tips on using the guide. To learn more about WAC, choose any of the items below:

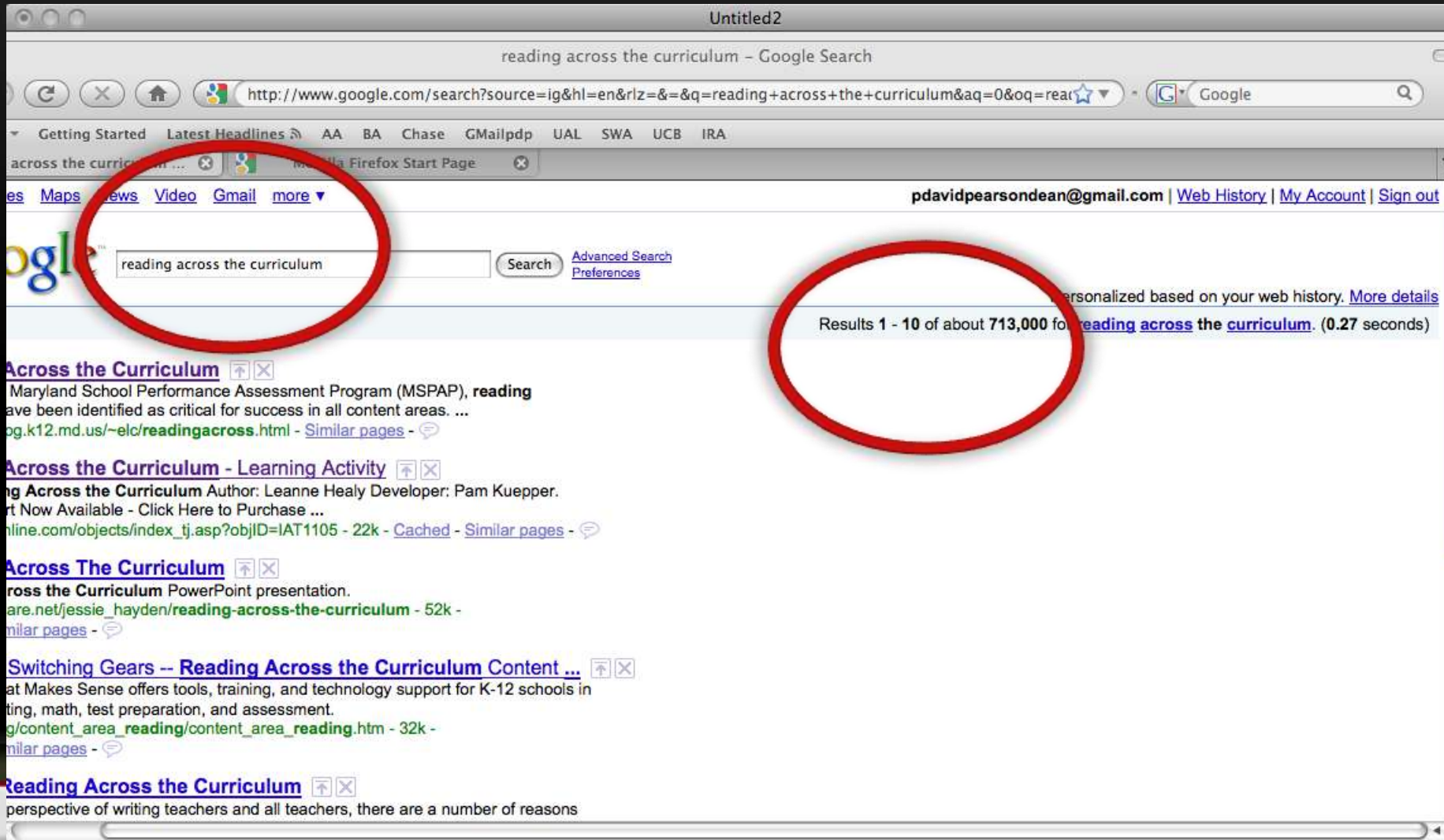
- Why include writing in my courses?
- What kinds of writing can I include?
- What is writing to learn?
- What is writing in the disciplines?
- Do I have to be an expert in grammar?
- Do writing and peer review take up too much class time?
- How can I avoid getting lousy student papers?
- What makes a good writing assignment?
- How can I get the most out of peer-review?
- How can I handle papers?
- Why consider collaborative writing assignments?
- What writing resources are available for my students?
- What teaching resources are available?
- Other Online Resources on the WAC Clearinghouse

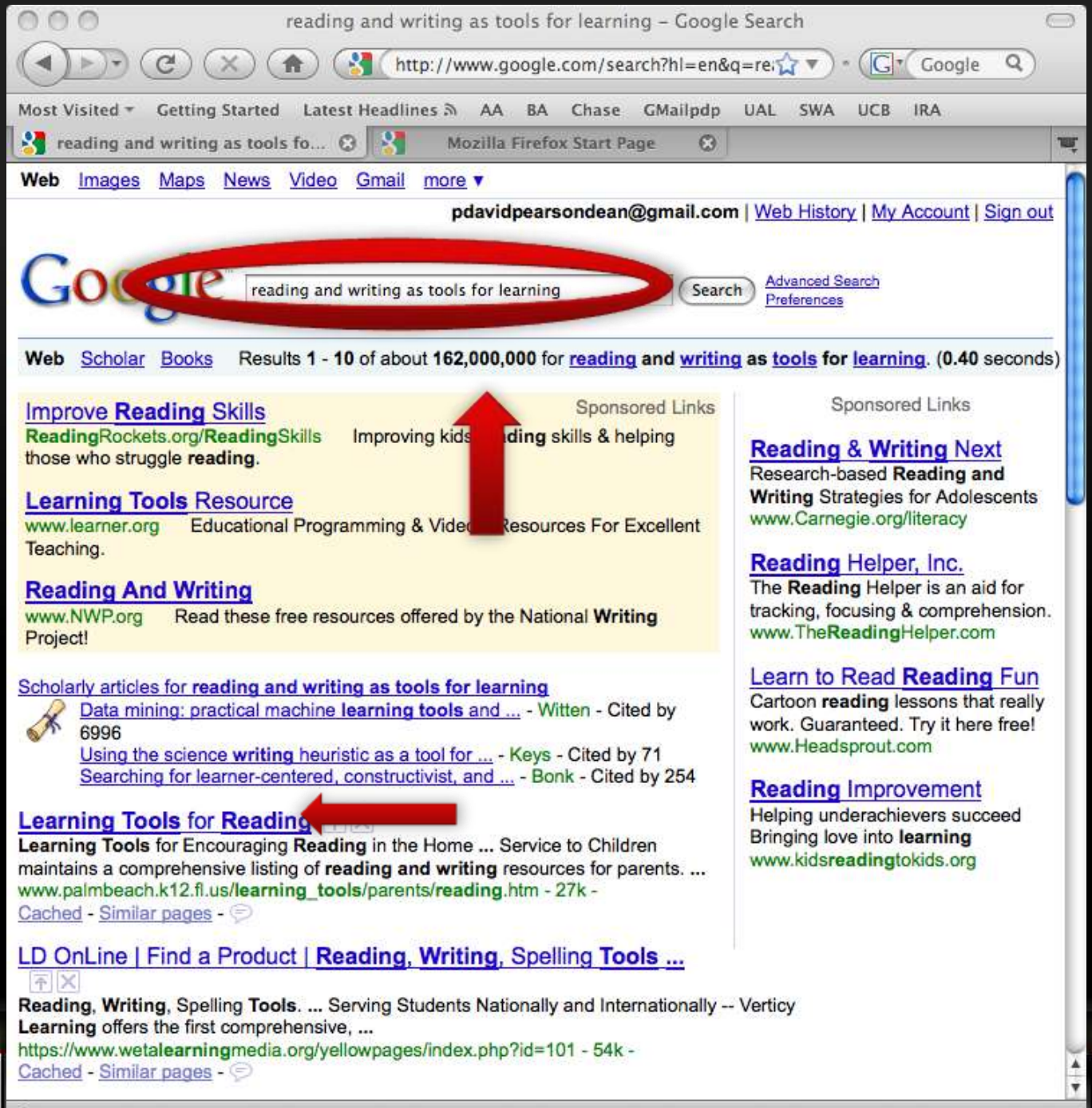



**At the college level, reading and writing across the curriculum is alive and well.**

From Pearson's College Division website

# Google Search of Reading Across the Curriculum




reading and writing as tools for learning – Google Search
http://www.google.com/search?hl=en&q=re
Google
Most Visited
Getting Started
Latest Headlines
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BA
Chase
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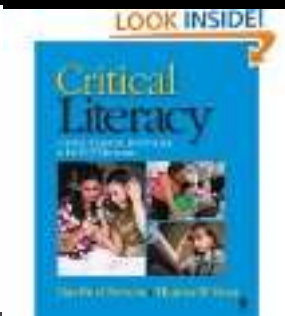
Advanced Search
Preferences
Web
Scholar
Books
Results 1 - 10 of about 162,000,000 for reading and writing as tools for learning. (0.40 seconds)
Sponsored Links
Improve Reading Skills
ReadingRockets.org/ReadingSkills
Improving kids ding skills & helping those who struggle reading.
Learning Tools Resource
www.learner.org
Educational Programming & Vide Resources For Excellent Teaching.
Reading And Writing
www.NWP.org
Read these free resources offered by the National Writing Project!
Scholarly articles for reading and writing as tools for learning
Data mining: practical machine learning tools and ... - Witten - Cited by 6996
Using the science writing heuristic as a tool for ... - Keys - Cited by 71
Searching for learner-centered, constructivist, and ... - Bonk - Cited by 254
Learning Tools for Reading
Learning Tools for Encouraging Reading in the Home ... Service to Children maintains a comprehensive listing of reading and writing resources for parents. ...
www.palmbeach.k12.fl.us/learning_tools/parents/reading.htm - 27k -
Cached - Similar pages -
LD OnLine | Find a Product | Reading, Writing, Spelling Tools ...
Reading, Writing, Spelling Tools. ... Serving Students Nationally and Internationally -- Verticy Learning offers the first comprehensive, ...
https://www.wetalearningmedia.org/yellowpages/index.php?id=101 - 54k -
Cached - Similar pages -
Sponsored Links
Reading & Writing Next
Research-based Reading and Writing Strategies for Adolescents
www.Carnegie.org/literacy
Reading Helper, Inc.
The Reading Helper is an aid for tracking, focusing & comprehension.
www.TheReadingHelper.com
Learn to Read Reading Fun
Cartoon reading lessons that really work. Guaranteed. Try it here free!
www.Headsprout.com
Reading Improvement
Helping underachievers succeed
Bringing love into learning
www.kidsreadingtokids.org

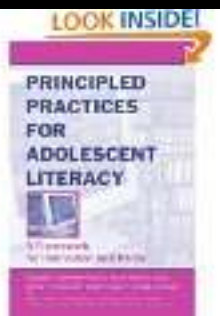
# Literacy as a tool for learning

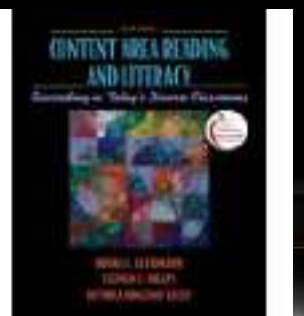
- Teaching through Text Message; Cell Phones Emerge as Learning Tool

# Secondary Content Area Literacy

- Teaching in Content Areas with Reading, Writing, and Reasoning: Reading, Writing and Reasoning By Harold L. Herber, Joan Nelson-Herber
- Improving Reading in Every Class: A Sourcebook for Teachers by H. Alan Robinson Ellen Lamar Thomas

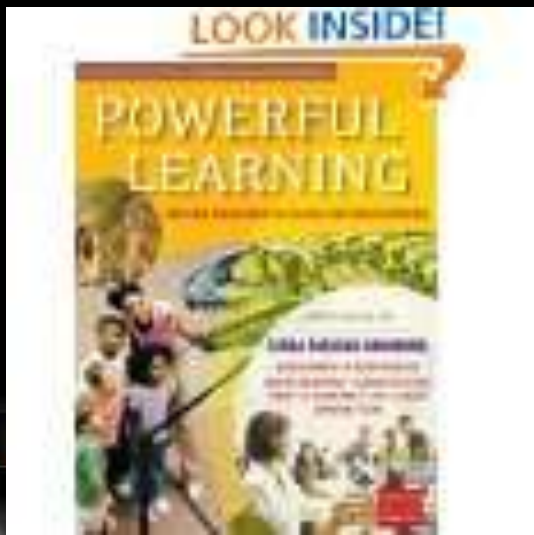






# Problem based learning

- Problems don't respect disciplines
- Problems nurture integrated use of tools
- Problems lead to interdisciplinary and multidisciplinary research centers
- Occasionally they lead to new fields
  - Bioengineering
  - Biochemistry
- Sometimes even even smaller disciplinary domains
  - UC Berkeley: from one to many biology departments
    - Molecular and Cell Biology
    - Integrative Biology



# That's my version of the history

- Now let's look at more recent attempts to embed literacy and language into science curriculum.

# Some more preliminaries

- Science educators are right to be worried about text-centric approaches to science education
  - Text domination
  - Word domination

# Science educators are rightfully suspicious of literacy, especially text-driven science curriculum.

## Apprehensions about text:

- Science texts more often provide declarations of 'fact' than real representations of the scientific enterprise.
- Science texts, particularly trade books, often include misinformation, oversimplifications, exaggerations, and other misrepresentations.
- Text can eclipse scientific discovery, taking the place of observation and experimentation and supplanting children's involvement in inquiry.

# Many science educators are apprehensive about vocabulary instruction

## Apprehensions about vocabulary:

- Long tradition of science as memorization of new words—high school biology texts have 45-50% more new words than are presented in a semester of foreign language. (Armstrong and Collier; 1990) (3500 new terms)
- Words are taught as an end unto themselves rather than as labels for new conceptual understandings

- Science vocabulary can serve as an obstacle to conceptual understanding—a common approach has been the "demystification" of science by using everyday rather than academic language--just avoids the problem

# Existing Research

- Research on combined science-literacy education, including:
  - Palincsar & Magnusson, 2001: GISML: Modeled on how scientists use literacy
  - Guthrie, et al., 1999:  CORI:
  - Romance & Vitale, 1992: Replace language arts instruction with integrated science/literacy instruction
  - Yore:  role of literacy in science

# Palincsar & Magnusson

- Key element: First versus second-hand investigations
- Examine reading and writing as tools to support first-hand learning
- Literacy can play a key role in second hand…
  - to bolster and reinforce learnings from first-hand investigations,
  - to take students on vicarious journeys (deep in the ocean, far into outer space, or inside a volcano) that are curricularly impossible in first-hand ways, and
  - to provide students with an opportunity to apply the inquiry-based skills and processes acquired in first-hand investigations to new domains of inquiry (e.g., drawing conclusions based on reading an account of an investigation).

# Romance and Vitale: the early version

- Design and implement integrated curriculum
- Used vicarious text-based experiences as a ‘test bed’ for applying knowledge and reasoning skills that students were supposed to have gained in first-hand science investigations
- Control group:  Same content but thoroughly encapsulated science and literacy
- Integration wins for reading, science, attitudes

# Mike Klenchy and colleagues

- Trying to make science-literacy integration real for many, many years.

## John Guthrie (UMD) and colleagues

# CORI: Concept Oriented Reading Instruction

- Embedded within knowledge acquisition goals/activities
  - Facts-->Concepts-->Patterns
- Reading and writing as tools for learning
- Implemented within thematic units, such as…
  - Adaptation
  - Solar System
  - Simple Machines

# Student step 1

- Observe and Personalize: Experience based, with text support (Bird study with *Owl Moon* text): generate questions to answer with further science and text investigations

# Student step 2

- Search and Retrieve: Use questions as a guide to examine texts (note plural)
  - One or two expository
  - Maybe a novel or chapter book

# Student Step 3

- Comprehend and Integrate: pot pouri in which lots of explicit instruction is provided across texts for various strategies:
  - Summarization
  - Comprehension monitoring
  - Visual displays to portray synthesis

# Student step 4

- Communicate to others: Presentations, often in teams, to convey what has been learned across the weeks of the unit.

# Contextual Features

- Learning and Knowledge Goals:  R&W as tools
- Real-World Interaction: Hands on with literacy support
- Support for independence and autonomy
- Support for collaboration
- Interesting text:  lots of narrative supports for science

# Research Base for CORI

- Compared to students who got conventional reading and science on transfer tasks (answering questions), CORI students exhibit, on average,
  - effect sizes of about .40
- Reading across texts
  - effect sizes of .75 or so
- Motivation:
  - ES of up to 1.9

# Context for Our Work

- NSF-funded *Seeds of Science/Roots of Reading* Program
- Collaborators: UC-Berkeley's Lawrence Hall of Science and Graduate School of Education
- Revision of GEMS units to integrate literacy with firsthand science
- Curriculum development and research

# A caveat!!!

- These materials are available commerically
- NSF requires us to find a publisher for purposes of dissemination and uptake
- All royalties go back to LHS for future R&D; no individuals get a dime.
- But I need to be up front about that
- Nothing we do today absolutely requires the use of these particular materials
- It's all about problem-based learning and integrated instruction.

# Guiding Principle 1: Engage students in firsthand and secondhand investigations to make sense of the natural world.

# Guiding Principle 2:
# Engage students through multiple learning modalities

## The Seeds/Roots Approach

| Inquiry-Only Approaches | | Text-Only Approaches |
|---|---|---|
| | **Do It** | |
| | **Talk It** | |
| Hands-On Ex| | Reading |
| | **Read It** | |
| Discussior | **Write It** | Writing |

# Guiding Principle 3: Capitalize on Synergies Between Science and Literacy

# Check the appropriate box

| Cognitive Activity | Literacy | Science | Both |
|---|---|---|---|
| Summarizing | | | |
| Searching for information in a text | | | |
| Communicating findings | | | |
| Engaging in discourse | | | |
| Posing questions | | | |
| Making explanations from evidence | | | |
| Writing reflections | | | |
| Making/reviewing predictions | | | |
| Drawing inferences/conclusions | | | |

# Synergy 1: Some Shared Strategies

Activating Prior Knowledge

Establishing Purpose/Setting Goals

Making and Reviewing Predictions

Drawing Inferences and Conclusions

Recognizing Relationships

| Shared Strategy | Common Questions | Example in Science | Example in Literacy |
|---|---|---|---|
| Activating prior knowledge | What do I already know?<br>What do I know now that I didn't know before? | Students use an anticipatory chart to monitor their growing knowledge of shorelines and the organisms that live on shorelines. | Before reading a book about earthworms, students discuss what they have learned from their hands-on observations of earthworms. |
| Establishing purposes-goals | Why am I reading/doing this?<br>What am I trying to learn?<br>What information am I seeking? | Before engaging in guided investigations of their shoreline organisms, students write about what they want to learn through their investigations. | Having investigated the effects of oil spills through a series of hands-on science activities, students discuss what they still want to know before reading the book, *Black Tide*. |
| Making-reviewing predictions | What do I think is going to happen? | Students continually make, review, and revise their predictions about what will happen in a worm bin—and they document the growing evidence that soil is being made. | Students make predictions about what a habitat scientist is and does before reading the book *Habitat Scientist*; they review and revise those predictions during and after reading. |
| Drawing inferences and conclusions | What does this mean?<br>How do I explain x? | Students gather evidence from a bucket of beach sand to answer the question, "What is sand made of?" | Students use a scientists' sand journal to make inferences about the origins of sand samples. |
| Making connections-recognizing relationships | What caused x?<br>How are x and y related?<br>How is x like/unlike y? | Students compare the adaptations of different isopods. | Students use a reference reader about substances to select ingredients that will help them make paint with particular properties. |

# Can the same rubrics be used to evaluate student abilities in both domains?

# Making Predictions

1. Makes prediction with no apparent reasoning
2. Provides prediction supported by unrelated evidence
3. Provides prediction supported by related evidence
4. Is able to revise prediction to take into account additional evidence
5. Assesses the nature and quality of evidence

# Evidence-based Explanations

1. Explanation does not refer to evidence
2. Cites some evidence to support explanation
3. Cites multiple pieces of evidence to support an explanation
4. Synthesizes evidence to create explanations beyond what the students have been taught
5. Assesses the nature and quality of the evidence

# Operating Theory: Comprehension Strategies are Inquiry Strategies!!

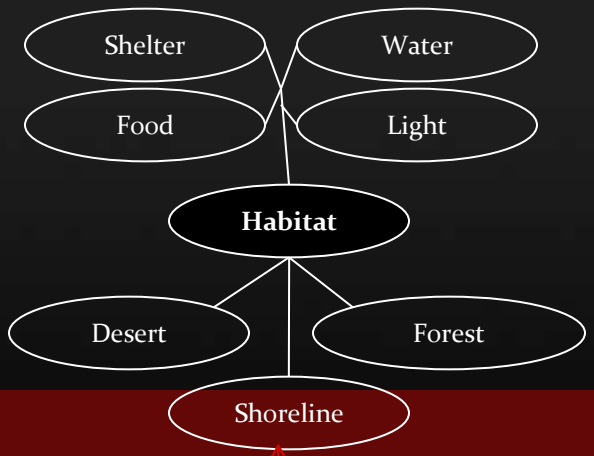
- Comprehension and inquiry are the accepted meaning making strategies in science and literacy
- Comprehension and inquiry share goals and strategies

# Synergy 2: Words ARE Concepts

- Learning the academic language of science means forming rich conceptual networks of words
- Word knowledge at its most mature is conceptual knowledge
- Words are labels for concepts and ideas
- Excellent vocabulary development is nearly indistinguishable from excellent concept development

# Words are Concepts

## Habitat




**If we wish to maintain a terrarium in our classrooms, we should establish conditions that are consistent with the organisms' natural habitats.**

| Recognition | Definition | Relationships | Context | Application | Synthesis |
|---|---|---|---|---|---|
| | **Habitat:** the place where an organism gets the food, water, light, and shelter that it needs to survive | | A habitat has everything an animal needs to survive. The grassland habitat is windy with few trees. | | **All living things exist within habitats and have adaptations that allow them to survive in those habitats. No one habitat can support all living habitats.** |

# Synergy 3: Science is a Discourse

- Science is all about language…but language is more than words. Science is a discourse involving ways of talking, writing, and being.
- Learning science includes learning the ways that scientists describe, explain, predict, synthesize, and argue
- Ways of communicating in science are different from those of everyday life

# Bottom line

- Difficult journey
- Well worth the effort
  - Improved literacy
  - Improved science
  - Increased efficacy for
    - Students
    - Teachers

# *Reading and writing are better when they are tools not goals*

- **If we don't realign the current curricular imbalances, science and social studies may suffer…**
- **but ultimately reading and writing will suffer**
- **reading and writing are <u>not</u> about reading and writing in <u>general</u>**
- **they are about reading and writing <u>particulartexts</u> that are grounded in <u>particular experiences</u>**
- **they both depend upon the existence, the acquisition and the utilization of <u>knowledge</u> (note the comprehension revolution!)**
- **not knowledge in general but knowledge of particular disciplines, domains of inquiry, topics, patterns, concepts, and facts**
- **In short, the very stuff of subject matter curriculum!**

NY Times, Tuesday, March 28, 2006

# Our current view of curriculum

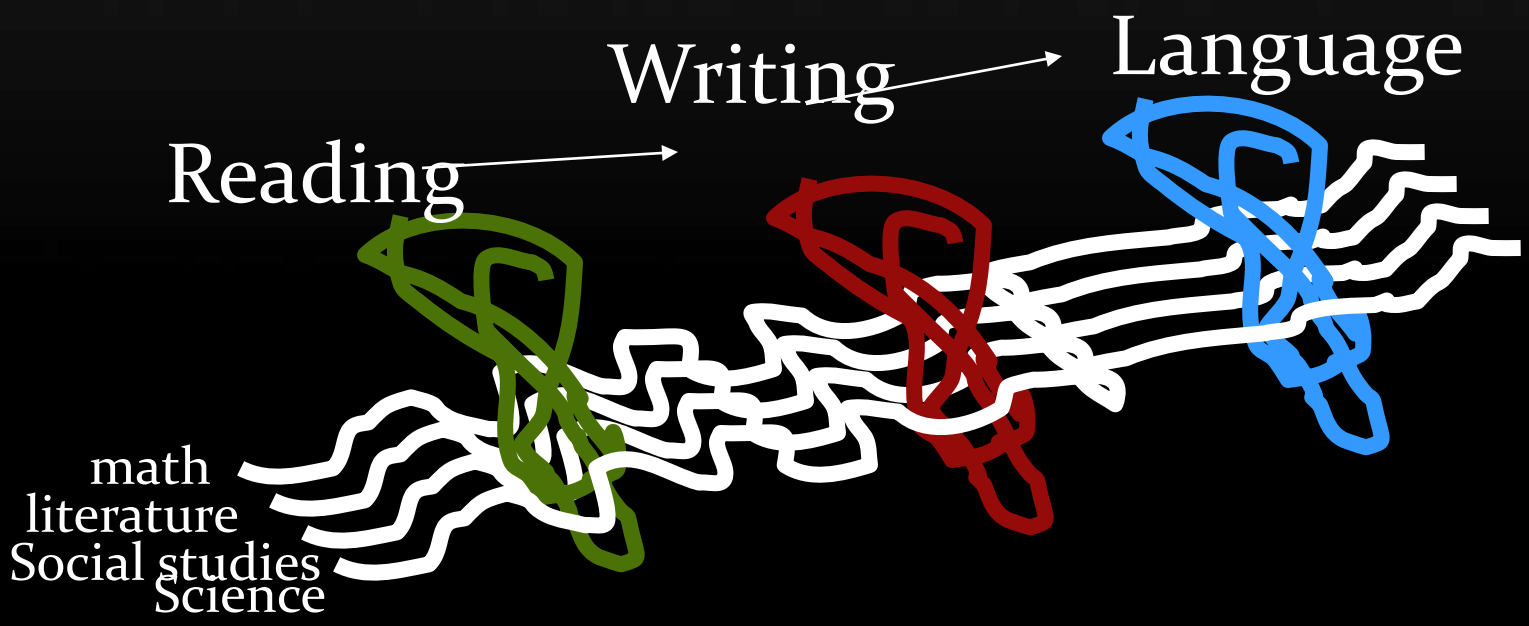
# A model we like: Tools by Disciplines

Academic Disciplines.....

Language Tools

| | Science | Social Studies | Mathe-matics | ***Literature*** |
|---|---|---|---|---|
| Reading | | | | |
| Writing | | | | |
| Language | | | | |

# Weaving is even a better metaphor than a matrix




Reading
Writing
Language
Social Studies