Chapter 6

The Instructional Process

Strategies for Developing Information Literacy

Strategy 1: Writing/Keeping a Journal
Strategy 2: Challenging Learners as They Develop Questions and Pose Problems.
Strategy 3: Tapping Prior Knowledge
Strategy 4: Building Background
Strategy 5: Using Graphic Organizers
Strategy 6: Guiding Students Into, Through, and Beyond Learning Resources
Strategy 7: Developing Effective Searches
Strategy 8: I-Search: Personalizing a Research Project/Paper
Strategy 9: Establishing Audience
Strategy 10: Collaborative Grouping/Cooperative Learning
Strategy 11: Tapping the Multiple Intelligences
Strategy 12: Specially Designed Academic Instruction in English (SDAIE)
Developing Critical Thinking

Information literacy is best developed through thinking strategies. Thus library media specialists concentrate on helping students internalize a model that will stimulate thinking. In a thinking, meaning-centered curriculum, these strategies are embedded in instruction in all curricular areas rather than being taught to the student as if they were a discrete part of the curriculum. Thus, information literacy is not one of “the 4 Rs,” but an integral part of them.

A common thread of many state and national documents advocating educational reform is their reference to instructional strategies that lead students to think more deeply and to unlock meaning through learning experiences. Although the curricular areas to which these learning experiences apply are varied and apparently distinct (e.g., science, ESL, foreign language, English-language arts, history-social science), the instructional strategies are strikingly similar. For example, logs or journals are recommended to help students reflect on their readings, observations or activities. Quickwrites and brainstorming are used to reveal what students already know about a question, topic, or problem. These strategies are also suitable for developing information literacy. Curriculum implementation and information literacy are integrally entwined.

Strategies to facilitate information literacy can be developed by using the best pedagogy from all areas of educational theory and practice. This chapter provides a description of some of these strategies and suggests how they can be used to achieve the objectives of both the curricular content area and information literacy.

The curricular planning team will want to adapt the strategies to the appropriate developmental level and sophistication of the students. In addition the team should evaluate the strategies carefully for the effect on student motivation and learning. Finally, the team should choose those instructional strategies that contribute to each student’s ability to:

• access information,
• evaluate information, and
• use information.

Summary of Strategies

Twelve strategies have been selected for this handbook.

Strategy 1: Writing/Keeping a Journal
Strategy 2: Challenging Learners as They Develop Questions and Pose Problems.
Strategy 3: Tapping Prior Knowledge
Strategy 4: Building Background
Strategy 5: Using Graphic Organizers

From Library Skills to Information Literacy
Strategy 1: Writing/Keeping a Journal

A log or journal is the searcher’s ongoing written account of the search process. Students who are information literate must develop the ability to recognize what they are doing, analyze the results, and consider or reflect on how any learning based on these results might be applied in another situation. If learning is to take place, such reflection is essential.

Journal writing is one strategy that engages the writer in reflection. Journal writing provides unique opportunities for reflection and for the use of language allowing a flexibility that can unlock meaning and enhance understanding. Since journals are not graded or corrected they are also safe places for English learners to experiment with language.

Journals written in any language or combination of languages enable learners to reflect, bring clarity to their thinking, and learn from their experiences. Preliterate students at any grade level might dictate to an aide, a tutor, a friend, or family member. The use of a simple word processor may stimulate, facilitate, and enrich journal writing.

The search process journal is used by the searcher to record the progress of a search, such as: What was my question? What did I do? What did I find? What did I learn? How did I feel? The journal also is used to project, such as: How might this experience apply to future searches? What allowed me to gain the most from this experience? What would I do differently if I had time to return to the project? In this way the journal becomes a tool for evaluating the information, the search process, and the learning that took place.

The journal format is simple. A blank sheet of paper may be divided into columns, with a heading for each column to help organize the writer’s com-
ments. The headings vary with the objective for keeping the journal. The California Literature Project identifies several different kinds of journals, most of which would be useful to students for clarifying what is happening as they access information:

- **Learning Log**: Note-taking/Note-making.
- **Problem Solution**: Problem(s)/Resolving the problem(s).
- **Reflective**: What happened/How I felt/What I learned OR What I did/What I learned/What questions do I still have?
- **Prediction/Speculation**: What happened/What might or should happen?
- **Synthesis**: What I did/What I learned/How I can use it?
- **Dialectic/Discussion**: Quotation/Response.

The following quote from Practical Ideas for Teaching Writing as a Process confirms the use of the journal as a tool for personal reflection.

> ...The self as audience is crucial to young writers’ development, because it allows students to discover how the act of writing can be functional for them...Keeping logs or journals of reactions to class, events, to books or films or TV programs, and to chapters in a textbook can be a valuable first step in making personal sense of new information. Writing to work out new ideas, to raise questions, and to find out what one understands enables students to see that writing can be of direct benefit to them... Because students have an extended record of their own emerging opinions and understandings, they have themselves as resources when it comes to developing and shaping an essay or a final report. The teacher can encourage this type of writing by providing models of subject matter journals or logs, by setting aside class time for this writing, by allowing credit toward the final grade for completion of such writing, and by allowing students to keep their logs handy during the writing of tests or essays in class.

For English learners, the journal provides another means to blend both familiar and new personal experiences, knowledge, feelings, and data to create new insights. It also verifies once again the value of their own writing — in whatever language they choose to write. A sample of a science journal page is followed by an example of a generic journal.2
### SCIENCE JOURNAL

<table>
<thead>
<tr>
<th>Observations/Facts</th>
<th>Hypotheses/Opinions/Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Suggestions:</strong> What is happening? What words describe the event? What do I see? What changes are occurring? What properties does it have?</td>
<td><strong>Suggestions:</strong> Why do I think this is happening? What questions are raised in my mind? What have I observed in the past that is similar?</td>
</tr>
<tr>
<td><strong>Primary:</strong> What I know.</td>
<td><strong>Primary:</strong> What I learned</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Searcher’s Thinking: My Questions</td>
<td></td>
</tr>
</tbody>
</table>
Strategy 2: Challenging Learners as They Develop Questions and Pose Problems

Information literacy is developed in a meaningful quest for information. All components of the information literacy model (See Chapter 2) are initiated by the learner’s need to know. The search for information becomes compelling when the question or problem is relevant and significant to the searcher. Typically, the most interesting and most important questions are those for which there is no single right answer, or perhaps, no clearly right answer at all.

Students ask and answer questions in all languages. In working with students, we must validate the importance of the questions that they are asking. We must listen carefully to their needs for information. It is important to acknowledge that their questions and information needs may be different from those imposed by the curriculum; yet the relevance of these personal information needs to the learner can present valuable opportunities for the development of information literacy. How can we develop these opportunities? How should we respond to students’ questions?

Deborah Short, in her monograph titled Integrating Language and Content Instruction: Strategies and Techniques focuses on the needs of English learners and advises teachers to “increase the percentage of inferential and higher-order thinking questions asked” and to “use inquiry learning.” She explains that:

These questions encourage students to expand their reasoning ability by developing and practicing skills such as hypothesizing, inferencing, analyzing, justifying, and predicting. The language used by the teacher or students need not be complex for thinking skills to be exercised. For example, to help students predict, a teacher might read the title of a story and ask, “What will this story tell us?” Teachers need to model critical thinking skills in a step-by-step approach to reasoning.

In an article titled “Answering Questions and Questioning Answers, Guiding Children to Intellectual Excellence,” Robert Sternberg notes that “Children are natural question-askers;” but he also identifies a critical role for adults in getting them to ask good questions. He identifies seven levels of adult responses to children’s questions and arranges them as a model of interaction that can serve as a guide in helping children to develop thinking skills. The lower levels of response, although most common, do not appear to be very constructive:

- Level 1. Rejection of questions (e.g., “Don’t ask”).
- Level 2. Restatement of questions as responses (e.g., “That’s how it is”).
- Level 3. Admission of ignorance or presentation of information (e.g., “I don’t know” or “The answer is . . .”).
Beginning with Level 4, adults take the opportunity to involve the child in seeking information in order to answer the question.

Level 4. Encouragement to seek response through authority (e.g., “What does ______ say?”).
Level 5. Consideration of alternative explanations (e.g., “It could be this or it could be that”).
Level 6. Consideration of explanations plus means of evaluating them (e.g., “That sounds logical, but how could we check to be sure?”).
Level 7. Consideration of explanations plus means of evaluating them and follow-through on evaluations (e.g., “I think you’re right, but here’s an almanac so let’s check the index and look it up”).

Sternberg also notes that “as we move up the levels . . . we go from no learning to passive rote learning to analytic and creative learning. . . .” He continues:

▼ Children are taught that information can be sought out. If the parent or teacher takes responsibility for looking up the answer, children will learn that information can be sought but that someone else should do the seeking. . . . If children are offered the opportunity to find the information themselves . . . they assume the responsibility for their own learning. . . . They develop their own information-seeking skills. . . .

Finally, Sternberg emphasizes that “higher-level strategies described here are ones that can be used by teachers in any classroom and by parents at any economic level.” We would add and in any language. Beth Casey and Edwin Tucker, in their article on “Problem-Centered Classrooms: Creating Lifelong Learners,” suggest that “The teacher’s primary role . . . is to pose open-ended problems and ask open-ended questions.”

Teachers and students should learn to generate essential questions. On the next two pages “Scientific Thinking Processes” suggests to teachers a variety of questions that can be asked students as they proceed through an inquiry. They invite learners to access, evaluate, and use information as they formulate thoughtful responses. Because they imply many modes for accessing and responding, they are particularly applicable for English learners. While they suggest science content, they can be refocused and used to stimulate thinking in other content areas.
Scientific Thinking Processes

Observing
The scientific thinking process from which fundamental patterns of the world are constructed
Teacher’s statements and questions that facilitate the process of observing:
- “Tell us what you see.”
- “What does this feel like?”
- “Give us information about its shape and size.”
- “What do you hear?”
- “Point out the properties that you observe.”
- “What characteristics seem to be predominant?”
- “What properties can you find?”

Communicating
The scientific thinking process that conveys ideas through social interchanges
Teacher’s statements and questions that facilitate the process of communicating:
- “What do you see?”
- “Draw a picture of what you see through the microscope.”
- “Plot the data you gathered on a graph.”
- “Make a histogram of the number of raisins in slices of raisin bread.”
- “Write up your experiment so it can be replicated by someone else.”
- “Summarize your findings and present them to the class.”

Comparing
The scientific thinking process that deals with concepts of similarities and differences
Teacher’s statements and questions that facilitate the process of comparing:
- “How are these alike?”
- “How are these different?”
- “Compare these on the basis of similarities and differences.”
- “Which is larger/smaller; softer/louder; smoother/rougher; wetter/drier?”

Ordering
The scientific thinking process that deals with patterns of sequence and serialization
Teacher’s statements and questions that facilitate the process of ordering:
- “Which came first, second, last?”
- “What is the range in the data you gathered?”
- “In what order did these events take place?”
- “Where in the order would you place these (for inserting in a range)?”
- “Give evidence of when the pattern repeats itself.”
Categorizing
The scientific thinking process that deals with patterns of groups and classes
Teacher’s statements and questions that facilitate the process of classifying:
• “On what basis would you group these objects?”
• “Put together all those that you think belong together.”
• “What is another way in which these minerals can be categorized?”
• “Identify several characteristics you used to classify these rocks.”
• “What grouping best reflects the evolutionary history of these animals?”

Relating
The scientific thinking process that deals with principles concerning interactions
Teacher’s statements and questions that facilitate the process of relating:
• “What factors caused the event to take place?”
• “Explain why this is a good or inadequate experimental design.”
• “State a hypothesis so that it is testable.”
• “What is the relationship between the coloration of an animal, its environment, and its predators?”
• “Using this line graph, tell the relationship between distance and time.”
• “Design a study to compare the evaporation rates of different liquids (e.g., alcohol and water).”

Inferring
The scientific thinking process that deals with ideas that are remote in time and space
Teacher’s statements and questions that facilitate the process of inferring:
• “What can you infer from these data?”
• “What arguments can you give to support your prediction?”
• “Explain how we know about quasars.”
• “Under what conditions are we able to extrapolate or interpolate from data?”
• “How would you determine how many frogs live in a pond?”

Applying
The scientific thinking process by which we use knowledge
Teacher’s statements and questions that facilitate the process of applying:
• “See who can invent a glider that will stay aloft the longest time.”
• “Design a way to keep an ice cube on your desk all day without melting.”
• “What political points of view must be considered if we are to protect the migration flight paths of birds over several countries?”
• “What factors must be weighed if experimentation on animals is to take place?”
• “How did different lines of evidence confirm a theory of continental drift?”

80
Strategy 3: Tapping Prior Knowledge

For students to be engaged in meaningful problem solving or information quests, they must begin with and eventually connect to their own prior knowledge about the question or problem. The focus on prior knowledge is both a validation and confirmation of the value of their personal experience and the key to a rich source of information.

Prior knowledge is key to the academic success of all students. Alfredo Schifini emphasizes the importance of prior knowledge in the education of English learners.

Prior knowledge — what he or she already knows, understands, believes about the world and how it operates — seems to be the single most important indicator of academic success for English learners. Concept development and comprehension both depend and build upon a student’s prior knowledge.¹²

Students come from homes filled with a variety of information. Tapping into rich information that exists in each home is a strategy that validates home knowledge. Luis Moll points out that this variety of knowledge should be recognized in all families.

Contrary to the deficit view about the experiences, resources, and knowledge of bilingual students, their homes, families, and communities have developed complex and rich information networks as strategies that households use to survive, to get ahead, or to thrive.¹³

Several instructional strategies are useful for tapping the prior knowledge students bring to the classroom. When engaged in these activities, students should be free to use any language or combination of languages that is most comfortable for them. Facts, details, and information that pour forth during these activities can be organized later as students begin to channel ideas. The important concept in the activities described below is the free flow of ideas. Clarifying language and checking facts for accuracy come later.

Brainstorming

Brainstorming is a basic strategy proposed for use in eliciting students’ prior knowledge. When brainstorming, searchers ask, “What comes to mind when we think about this topic?” All possibilities are recorded as individual words or phrases, and all ideas are accepted. Evaluation of the ideas comes at a later stage. The purpose of brainstorming is to generate a wide range of possible approaches.
In the planning or beginning of a unit,...a non-evaluative brainstorming session or survey is conducted with the students to establish what they already know about a particular topic and to help them realize what information they don’t have...The brainstorming or survey method encourages students to participate in a non-threatening activity. A lively brainstorming session can also arouse the students’ natural curiosity and lead them to ask questions they might not have thought of on their own. By getting a sense of the students’ prior knowledge through the brainstorming activity, the teacher can focus instruction so that it connects appropriately to the background knowledge of the students.\textsuperscript{14}

**Quickwrite**

Quickwrite is a written kind of brainstorming. This description of the quickwrite activity captures the intellectual energy it generates.

\textbf{▼} It is a special kind of writing that lets students use the act of writing itself to discover what they already know. It works only if students write without planning and without looking back...students write breathlessly/recklessly/passionately until their fingers are tired or for a given amount of time (e.g., two or three minutes). They write anything that they can think of about the topic. If students reach a point where they can’t think of anything to write, they repeat the last word until something new comes to mind. Students do not worry about punctuation, spelling, or grammar...They just write!\textsuperscript{15}

**K-W-L-A**

K-W-L-A — These initials refer to the metacognitive format that involves a three part thinking process. Students respond to:

- What they Know,
- What they Want to know,
- What they have Learned, and
- What they feel about what they have learned (Affect).

This process activates previous knowledge, provides a purpose for investigation, and summarizes what has been learned.

**Organizing Ideas**

These pre-research activities can be used to help students establish the scope of research and to develop related areas of inquiry. Once ideas are generated, the searcher begins the process of organizing ideas in logical clusters to provide focus for research. Webbing and mapping ideas (discussed in detail in Strategy 5), are
intermediate steps in the research process. They provide a guide to locating significant information and to outlining the final presentation.

**Strategy 4: Building Background**

Often, students do not have sufficient background knowledge to launch an investigation of a problem or a unit of instruction. In this case, time needs to be spent building background and the following technique could be done at any grade level.

**Technique:**
Students read, view, hear, and experience a wide variety of information and cultural materials on a topic during the background phase of the unit.

**Suggested Activities:**
- Teacher reads aloud a book to introduce a topic.
- Students all read and discuss the same title (fiction or non-fiction).
- During sustained silent reading and at home, students read or view a wide variety of materials during the background phase of the unit.
- Students explore a wide variety of audiovisual and electronic sources.
- Teacher conducts a class discussion or seminar at the end of the background-building time. Experts add dimension to the discussion.
- Teacher creates a concept map with students as they draw comparisons or develop connections.

**Expectations:**
- Students consume and process as much information as possible.
- Deeper learning results as the amount of material is increased.
- A breadth of experience stimulates a rich dialog among students.
- As experience broadens and knowledge expands, interest and motivation increase.

**Assessment Strategies:**
- Using their wide experience, students summarize what they have learned in one or more formats.
- Teacher makes judgments of the level of student understanding.
- Tests measure the breadth of knowledge.

**Information Literacy Strategies:**
- Students become avid readers, viewers, and listeners.
- Students recognize a need for more information.
- Students begin to think critically about what they read, view, and hear.
- Students begin to use a wide variety of materials upon which to draw conclusions and synthesize their ideas.
• Students start linking what they already know with a variety of new information sources.
• Students begin the process of communicating their ideas to others.¹⁶

**Strategy 5: Using Graphic Organizers**

One of the key competencies of information literacy is the ability to organize information, thoughts, and ideas. A graphic organizer combines abstract thoughts, words, and text in a visual format that shows relationships.

The use of graphic organizers can have special benefits for English learners. Because the organizer is a visual structure, it communicates beyond specific language. Visuals take the place of prepositions and other abstract connectors. Labels are used to organize assorted bits and pieces of data, observations, and information into categories that show likeness, difference, sequence, or other relationships.

Words used in organizers may come from any language. In a language that is less familiar, words visually clustered may lead students to understandings and a-ha’s that would otherwise be more remote. Pictures or symbols can also be used instead of words to connote facts or ideas.

Timelines are an especially effective organizer for English learners. They can create a visual timeline of any topic from “My Day” to “My Life” to “My Country’s History” by drawing or clipping or copying illustrations. The text can be in any language and as comprehensive or minimal as the student chooses.

The examples on the following pages show how graphic organizers might be applied to information from scientific observation and how webbing can extend vocabulary and build verbal relationships in any language. There also are examples of the Venn diagram, a graphic organizer that is particularly applicable to Boolean logic. This important concept is applied to search strategies for many technology-based information sources.
Webbing

Webbing is a visual way of organizing related words and ideas. A web has three organizing elements: (1) main topic, (2) categories, and (3) examples.\textsuperscript{17}
Students can build webs in any language. The ones below were created by fourth graders in Mary Tran’s class at Willmore School in the Westminster School District.18
Mapping

Learners create an organized visual presentation that connects ideas and shows their relationship to a main concept. Teachers may also provide a mapped lecturette for students to take notes on during a video, demonstration or text reading.19

Example of “Spider Web” Mapping

- Insects

**Detail**

- 3 body parts: head, thorax, abdomen
- 6 legs: jointed
- adapted to their environment: color, shape, weapons

- often live in colonies: have roles, interdependent

- provide food for other living things: other insects, birds, people
Series of Events Chain

Students may use this visual organizer to describe: (1) the stages of a cycle, (2) the steps in a linear procedure, and (3) a sequence of events.20

Initiating Event

Event 1

Event 2

Event 3

Final Outcome

Time Lines

Time lines help to create a structure in which events, circumstances, or ideas can be visualized in their historical perspectives. Time lines can be made with pictures, symbols, labels, or anything that can be used to display time — and in any language. Timelines can show periods of growth and decline, relationships, and cause and effects. The following might be used as a generic student group task sheet for reading and creating time lines.21

<table>
<thead>
<tr>
<th>Reading a Time Line</th>
<th>Creating a Time Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Study the title.</td>
<td>1. Decide on the period of time.</td>
</tr>
<tr>
<td>2. Determine its framework.</td>
<td>2. Create a title.</td>
</tr>
<tr>
<td>a. Note the years covered.</td>
<td>3. Determine time intervals and events.</td>
</tr>
<tr>
<td>b. Study the intervals between periods of time.</td>
<td>4. Use a ruler to create a proportional time line. Make space between dates the same.</td>
</tr>
<tr>
<td>3. Study the key events and mentally associate people, places and other events.</td>
<td>5. Use written or visual labels.</td>
</tr>
<tr>
<td>4. Note relationships.</td>
<td></td>
</tr>
<tr>
<td>5. Use the time line as a summary.</td>
<td></td>
</tr>
</tbody>
</table>

Suggestions:

1. Use literary examples of time lines as models.
2. Students and teachers create a rubric for grading that reflects the processes taken toward creation of the end product.
3. Create a short, written summary of the time line.
Comparing and Contrasting

To encourage students to compare and contrast ideas or objects, have the students make a T chart on a piece of butcher paper. The students first find similarities and list those on the left side of the T. Then students look for differences and list those on the right side of the T. Students display other charts and discuss them with members of the other groups.\textsuperscript{22}

**T-Chart**

| ALIKE | DIFFERENT |

Venn Diagram

Using two overlapping circles, students chart the differences and similarities between two events or phenomena. A Venn diagram is also a useful visual representation of the Boolean logic that is often used for searching information in technology-based resources.
Strategy 6: Guiding Students Into, Through, and Beyond Learning Resources

“Making meaning” is an essential skill for all learners – one that can be developed as we guide students into, through, and beyond a wide variety of learning resources. For English learners this technique can be an especially important one that helps to develop comprehension and vocabulary.23

INTO

Build background and activate students’ prior knowledge:

1. Share background information about the learning resource being introduced: topic, question or problem posed, setting, time period, author and title, country of origin, language used, and other facts.
2. Discuss general questions related to key concepts.
3. Use new vocabulary in context.
4. When bilingual versions of resources are used, discuss differences between the versions.
5. Introduce key concepts, using related books or media.
6. Have students make predictions.
7. Set purposes for the activities to follow.

THROUGH

Experience a book, video, film, or other learning resource:

1. Pair or group students for reading, listening, or viewing. When appropriate, pair English learners with fluent English speakers.
2. Have students re-predict as new information is added.
3. Think aloud with students to guide them through confusing parts.
4. Check for language comprehension frequently.
5. Read or review quickly to get an overview of the content (skimming).
6. Make analogies to link prior knowledge with new knowledge.
7. Compare audio and visual information to text:
   a. If the medium is text, have students use visual or audio means to communicate their understandings of the content.
   b. If the medium is visual or audio, have students use oral or written means to communicate their understandings of the content.
8. Have students use nonverbal strategies to summarize concepts.
9. Ask open-ended questions that have no right or wrong answers.
10. Have students use mapping or organizing strategies to clarify comprehension.
BEYOND

Extend students’ learning:

1. Discuss INTO questions in light of students’ experience with the learning resource used.
2. Engage students in activities that help them to connect the new information to their personal experience and tie new vocabulary to prior knowledge.
3. Discuss questions such as “What if? Why?”
4. Engage students in activities that relate the learning resource to other curricular areas.
5. Compare resources that deal with similar themes and issues.
6. Explore related resources (e.g., on the same topic, in the same genre, by the same author or illustrator, with a similar plot structure or similar character(s), or in other media, languages, or formats).

Strategy 7: Developing Effective Searches

One of the most challenging aspects of the search process is the analysis of the problem and the related need for information. What is it I really need to know? How is this kind of information likely to be organized or identified? What headings, key words, descriptions can I use? How are parts of this topic/problem related to each other? As students work out these problems, they are developing search strategies. As new technology provides access to exponentially increasing amounts and varieties of data, our ability to retrieve the needed information will depend on the extent to which effective search strategies can be analyzed and developed.

The following section presents two basic search strategy concepts: 1) key word search, and 2) Boolean logic. While these are sophisticated intellectual concepts, they should be introduced early and developed in depth consistent with students’ intellectual development. These strategies can be applied to searching for information in any format, from library catalogs to Internet sources.
Key Word Search

Students need to develop skills in analyzing the key concepts and elements in their search questions to develop appropriate search strategies. How is information on their topic likely to be indexed? What key words or phrases will they need to use? The following materials suggest questions that should help students develop patterns for exploring their information needs. While these basic patterns can be applied in most situations, they are only examples of search analysis concepts. You and your students may discover or develop other patterns that can be used in developing search strategies.24
<table>
<thead>
<tr>
<th>RESEARCH PROBLEM</th>
<th><strong>How do you raise butterflies?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>KEY WORDS</td>
<td><strong>Butterflies, Caterpillars</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Moths, Butterfly farming</strong></td>
</tr>
<tr>
<td>DIFFERENT SPELLINGS</td>
<td><strong>Butterfly</strong></td>
</tr>
<tr>
<td>SYNONYMS</td>
<td><strong>Butterfly attracting</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Butterfly gardening</strong></td>
</tr>
<tr>
<td>LARGER SUBJECTS</td>
<td><strong>Insects, Lepidoptera</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Insect rearing</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Entomology</strong></td>
</tr>
<tr>
<td>NARROWER SUBJECTS</td>
<td><strong>Names of different species:</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Monarch butterfly, Milkweed butterfly,</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Lecery butterfly, etc.</strong></td>
</tr>
<tr>
<td>INTERSECTING SUBJECTS</td>
<td><strong>Butterflies, Conservation</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Ecology</strong></td>
</tr>
</tbody>
</table>
RESEARCH PROBLEM
How were the Japanese Americans who were placed in relocation camps in the United States during World War II treated?

KEYWORDS
Japanese Americans, Relocation camps

DIFFERENT SPELLINGS
Nisei, Internment camps

SYNONYMS

LARGER SUBJECTS
World War, 1939-1945
Prisoners of War — United States
Concentration camps, Refugees
Evacuation of civilians

NARROWER SUBJECTS
Manzanar, Tule Lake Relocation Center
(other individual relocation camps)
Korematsu v. United States

INTERSECTING SUBJECTS
World War, 1939-1945 — Japanese Americans
United States, Internment
**Boolean Logic**

For many kinds of information searches it is important to analyze and develop relationships between the concepts or key ideas that you are using. This is especially important in computer-assisted searching, either online or on CD-ROM. Once you have identified concepts and selected suitable key words or phrases, you can establish the relationships that most clearly define or limit your search. For most electronic searching three words - or, and, not - are used as logical operators in a system developed by George Boole, a mathematician. The basic uses of these Boolean operators are defined briefly below. The diagrams used to illustrate these logical operators are called Venn diagrams.

**Search question:** How are German Shepherds trained to be seeing eye dogs?

**Or**
Used for synonymous terms; indicates that you want information on either topic.
Example:
- Seeing Eye dogs
  - or
- Guide dogs
You get lots of information.

**And**
Used to connect two terms or ideas; you want only the information that contains both concepts together.
Example:
- Seeing Eye dogs
  - and
- German Shepherds
Information is limited

**Not**
Used to exclude a term or idea; you do not want information on this topic.
Example:
- Seeing Eye dogs
  - not
- Golden Retrievers
Information is narrowed
Strategy 8: I-Search: Personalizing a Research Project/Paper

Ken Macrorie has coined the term “I-Search” to connote an original search to fulfill the searcher’s need for information. Students learn and practice searching skills: gathering information, sifting it, analyzing and synthesizing it, and then reformulating it for an important purpose of their own. In his classes, students compose a paper chronicling their search and what they found.

Any search can become an I-Search if the student takes ownership of the question, problem or topic. The following steps can be applied to the development of any paper or of any other kind of presentation that is a product of research.

Steps in an I-Search Paper

Jenee Gossard, educational consultant, describes a process that she uses with students.

1. **Letting a Topic Choose You**: Macrorie asks students to “Allow something to choose you that you want intensely to know or possess .... that will fulfill a need in your life rather than a teacher’s notion of what would be good for you to pursue.” My students cluster, share, and discuss possible topics of personal significance. For one or two of these they write short answers to the following questions:
   a. Why is this issue important right now in your life?
   b. What do you already know about it?

   After sharing their possible topics in a small group, students focus on the topic that is most meaningful to them personally.

2. **Searching**: Students gather information on their topic in several ways:
   a. Talking: casual conversations to formal interviews.
   b. Observation: sensory data, information, impressions.
   c. Participation: first-hand experience.
   d. Collecting: brochures, fliers, manuals, ads, objects.
   e. Reading: relevant print sources.

3. **Sharing and Reporting**: Students share and report regularly on their search process:
   a. Initial sharing: students share topics in small groups (5-7), then with the whole class.
   b. Weekly updates: a two-page summary detailing the week’s progress, shared orally in read-around groups.
   c. Plenary sessions: (every other week) five-minute written summaries of major progress to date, read aloud to the class.
4. **Practice Assignments:** Students draft, share, and revise two short papers to practice skills needed in the I-Search paper:
   a. Observation report using all sensory information.
   b. Interview quotes, summaries, connective narration.

5. **Readable Rough Draft:** Students synthesize their I-Search material (notes, updates, collected materials, practice assignments) into a coherent record of their search (5-8 pages). Beginning the draft, groups discuss:
   a. Purpose and audience.
   b. Organizational strategies: chronological, impressionistic, flashback, topical.
   c. Development: details, examples, descriptions, anecdotes, summaries, direct quotations, paraphrases.
   d. Structure: the draft must have at least four chapters addressing:
      - What did you search for?
      - Why was it important to you?
      - What did you know about it to begin with?
      - What did you learn (or not learn)?
      - What do you plan to do next, if anything?

6. **Revising:**
   a. Students exchange rough drafts and read several silently, then share their own orally with their read-around group.
   b. After reading and hearing a number of drafts, partners exchange papers, and make written comments on various aspects of organization and development.
   c. Students revise rough drafts based on their partners’ comments and other drafts they have seen.
   d. Students attach cover sheet to all revised drafts:
      - What specific changes did you make in this draft?
      - What effects do these changes create?
      - How do you feel about your paper now?

7. **Editing:** In small groups or pairs, students exchange and revise drafts pointing out effective/weak language: precise diction, fresh expressions, clichés, repetition, English, dead words, passive voice, etc. As a final step, pairs or groups proofread each other’s papers for surface errors in conventions.

8. **Preparing for Presentation of I-Search Papers:** Students present their papers to the class orally, three papers per class over a period of ten days. The room is arranged theater-style and guests are invited to each day’s presentation.
   a. To help students with effective titles for their I-Search projects, the following written exercise might be used in class:
      - Write a question as a working title: “Should I become a physical therapist?”
      - Write three more titles: another question, one using alliteration, one completely ridiculous.
• Cluster significant words/ ideas from your topic.
• Write three more titles using ideas from the cluster.
• Write a title reflecting the most important idea/ insight from your search.
• A decision prompted by your search.
• A bumper sticker advertising your search (6 words or less).

b. Invitation and program sent to invited guests (other teachers, administrators, classified staff, parents, local newspapers, etc.).
c. Oral skills practice session.

9. **Presenting the Final Draft**: Students read their I-Search papers orally, and then hand in their completed papers. The students:
a. Complete an oral presentation response sheet: each class member completes one evaluation sheet for one speaker each day.
b. Do self-evaluation and readers' affidavits: completed and signed forms must accompany the final draft.
c. Complete written final drafts due the day following the oral presentations.
d. Receive grades on the oral and the written versions of their I-Search.26

**Strategy 9: Establishing Audience**

Learners who are developing information literacy must think about the information they have gathered in order to evaluate, interpret, and make meaning. They should also have a purpose for using this information. A natural, challenging, and effective way to motivate and propel analysis and use of information is to establish an audience with which to communicate. Personalizing the communication of information adds the essential ingredient of relevance. The audience may be familiar or remote, an individual or a group, personal or official. The communication may be written (letters, reports); oral (telephone conversations, formal presentations, dramatizations); or visual (cartoons, displays, videotapes). The significance of establishing audience is that the learner has to determine the best way to communicate information to a specific person or group. The information has to be sorted, clarified, organized, reduced to essentials, or amplified with details and examples that help the reader, listener, or viewer understand the meaning.

English learners can extend the scope and impact of personal and group communication by helping their classmates reach new and important audiences. For example, they may be able to communicate effectively with individuals, groups, or agencies in the community or in other areas of the world as perhaps no one else can. When using nonverbal modes of communication, English learners can work together with their native English-speaking classmates to reach their common audiences. By offering students options to explore varied modes of communication, teachers can include English learners in integrated heterogeneous groups.
Mary Healy, Co-director of the Bay Area Writing Projects, emphasizes the importance of students' communicating with a real audience that can respond and suggests examples:

Beyond the variations of teacher as audience, many others can profitably be addressed in classroom writing. Students can write for their peers - either fellow students in their classes or those in other classes or other schools. The key point here is that this writing be genuinely addressed to an audience that will, indeed, read and respond to the writing. Only through this genuine response, with all the attendant confusion and misunderstandings, can a real sense of audience develop.\(^{27}\)

Applications to history-social science are obvious:

Writing letters to contemporary figures, agencies, or a friend or relative about current or historical issues can help students clarify their thinking on a topic and improve their basic writing skills. Fourth-grade students may write a letter to Cesar Chavez, expressing their views on pesticides used on the farms in the San Joaquin Valley. Students in grade twelve may write letters to the editor of a newspaper or to governmental officials or agencies regarding contemporary issues, such as acid rain, health care, taxes, or the plight of homeless people. Students may find it easier to express themselves about an issue in a letter format in which they use their own words and style than in an essay format. Students may give examples of, and elaborate on, what they relate to personally when they do not have to write "for the teacher." This activity can encourage students to think critically about their opinions and about what they have learned. They will have to judge the information they have gathered and draw conclusions based on solid evidence. \(^{28}\)
Strategy 10: Collaborative Grouping/Cooperative Learning

So much has been said in recent years about collaboration and cooperation for learning that the benefits seem obvious. For most of us experiences with collaboration clearly demonstrate that the collective pooling and interplay of information, perspectives, and insights can result in greater and more significant learning. The product of the whole group is typically greater than the sum of its parts. There is value added for everyone.

Attributes and characteristics of cooperative learning are excerpted from several sources.

• Cooperative learning . . . provides for diversity and individuality in learning styles and aids students in the socialization process. Paired and group activities promote student interaction and decrease the anxiety many students feel when they must perform alone for the teacher in front of the class. It is important for each student in the group to have a task which he or she may accomplish and thus contribute to the activity (e.g., by being recorder, final copy scribe, illustrator, materials collector, reporter). The ideal size for these groups ranges from 2 to 5 students. Special consideration should be given to students whose home culture may make them feel uncomfortable participating in cooperative learning activities. While all students should be invited to participate, the teacher should respect the wishes of any student who prefers not to participate.29

• Cooperative learning in group situations [can] minimize unproductive competition and the isolation of individuals . . . . Working together in activities not only promotes learning in history-social science but also enhances the acquisition of language and strengthens participatory skills.30

• Bilingual students can be encouraged to meet and review, share and discuss understandings in their primary languages when helpful. Students benefit from developing their note-taking skills and from discussing, in small groups, what they understood from the information presented to the class.31

• Information gap . . . activities, which include jigsaws, problem-solving, and simulations, are set up so each student (in a class, or more generally, in a group) has one or two pieces of information needed to solve the puzzle but not all the necessary information. Students must work together, sharing information while practicing their language, negotiating, and critical thinking skills.32
• [Use] Focus Trios. Before a video, lecture, or reading, divide students into groups of three and have students summarize together what they already know about the subject and generate questions they may have. Afterwards, the trios answer questions, discuss new information, and formulate new questions.33

• [In] Problem Solvers [each group has a] problem to solve. Each student in the group must contribute to part of the solution. Groups can decide who does what, but they must show how all members contributed. Alternatively, they can reach a decision or solution together, but each must be able independently to explain how to solve the problem.35

• In a jigsaw activity, each person reads and studies part of a selection, then teaches what he or she has learned to the other members of the group. Each then quizzes the group members until satisfied that everyone knows his or her part thoroughly.34

The following jigsaw activity is an example of a cooperative experience that could be created at almost any grade level or topical area.

Jigsaw 36

Technique:
A topic is assigned by the teacher and divided into pieces or parts among individual students or groups. Students share and bring the pieces together.

Suggested Activities:
1. Teachers (students can help) create the engaging problem.
2. Students use the research process to explore their assigned part.
3. Students report back to their group to share and extend their knowledge.
4. Entire group participates in a culminating experience to discern patterns and trends across the pieces.
5. As a whole group, students communicate and present their knowledge as an exhibition, a written paper, a video, a multimedia project, a science fair project, a history-day project, a world wide web page, etc.

Expectations:
1. Students working on an engaging problem are interested learners.
2. Students learn to work effectively as a group in a facilitated learning environment.
3. Peer groups develop social skills and behaviors.
4. Students build self esteem and become empowered as they share in groups.
5. Students become responsible for teaching information to others.
6. Students realize that the whole is greater than the sum of its parts.

**Assessment Strategies:**

1. Quality is more important than quantity or glitz.
2. Students are on task as the project develops.
3. Students communicate effectively in the chosen format.
4. Knowledge is applied to real world problems.
5. The culminating activity creates a complete picture of the puzzle.
6. Students excel on content-based tests.

**Information Literacy Strategies:**

1. Students focus on the problem within their assigned topic.
2. Students recognize a need for more information and are able to locate a wide variety of appropriate and applicable resources.
3. Students think critically about what they read, view, and hear.
4. Students use a wide variety of information to draw conclusions and synthesis of their ideas.
5. Students link what they already know with a variety of new information sources.
6. Students communicate their ideas to others in a way that contributes to the whole.
Strategy 11: Tapping the Multiple Intelligences

Student learning styles should influence the types of resources used and the final presentation of the synthesized information. Howard Gardener has identified seven intelligences, which in combination affect an individual’s thinking and learning styles. David Lazear has assembled a Multiple Intelligences Toolbox of creative strategies. Any of these strategies might be used to engage learners in developing information literacy.

<table>
<thead>
<tr>
<th>VERBAL/LINGUISTIC</th>
<th>LOGICAL/MATHEMATICAL</th>
<th>VISUAL/SPATIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Reading</td>
<td>- Abstract Symbols/Formulas</td>
<td>- Guided imagery</td>
</tr>
<tr>
<td>- Vocabulary</td>
<td>- Outlining</td>
<td>- Active Imagination</td>
</tr>
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<td>- Formal Speech</td>
<td>- Graphic Organizers</td>
<td>- Color Schemes</td>
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<tr>
<td>- Journal/Diary Keeping</td>
<td>- Number Sequences</td>
<td>- Patterns/Designs</td>
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<td>- Creative Writing</td>
<td>- Calculation</td>
<td>- Painting</td>
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<td>- Poetry</td>
<td>- Deciphering Codes</td>
<td>- Drawing</td>
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<td>- Verbal Debate</td>
<td>- Pattern Games</td>
<td>- Pictures</td>
</tr>
<tr>
<td>- Storytelling</td>
<td>- Forcing Relationships</td>
<td>- Mind-Mapping</td>
</tr>
<tr>
<td>- Impromptu Speaking</td>
<td>- Syllogisms</td>
<td>- Pretending</td>
</tr>
<tr>
<td>- Humor/Jokes</td>
<td>- Problem Solving</td>
<td>- Sculpture</td>
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</tbody>
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<th>MUSICAL/RHYTHMIC</th>
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<tbody>
<tr>
<td>- Rhythmic Patterns</td>
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<td>- Vocal Sounds/Tones</td>
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<td>- Music Composition/Creation</td>
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<td>- Percussion Vibrations</td>
<td></td>
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</tr>
<tr>
<td>- Humming</td>
<td></td>
<td></td>
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<tr>
<td>- Environmental Sounds</td>
<td></td>
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<td>- Instrumental Sounds</td>
<td></td>
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<tr>
<td>- Singing</td>
<td></td>
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<td>- Tonal Patterns</td>
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<td>- Music Performance</td>
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<th>INTRAPERSONAL</th>
<th>INTERPERSONAL</th>
<th>BODY/KINESTHETIC</th>
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<tr>
<td>- Silent Reflection Methods</td>
<td>- Giving Feedback</td>
<td>- Folk/Creative Dance</td>
</tr>
<tr>
<td>- Metacognition Techniques</td>
<td>- Intuiting Other’s Feelings</td>
<td>- Role Playing</td>
</tr>
<tr>
<td>- Thinking Strategies</td>
<td>- Cooperative Learning Strategies</td>
<td>- Physical Gestures</td>
</tr>
<tr>
<td>- Emotional Processing</td>
<td>- Person-to-Person Communication</td>
<td>- Drama</td>
</tr>
<tr>
<td>- “Know Thyself” Procedures</td>
<td>- Empathy Practices</td>
<td>- Martial Arts</td>
</tr>
<tr>
<td>- Mindfulness Practices</td>
<td>- Division of Labor</td>
<td>- Body Language</td>
</tr>
<tr>
<td>- Focusing/Concentrating Skills</td>
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<td>- Physical Exercise</td>
</tr>
<tr>
<td>- Higher-Order Reasoning</td>
<td>- Collaboration Skills</td>
<td>- Mime</td>
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<td>- Complex Guided Imagery</td>
<td>- Receiving Feedback</td>
<td>- Inventing</td>
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<tr>
<td>- “Centering” Practices</td>
<td>- Sensing Other’s Motives</td>
<td>- Sports Games</td>
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Strategy 12: Specially Designed Academic Instruction In English (SDAIE)

SDAIE is an abbreviation resulting from the development of new terminology and standards for instructional methodologies used with English learners. It refers to Specially Designed Academic Instruction in English and replaces the term sheltered English.

English learners have the opportunity to become information literate in both their primary language and English. Sheltered English instruction (SDAIE) is a combination of instructional strategies that can contribute to the development of information literacy in a student’s second language. Sheltered instruction is “designed to make academically rigorous subject matter understandable to second-language speakers at intermediate fluency or above. This is usually done by teaching new concepts in context and providing additional linguistic clues. Many of the teaching techniques geared to provide comprehensible input in the second-language classroom are now being used by content teachers.”

Print resources can be useful in supporting English language learning if they have high readability, illustrations that are integral to the text, rich content that supports common curriculum, highlighted vocabulary, and are engaging to the reader. In the section below, Dr. Alfredo Schifini identifies the key concepts of SDAIE. When these concepts are translated into teacher and learner behaviors, they are directly applicable to the development of information literacy.

Cornerstones of Sheltered Instruction

Comprehensible Input
This is a construct first articulated by Stephen Krashen to describe understandable and meaningful language directed at people acquiring a second language. Krashen has characterized “comprehensible second language input” as language which the second language acquirer already knows (1) plus a range of new language (1+1) which is made comprehensible in formal schooling contexts by the use of certain planned strategies.

Among these strategies are: (a) focus on communicating a meaningful message rather than focus on language forms; (b) frequent use of concrete contextual referents such as visuals, props, graphics, and realia; (c) lack of restriction on the use of the primary language by the second language acquirers; (d) careful grouping practices, such as the use of cooperative learning; (e) minimal overt language form correction by the teaching staff; and (f) establishment of positive and motivating learning environments.

Prior Knowledge
This seems to be the single most important indicator of academic success for
language minority students. Concept development and comprehension both depend and build upon a student’s prior knowledge: what he or she already knows, understands, and believes about the world and how it operates. Determining the extent and nature of a student’s prior knowledge is essential for a teacher because if a student does not possess the appropriate knowledge required for a particular lesson or activity, he or she will not be able to succeed at that lesson or activity. Once we know what our students already know, then we can determine if a gap exists between what they know and what they need to know to undertake a specific task. If such a gap does exist, teachers must fill that gap, and provide the requisite prior knowledge so that both the teachers and students can then build on that critical foundation. A note of caution: prior knowledge is dependent on a variety of socioeconomic, cultural, and linguistic factors.

Contextualization

Based on recent empirical research, we know that it is not necessary to simplify oral or written language in order for students to understand important concepts. What is necessary is to contextualize that language. This means that we surround difficult or new vocabulary or grammatical structures or ideas with such things as informal definitions, repetition, paraphrasing, examples, comparisons, contrasts, extended description, synonyms, and antonyms.

The advantage of doing this as opposed to simplifying language is that when we contextualize language we still expose students to the complex and rich vocabulary and grammatical structures and ideas that we want them to eventually acquire. If we only simplify, students will never have complex structures modeled for them. Examples of contextualization in the classroom include: visual support, diagrams, charts, student center tasks, cooperative activities, manipulatives, and props.

Negotiation for Meaning

Negotiation for meaning, a key characteristic of communicative interaction, facilitates and promotes both language acquisition and cognitive development. It occurs when participants find themselves in situations where they have a vested interest in understanding messages and having their own messages understood. In these situations, where they must interact linguistically, they naturally do all sorts of things to facilitate comprehension: explain, repeat, expand, paraphrase, pause, question, etc.

In order for negotiation of meaning to occur, however, there must exist both (a) a focus on task (there is something specific to do, to accomplish): and (b) informational equality (all the participants have a need to share information, to interact, because no one participant has all the necessary information to complete the task). Rather, each participant has information that the others need if they are to accomplish their task. In a classroom, negotiation for meaning can be
achieved through role planning, problem solving, activities where students create products, cooperative learning, and paired skill building.39

Designing the Mix for English Learners
SDAIE, as well as all other instructional strategies used with English learners must lead to:

- Academic success,
- Development of information literacy, and
- Implementation of curriculum.

Research and experience confirm what program guidelines and current curriculum documents recommend as language delivery modes that lead to success for these learners:

- English language development (ELD),
- Content area instruction in the primary language,
- Specially Designed Academic Instruction in English (SDAIE), and
- Mainstream English.

In addition, approaches that foster positive self-image and cross-cultural development should be incorporated for all students.
Instructional Planning Checklist

How can the curricular planning team use the strategies identified in this chapter to facilitate planning? Try the following checklist as you review the planning process:

1. Review the sampling of instructional strategies covered in chapter 6:
   - Strategy 1: Writing/Keeping a Journal
   - Strategy 2: Challenging Learners as They Develop Questions and Pose Problems
   - Strategy 3: Tapping Prior Knowledge
   - Strategy 4: Building Background
   - Strategy 5: Using Graphic Organizers
   - Strategy 6: Guiding Students Into, Through, and Beyond Learning Resources
   - Strategy 7: Developing Effective Searches
   - Strategy 8: I-Search: Personalizing a Research Project/Paper
   - Strategy 9: Establishing Audience
   - Strategy 10: Collaborative Grouping/Cooperative Learning
   - Strategy 11: Tapping the Multiple Intelligences
   - Strategy 12: Specifically Designed Academic Instruction in English (SDAIE)

2. Consider how these strategies might be used to help students:
   - Access information,
   - Evaluate information, and
   - Use/generate information.

3. Use the Instructional Planning Matrix on the following page to plot possible ways to engage all learners in your classroom and promote their information literacy while implementing curriculum and achieving desired outcomes.
Instructional Planning Matrix

Curricular Area

Framework Concept or Theme

Language Proficiency of Learners

Project/Learning Outcome

Strategy Mix:
In designing your curricular unit, determine and check (√) the instructional strategies you will use to help your students access, evaluate, and use or generate information. Add codes as appropriate to indicate the language delivery modes that will best support your students’ needs. English Language Development (ELD); Primary Language (PL); Specially Designed Academic Instruction in English (SDAIE); Mainstream English Instruction (MEI). Show where you will incorporate approaches that foster positive images of self and others and cross-cultural development (I/C) for all students.

<table>
<thead>
<tr>
<th>Instructional Strategies</th>
<th>Access information</th>
<th>Evaluate information</th>
<th>Use/ generate information</th>
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<td>Writing/Keeping a Journal</td>
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<td>Specifically Designed Academic Instruction in English (SDAIE)</td>
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34. Ibid.
35. Ibid.
40. “A Guide for Curricular Planning” in Appendix B is an additional resource for the instructional planning team to create effective lessons for all students.
Search Scenarios

The essence of the search process is the ability to recognize a problem, analyze it, and then act to resolve it. The scenarios that follow describe situations, both curricular and personal, in which students are involved in a search process. They are intended to illustrate a sampling of the infinite variety of ways in which groups and individuals might think and respond in problem-solving situations.

The scenarios follow students and teachers as they:

• Identify – or stumble onto – a problem or question that requires a search for information.
• Work collaboratively to accomplish their task.
• Use a wide variety of resources that include people, places, print, and technology.
• Extend their searches beyond school to homes, communities, and other worlds.
• Reflect and assess what they have learned from the search process.
• Use the combination of languages most appropriate for their needs in accessing, evaluating, and presenting or applying information.

1. Owl in Distress

Scenario

The tank trucks leave a thick layer of black tarry road oil on a dirt road. The two families in the cabins on either side of the road have been warned to leave their cars beyond where the oiling would take place and not to walk on it for 24 hours. The next morning Allie and Robert, nine and seven-year-old weekend visitors, go out to look at the road and find a bird mired, covered with tar, and exhausted.

Explore/identify the need for information. This bird looks half dead. Can we save it? Who can tell us what we need to do? What kind of bird is it?

Identify potential resources. Their father, an avid city-dweller, has no idea of what to do, but recognizes the need to do something quickly. Don, the man across the street, lives here all the time and might have some better idea of how to care for ailing wildlife. They could also look in the phone book for the number of a veterinarian, or some public service agency for animals.

Develop general search strategies to refine the question. Going back to the cabin and looking in the phone book would take time. They decide to go and get Don and take him to the bird while Allie runs to get some newspaper to wrap the bird.
Locate and explore resources; select specific resources and formulate search strategies for using them. The children’s father, has an idea to use paint thinner, but before they try it, Don suggests they call a veterinarian and see what he says. Better to take the time than make a fatal mistake.

Locate, analyze, and select information needed. They look in the phone book for some government agency that might help, like a department of animal control, but find nothing under state or county. They try the Humane Society, but there is no answer because it is a weekend. Finally, they try one of the veterinarians listed.

Evaluate information retrieved; determine relevance. Don thinks that since it is petroleum they ought to try detergent, and the vet agrees. Paint thinner would be toxic and damage the bird’s skin. He tells them the bird will be very dehydrated and to try to give it water with an eyedropper. He also tells them to keep it warm.

Determine how to use information. They put some warm water in a tub with detergent and begin sponging the bird repeatedly. Its big yellow eyes are all that they have been able to see as proof of life, as they open and close. They can feel its heart beat. After uncounted washings, most of the oil is gone, but the bird is very weak and just lies in the box they have prepared. They begin to give the bird water with the eyedropper and it tries to drink.

Evaluate results; evaluate process. The bird survives and after a while stands on Don’s gloved hand. It has talons, beak, and big round eyes. It makes a clicking noise with its beak and moves its head from side to side as it looks at its benefactors. It must be an owl. What kind is it?

Identify potential resources. They look in the indexes of their bird books under owls. There are many different kinds, but the only one that seems to match their bird in size is the pygmy owl. Later that day, when they go into town for groceries, they find a book in the library about a pygmy owl, called Owl by William Service (Knopf, 1969).

Locate, analyze, select information, evaluate information retrieved, determine relevance, determine how to use. Don checks the book out on his library card; the book is not only interesting and funny, but also contains a great deal of information about how to care for and feed the feisty, determined bird they have found and befriended.
2. How Much Should We Charge?

Scenario

As a fund-raising project to get additional computer software, the class decided to sell cans of nuts that a parent offered to provide at a discount.

Explore/identify the need for information. To give the students background in fund-raising, the teacher showed “To Buy or Not to Buy,” from the ITV series Trade Offs. This program presented students with such concepts as what happens when your price is too high for the market and how competition can limit your sales.

Formulate the questions. As a follow-up to the video, students were organized into teams to determine what price would sell the most cans and give the greatest profit.

Identify potential resources. Students identified tasks to provide them with information. These were: (1) contacting another class with experience in fund-raising, (2) surveying newspaper ads and store price surveys, (3) checking the library for books and magazines that might have techniques for organizing selling, and developing a market survey (as suggested in the videotaping).

Locate and explore resources; develop general search strategies to refine the questions. Teams developed strategies for each task group. They identified key words to expedite their library and online search of books, periodicals, and company web sites, e.g., sales, marketing, competition, pricing, fund raising, marketing surveys. They developed a list of questions to use in contacting other fund-raising groups, designed a check sheet to compare current prices, and designed a survey sheet to determine the market for their product. They used the computer software program called “Hot Dog Stand”(in Survival Math by Sunburst) which introduced additional variables to consider when setting a price.

Evaluate information retrieved; determine relevance. After using these instruments to obtain the necessary information, a decision was made on the price that would give them the highest profit per can. Students test-marketed for one week and discovered sales were slower than they had anticipated. After reviewing the situation, they lowered the price per can and sales increased.
3. Relating Literature to Life

Scenario

After reading So Far From the Bamboo Grove by Kawashima Watkins (Lothrop), an autobiographical novel about the flight of two Japanese daughters and their mother from Korea to Kyoto, Japan at the end of World War II, Mrs. Thompson decided that reading books like this would be one way to make World War II come alive for the students in her 9th grade world history class.

Explore/identify the need for information; Identify potential resources.
Mrs. Thompson planned to use the “into, through, beyond” approach to the teaching of literature. With the help of other teachers and the librarians in the school and public libraries, a good sized list of books having to do with ordinary, non-military people during World War II was compiled.

To set the tone, she would read aloud two serious and moving picture books about children in Japan and Europe during the war. Hiroshima No Pika by Toshi Maruke (Lothrop) and Rose Blanche by Innocenti (Stewart Tabori & Chang). After a general class discussion about war and its consequences for ordinary people and innocent bystanders, she would distribute a list of related books and comment on each of them. Each student would choose a book to read.

Locate, analyze, and select information needed. She would ask them to keep dialectical journals (comments on specific, self-chosen, portions of the text) while reading their books, keeping in mind the written and oral project they would do when finished.

Evaluate information retrieved; determine relevance. Hoping for questions and ideas provoked by their reading and dialectical journals, she would ask for a short research report that would attempt to answer their most pressing questions. She knew that for many of them that would be difficult, but with the help of the school and public librarians who had also read many of the books, she hoped to be able to help them focus on important ideas. Interviews with people who lived during the time of the story, who served in the armed forces in World War II, or those in the community familiar with the customs and philosophy of the people and country involved would be valuable. Online visits to web sites highlighting World War II and its aftermath would add to the students’ resource base.

Identify valuable resources. To obtain information on their selected topic, students brainstormed lists of potential resources similar to the following:

- People who lived in Japan, Germany, etc. during the time of the story
- People who served in the armed forces during World War II
People in the community familiar with the customs and philosophy of various ethnic groups
- School and public libraries and museums
- Embassies
- Online databases, mailing lists, and usenet newsgroups

**Develop general search strategies to refine questions.** Four forms of exploration were chosen:
- Students prepared questions for interviews of selected community members and learned interview techniques.
- Students wrote letters of inquiry to embassies.
- Teacher and students met with the librarian to plan further research.
- Students researched web sites and looked for further people contacts.

**Select specific resources and formulate search strategies for using them; locate, analyze, and select information needed; evaluate information retrieved; determine relevance.** Working in pairs in the library media center, students selected appropriate materials from library resources and recorded pertinent information. Those students on interview teams arranged and recorded information from interviews. Useful responses from embassies were selected.

**Determine how to use/present/communicate information.** The drama of what they read, combined with the interviews they held with community members, inspired many with the desire to simulate oral interviews with the characters in their novels and biographies. They felt this would be an effective way of sharing with other students their own intense experiences.

**Evaluate results; evaluate process.** So, what is worthwhile about reading books like *So Far From the Bamboo Grove*? The vividness of the experiences, the reality of the characters, the recreation of a period of history in a vital personal way. The project seemed to be a general success. The difficult part was the one Mrs. Thompson anticipated: getting at the ideas, themes, and questions of each novel. Some succeeded better than others, of course, but all who participated came away with a more intense awareness of the lives of people during World War II, and that was the purpose of the project.

### 4. Where Do I Begin?

**Scenario**

Mr. Marker is a creative social studies teacher who gives students choices about assignments. He alerted me that he was sending Robbie, an eighth grader, for help with a pending oral exam on the Vietnam War, a topic that seemed to be swallowing him with its complexities.
Explore/identify the need for information.

“Mr. Marker sent me up here to get a book about the Vietnam War,” Robbie said.

“Do you just need a little information, or are you going to write a report, or what?” I asked.

“Well, it’s 10% of my grade and I have to know everything ... how we got in, how we got out, and what happened after.”

“Are you going to write something?”

“No, he’s going to ask me a bunch of questions. When he asked this other guy questions and he answered right, Mr. Marker said he’d showed he’d read a book. So I need a book.”

“What do you know about it already? Do you know when it began or ended?”

“I know when it ended ... 1973 ... I think. I figure if I read a book about it, I’ll find out everything.”

“Do you have time to talk about it? Maybe I can help you get started. ‘Let’s sit down and see if we can make a plan, figure out a strategy so you can do a really good job and get full credit. Where do you think a good place to begin would be?’”

“The computer catalog? To find a book about it? I think a book would be proof that I’d done some work on it ... to back up my answers.”

“How about getting some basic information about the whole war? Do you think that’s a good idea?”

“No, I think I just need a book.”

“Well the bad news is that the ninth graders have been here ahead of you, and I don’t think there’s one book left here or at the public library. Do you have a lot of time before you have your oral exam?”

He did have plenty of time so I set out to convince him that he needed a plan of action, that possibly reading a book wouldn’t be enough. If the book were too old, it wouldn’t tell him as much as he needed to know. It might be one sided. He might need to read more books than he had time for.

Formulate questions. Between us, we brainstormed what he knew and I added a few ideas. While we talked, I showed him how to cluster these ideas. As we
did it, he began to indicate that there was a lot he would need to know, more than he thought.

**Identify potential resources.** We talked about some resources he might use to find out something such as a print or electronic encyclopedia, an atlas, maybe some biographical dictionaries, books, periodicals and online databases. He thought he might be able to talk to some people who might have information. Maybe he would see some movies, like *Platoon* and *Hanoi Hilton* too.

**Develop general search strategies to refine the questions.**

“And what will you look under in the reference books?”

“Vietnam War.” He looked at me as if to say, what else?

“Let’s look and see.”

When we did, we came up with some synonyms and allied subjects, e.g., Vietnam, Vietnamese Conflict. In *World Almanac* alone, we found 26 possible topics to research. *World Book Encyclopedia*, with back-to-back articles on the country and the war, provided dozens more. While he could see that *World Book* told more than he needed, it provided a good background. He felt he would need to memorize a good bit of material to answer Mr. Marker’s questions.

“What kind of questions will he ask you?” I asked. Robbie really didn’t know if he had to have names, dates, statistics, battles, places memorized. He realized it would be important to know that before he went too far.
Locate and explore resources. Looking at it laid out in the almanac and encyclopedia made it seem less formidable. Now when he did read his books (when the ninth graders finally returned them) he would have a better idea of what was important to know. Finding out Mr. Marker’s expectations would help too.

Robbie learned about a variety of resources including Newsbank, Facts on File, and some biographical dictionaries he had not used before. He was really pleased to learn that when he searched some sources on CD-ROM, he was able to print out the full text of articles or other material he was looking for. He also became reacquainted with some old standbys he knew at least by sight ... almanacs, encyclopedias, atlases, the vertical file, and the dictionary. He listed the other places and people who could help him: the public library, relatives, and perhaps the veterans organizations.

Select specific resources and formulate search strategies for using them. After he talked to Mr. Marker, he found out that there were some facts he would have to memorize, but not as many as he thought. He now knew what to concentrate on, what questions were important, and how to go about finding the answers.

- How and when did the U.S. get involved in the Vietnam War?
- When did they get out? When did the war end?
- What was the outcome? the aftermath?
  - for South Vietnam, North Vietnam?
  - for the refugees?
  - for the veterans, prisoners, MIAs?
  - for the United States?
  - for China, Thailand, Kampuchea (Cambodia), etc.?

The resources he chose to use included:

- The World Almanac
- World Book Encyclopedia
- Atlas
- Magazine Article Summaries
- Facts on File
- Various trade books
- Interview with relative who is a veteran

Evaluate results; evaluate process. Robbie discovered that beginning with the World Almanac, which became his framework, everything he read filled in and fleshed out what he knew. By the time he finished reading, gathering, and discarding data, he had a good grasp on the background and outcome of the Vietnam War. His oral presentation and exam by Mr. Marker, in front of the rest of his class, were well received by teacher and students. He more than earned the final 10% of his grade.
5. Waste Disposal Plant

Scenario

Students in an industrial technology class at Anytown High School in Anytown, U.S.A., were quite concerned about the arguments in the newspaper regarding the waste disposal plant to be located one mile from their community. Arguments in favor of the location of the plant included: 1) the land was already owned by the city; 2) the local dump was near capacity, 3) the closest residential area was at least a mile away; and 4) the plant, which would incinerate solid waste, was expected to create 250 much needed jobs in the community. The arguments against the location were: 1) although the plant was a mile from their community, prevailing winds would blow the pollution directly at it; and 2) the design for the plant did not include technology for the maximum efficiency, and there would be more air pollution than necessary. A hearing before the city council was scheduled for the next month with several strategy planning meetings in the community before. The students thought if they could submit a design that might improve the efficiency of the plant, maybe everyone would win.

Explore/identify the need for information. The students needed to access the plans for the proposed waste disposal plant. They needed a copy of the environmental impact study. They wanted to review all the public discussion that had occurred to date. They needed to understand how other communities had dealt with the problem of solid waste disposal.

Formulate questions. What have people in our community and other communities said and/or written about solid waste disposal? What are the pros and cons of the type of plant currently under consideration? How have other communities dealt with the air pollution question?

Relate the question to prior knowledge. The teacher encouraged the students to keep logs on their discussions while working on the project in order to document where they went for information, their thoughts about the project, and any other relevant items. The students first brainstormed everything they knew about waste disposal. They listed all the reasons they could think of for and against the incinerator method. They suggested other ways of disposing of the trash from their community and discussed the feasibility of these methods.

Identify potential resources. Potential resources for background on solid waste disposal were reference books, magazines, newspapers, and indexes (hard copy and electronic) for these materials. The city planning office might be able to provide them with copies of the environmental impact study and plans for the waste disposal plant.
Develop general search strategies to refine the questions. The students asked the library media specialist for assistance when they could not find everything they needed in the library catalog and periodical indexes. He helped them use Sears’ List of Subject Headings and the Library of Congress List of Subject Headings to isolate appropriate subject headings to search under. He also helped them select a full-text newspaper database and Pollution Abstracts from Dialog Information Services for local and general information on waste management. The library media center also had a subscription to Biology Digest, an index with abstracts of articles in popular and scientific magazines on all types of scientific subjects. A call to the city planning office helped them find out how to obtain the reports they wanted.

Locate, analyze, and select information needed. Several newspapers across the country had articles on problems that were similar to those of Anytown. The students were able to understand the arguments for and against the type of waste disposal plant suggested for their area. Starting with popular magazines’ treatments of the problem and working up to the scientific magazines’ discussions helped the students see that there were other alternatives to the type of plant that had been proposed. Information about the wind patterns in their area also enabled them to suggest a different orientation of the exhaust mechanism that would minimize the amount of air pollution coming into the community.

Analyze information retrieved; determine its relevance. The students found information about how communities similar to theirs handled the problem. They found different ways to construct waste disposal plants.

Determine how to communicate information. The students wrote a careful report citing facts and figures describing all the pros and cons they were able to find about solid waste disposal plants, air and other types of pollution emanating from the operation, and how to minimize the negative effects of such an operation. They presented their figures using slides produced by a computer program. Using their computer-aided drafting (CAD) skills, they drew plans for another plant, making changes they thought would help both sides of the conflict come to a resolution. They applied for and were granted time to make their presentation orally at the community hearing before the City Council.

Evaluate results; evaluate process. The students’ presentation was well-received. In reviewing their logs, they were surprised to see how much they had learned.
6. Brainstorming Resources

Scenario

Sandy Schuckett, a library media specialist in a Los Angeles, California school with a majority of English learners, wanted to explore what sources of information her students were aware of or were already using. She and the classroom teacher generated a list of questions that they thought would engage students’ thinking.

Identify potential resources. Sandy organized the students into collaborative groups to brainstorm the answers to the questions. Here are Sandy’s comments:

Before we dealt with the “engaging questions,” I asked them generally where they would go to find information. Their answers were books, dictionary, library, encyclopedia, newspaper, TV, phone, radio, friends, teachers, police, family, scientists, doctors…. I thought that was a good range of sources before we even got into any kind of discussion about finding information. Once they got their questions, it was interesting to note that even though this was a relatively advanced ESL class, they did all of the discussion with their partners in Spanish! However, they wrote out their lists in English. I decided to repeat the same activity again with an intermediate level ESL class, totally in Spanish — sort of a “control group.” I followed exactly the same procedure as with the previous class.

Following are some of the situations Sandy posed and student responses about where they would go to find information.

• You have written some stories, and your ESL teacher tells you that they are very good and that you should try to get them published.

Bookstore, library, teacher, publisher’s office. (I thought this was pretty astute! I’ve had adults ask me this same question without even a clue of the answer!)

• You are going to baby-sit for your neighbor. It is the first time you will actually be paid for doing this, and you want to do the best possible job.


• Someone in your best friend’s family has a terrible disease, and she is worried that it might be hereditary and that she might get it too.
Hospital, doctor, enfermero/enfermera, clínica, gente grande, farmacéutico, curandera.
(The hospital, doctor, nurse, doctor's office, grownups, pharmacy, folkhealer.)

• You and your friends want to start a drama club and put on a play.

Periódicos, la guía telefónica, revistas, televisión, libros, radio, adultos, amigos, famil -

Select the most useful resources for further exploration; evaluate results.
Sandy confirmed for herself and her students that they were already familiar
with many valid sources of information. She and their teacher would collabor -
rate on appropriate next steps for helping them to explore these resources and
and to identify useful resources beyond these familiar ones.

7. Picturing Histor y

Joyce Roth, in her work with the California History-Social Science Project,
demonstrates to teachers how photographs can be used as primary sources to
reveal extensive information. She suggests the following as a scenario for help -
ing students to think more deeply about the lives of people during the Gold
Rush:

In the 1840’s, gold was discovered in the hills of what later became California.
Many men left their families and migrated westward seeking fortunes. Why did
a majority of men come alone? For clues, look at photos of miners on location.
Questions that you might want to ask are . . .

Where is this place? How would you describe the landscape? Is this place flat or
mountainous, dry or wet? What natural features do you see? How has the envi -
ronment been touched by humans? Are there buildings? If so, what kinds and
for what purposes? How does one travel to, from, and in this region?

Now that you have analyzed the photo once or twice, why do you think most
men came alone or with other men to the gold fields? Put yourself in this photo.
How would you be living? Describe your feelings. Suppose you were the miner
there alone.

Now think of other questions that you have. Write them in your journal. Refer
back to them and continually add to them.

Compare pictures of this region with those of life in the East during the same
time period. Use a Venn diagram to record notes about characteristics of life at
that time that are similar and dissimilar.
We can see that the land plays a significant role in determining the historical story. Based upon your research using photos, how do you think life changed for many children during the gold rush?

What other resources should you gather and use to expand your view? Remember that one photo provides only one picture of the way things were. Many photos will allow you to make some assumptions; adding excerpts from diaries, tapes of oral interviews, and investigating artifacts will further clarify the authenticity of your ideas.

Based upon your conclusions, support or refute this statement: “Miners were greedy people.”

8. Identifying an Audience and a Reason to Write

English-as-second-language (ESL) students have a wealth of experiences to share with native English speakers. One of the most interesting and most immediate experiences they can draw on and translate into a narrative is the story of their departure or their parents’ departure from their homeland and their journey to the United States.

At the prewriting stage we have a discussion about these students’ experiences. Many of them have traveled extensively, seen other parts of the world, lived in cultures with different customs, and so forth. I point out to the ESL students that many Americans would love to meet and talk with them and find out where they came from because most Americans have little information about their country’s most recent immigrants.

As a prewriting exercise, I tell the students that a whole book has been written about immigrants traveling to the United States; their experiences are also worth sharing. I then read a selection from American Dreams: Lost and Found, by Studs Terkel. It is an account of Dora Rosenzweig, a Russian immigrant. Dora’s story becomes the model for my students’ own narrative.

After I read this excerpt from American Dreams, we discuss what Dora said and identify what we think would be interesting to United States citizens. Before we begin to write, I ask for the students’ input about what should be discussed in the narrative in sequential order, and I write their suggestions on the chalkboard. For instance, we begin asking questions that we believe people would most like to have answered:

1. How long ago did this event take place?
2. How did you learn that you would be moving?
3. What was your life like before you left?
4. How did you actually escape or move?
5. With whom did you travel?
6. What was your travel experience like?
7. Were there any problems or exciting experiences?

Next, I tell the students to write only what they feel comfortable with sharing and to give as accurate an account as they can so that their audience can picture their experiences. I also tell them that only I will know the authors’ true identities. To provide some structure for their reminiscences, I ask the students to write about their family life first, followed by their traveling and immigration experiences, and finally how they feel about life in the United States.

Because my students already have a wealth of memories to tap in telling their stories, they can focus less on what they want to say and put their energy into how they will say it. Providing an interested audience for them – a classmate at school, new neighbor, supportive teacher – and a topic they have deep feelings about motivates them to communicate as clearly and descriptively as they are able. Once they relate their experiences on paper in this new language, they can read them aloud in small groups or work individually with the teacher to make any necessary corrections.

9. Sharing Languages and Organizing Data

Scenario

In Mr. Martinez’s fifth-grade class, most of the students are native Spanish speakers who are learning English as the other students in the class are learning Spanish. The class meets once a week for conversation with a high school Spanish class, an opportunity for mutual help and enjoyment in acquiring each other’s languages.

As part of their science curriculum, the fifth-grade students have been engaged in some interesting activities designed to help them to expand their understanding of the concept of data analysis and appreciate its value in the scientific process. Since many of the students have pets, they decide to create a simple database with as much information as they can gather about their pets. In this way they will be able to sort and display their data. They also decide to invite their high school partners to participate in this project. The high school students can contribute data about their own pets, thereby providing more data to use and compare.

First, students work in small groups to decide what fields should be included in the pet database. Obvious fields are student’s name, pet’s name, animal species, age of pet, height and weight of pet, color, food the pet eats, housing (cage, box, kennel, and so forth), and distinguishing characteristics, such as number of legs or the sounds the pet makes. The field names are in both English and Spanish, with data being entered in either language, or both.
During a meeting with their high school partners, students begin to ask additional questions about their pets. What breed of animal is it? In what country did this breed of animal originate? Has this pet ever played a role as a helper to humans? This activity sets the pattern for gathering and using data. Students comb their communities for information and interview their families and friends. It becomes a challenge to see who can find a new and fascinating fact about a chosen pet.

The library media specialist works with the classroom teacher to guide students through their research process. Students identify key words and create a web for each category of pets. In a jigsaw, students begin to explore specific library resources for information on pets and then report what they found in English and Spanish encyclopedias, nonfiction books, magazines, CD-ROM and online sources. Many bring information from both English- and Spanish-language newspapers and magazines from home.

As new information is located, it becomes necessary to revise some database field names and to add several new fields. Students begin to experiment with sorting the data on various fields in the database. They also discover the many different report formats they can print.

As a follow-up to this project, students used the computer word-processing program, The Bilingual Writing Center, to prepare a Spanish-English bilingual book based on the information they gathered. Copies of the book were added to the library collections at each school.

10. Radio DJs: A Constructivist Internet Lesson

Carol Lang, a consultant in Telecommunications and Technology with the Los Angeles County Office of Education, designed the following project to demonstrate to teachers how they might guide students in an open-ended but purposeful use of the Internet for personal decision making.

When using the Internet or any form of technology, gathering new and interesting information and/or resources can lead a student into thinking that “The Answer” has been found. The goal of this lesson is to guide students into learning new ways of thinking, not just learning new facts — concepts, not keystrokes. Learners need to ask themselves, “So what is the value of the information?” “Why is it important?” Teachers need to focus on type of thinking they want the students to accomplish.

This lesson was designed to be fun for students and present a reason for an authentic investigation. It is framed so that specific kinds of thinking (organization, analysis, synthesis, etc.) are required of the students. The format is adapted from Apple Computer’s Unit of Practice model.
The problem:

Your parents are radio DJs in Los Angeles and they have been offered jobs in Buffalo, Ft. Lauderdale, and St. Paul. Since they know that you understand how to use the Internet, they have asked you to work together, conduct research and make recommendation for where your family should relocate.

Family members: Kevin and Mrs. Bean and their children, Alanis, Doug (The Slug), and Cranberry. Alanis has a boyfriend in Los Angeles, and therefore, doesn’t want to move but hates earthquakes. Doug wants to be near the beach and doesn’t like to be where it is cold. Cranberry likes to snowboard. The radio station where your parents have been working has been sold and is becoming an all-classical station. They need a new gig in a new city. Where should they go?

Goal (teacher’s curriculum-design challenge)

To move students from just gathering to assessing and judging information. A lot of raw data is available through the Internet, but it needs to be applied in a meaningful way to solve a problem.

Tasks (nature of student actions)

1. Predict what you think your recommendation might be and why. (Use prior learning.)
2. Decide on a plan of action. (global)
3. What information is available? How much is enough? What’s important?
4. Break the plan into action items. Move from a topic to questions to be answered. (narrow) What are some factors to research? (cost of living, weather, earthquakes, etc.) What’s the best way to get the information? (e-mail to the Chamber of Commerce for tourism information, e-mail to a school and ask for impressions, web browser to collect temperature and rainfall data, gopher to get news articles, etc.) How are you going to organize the information? How are you going to cite references? (database, brochure for each city, advertisement for each city, etc.)
5. Value the items. Do all the factors carry the same weight? What are the priorities? How do you know? (sort in a database, prioritize in a spreadsheet, etc.) How are you going to weigh the factors? (spreadsheet, type size, etc.)
6. Visualize and analyze the information. What trends or problems do you see? (chart, graphs, etc.) Address concerns of the family members. What are the differences and similarities in the children’s and adults’ concerns? (word process their feelings)
7. Consider constraints. Are there any factors that would prevent or discourage them from going to a city? (list, budget, etc.)
8. Be open to other factors. What are their implications?
9. Make a recommendation. Please show the process, factors and rationale used in arriving at your recommendation.

**Assessment (criteria for evaluating students' work)**
- Each member works to the best of his or her ability.
- Steps are completed.
- Complete information is provided.
- A system is devised for assigning values.
- Information is translated into clear, concrete representations.
- Sensitivity is communicated in considering feelings.
- Recommendations are supported by the factors.
- The project is evaluated using self assessment, team assessment, and peer (class) review.

**NOTES**
1. Adapted with permission from a scenario originally developed by Oregon New Standards Project Team for Applied Learning, 1992.
3. Adapted from a lesson published by The California Telemation Project.