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ABSTRACT
         The materials collected in this document were
submitted to a conference focused on issues relevant to Chapter 1
programs. A wide variety of resources was presented to participants.
Resources for teachers related to mathematics cover the topics of
teaching reform; curriculum and instruction; problem solving; and
estimation. Resources on reading involve strategies for teaching
advanced skills; critical and creative thinking; problem solving; and
semantic mapping. Writing resources concern critical thinking skills;
lessons in descriptive writing, the writing of fiction, and letter
writing; problem development and solution; and whole language
philosophy. (BC)

PS

OPTION '90

INTER-TAC INSTITUTE ON CURRICULUM AND INSTRUCTION

RAMADA RENAISSANCE TECHWORLD
Washington, D.C.

March 29-30, 1990

Sponsored by: Chapter 1 Curriculum and Instruction Resource Center
Region B TAC, Advanced Technology, Inc.

CONFERENCE AGENDA

Thursday, March 29

8:30-9:00   "Sweet Strategy" (Continental Breakfast)

                     Welcome (Dr. Beverly Farr, Manager, Curriculum & Instruction
                     Resource Center)

WRITING

9:00-11:45   Dr. Carol Olson (University of California)
(Break at 10:30)
                     "Little Kids Can Think Big: Integrating Listening,
                     Speaking, Reading, Writing and Critical Thinking"

11:45-12:00   Announcements

12:00-1:30   Lunch (on your own)

Afternoon   **MATH**

1:30-4:00   Dr. Douglas Grouws (University of Missouri)
(Break at 3:00)
                     "Developing Mathematical Thinking and
                     Advanced Skills"

                     Lou Emge (Region B TAC)

                     "Teaching Advanced Skills in Chapter 1: Problem Solving
                     and Estimation"

4:00-5:00   Dr. Edys Quellmalz (Region F TAC)

                     "Higher Order Thinking across the Curriculum"

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Individuals Attending Option '90
March 29 and 30, 1990
Washington D.C.

Region A
Hampton, NH
    Wendy Graham
    Larry Rayford
    Karen Schuster
    Bruce Yelton

Region B
Indianapolis, IN
    Mary Quilling
    Rita Uchida

**Curriculum and Instruction
Resource Center Staff**
Indianapolis, IN
    Beverly Farr
    Suzi Peterson
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Region C
Atlanta, GA
    Trudy Bacon
    Johnnie Follins

Region D
Overland Park, KS
    Judy Gouwens

Region E
Denver, CO
    Beatrice Martinez Kinnison
    Rosalee O'Donough

Region F
Mountain View, CA
    Edys Quellmalz
    Dan Zallis

Region 7
Alaska
    Andy Sommer

Region 1
Hampton, NH
    Martha Cray-Andrews
    Colleen Orsburn

Region 2
Indianapolis, IN
    Pamela Terry Godt
    Carol Lotven
    Cora Lea Jarrell

Region 3
Decatur, GA
    Cindy Chandler
    John Toth
    Nancy Yoder

Region 4
Overland Park, KS
    Dianne Seltzer

Region 10
Overland Park, KS
    Theodora Lambson

Region 5
Denver, CO
    Judi Elliot
    Dianna Lawyer-Brook

Region 6
Portland, OR
    Lynde Paule

Region 8
Hawaii
    Teresa Arambula Greenfield

Region 9
Puerto Rico
    Marta Santos

OPTION '90

CURRICULUM AND INSTRUCTION RESOURCE CENTER

MATHEMATICS

Contents:

Jigsaw Activity

A. Groups of 3 to 6 members.

B. Each group member is given a portion of the lesson.

C. Each person studies their portion of the lesson.

D. Each person teaches the other group members that section of the lesson.

One Point of View

Teaching Tomorrow's Skills Responsibly

By Douglas A. Grouws

The educational reform movement will soon affect all school mathematics programs. It is hoped that the substantive changes that occur will reflect carefully developed recommendations, such as those of the NCTM Standards Committee.

The rationale for many of the proposed changes is based in part on two valid observations. First, it is essential that schools prepare students to function effectively in a rapidly changing technological world. In the future, students will need improved problem-solving ability and increased capability to use many new skills, such as mental computation, data gathering, and estimation. These skills are new in the sense that they have not been emphasized previously in the same way that basic computation, for example, has been.

Second, it is important to eliminate some undesirable, yet prevalent, outcomes of current instruction. Presently, too many students cannot, or do not, think deeply and reason as they do mathematics. Often they acquire skills strictly through repetitive practice of step-by-step procedures devoid of meaning and learn to apply algorithms thoughtlessly, basing their choice of computation on key words or other superficial features of problems. Stories about students who choose an operation based on the size of the numbers in the problem or always subtract when they see the word *left* are well known. Lesson content is not organized to offer sufficient opportunity for reasoning and reflection. Too little emphasis is placed on understanding mathematics, and, consequently, students have great difficulty in effectively applying mathematical concepts to new situations. What is needed, then, is reform that results not only in students' acquiring new skills but also in students who are flexible in their thinking (Weaver 1957) and thoughtful in their decision making.

Douglas A. Grouws is professor of mathematics education at the University of Missouri, Columbia, MO 65211. He is active in research on effective mathematics teaching and staff development work.

One Point of View

Teaching Tomorrow's Skills Responsibly

B Douglas A. Grouws

At least four significant, interrelated factors have contributed to the mechanical way in which students currently do mathematics. First, most topics are divided into numerous subtopics, and students are drilled on each subtopic in a separate lesson. Second, insufficient consideration is given to how new ideas relate to previously learned ideas and skills. Third, too much instruction takes place without attention to real-world settings, and fourth, opportunities for discussion of mathematics are too limited. We can readily observe the effects of these factors. For example, in many mathematics classes, *every* student attempts to solve *every* problem considered on that day, using a single method like working backward. In some classes every estimation is made using the same technique, such as rounding. One is hard-pressed to find classes where students use and describe a variety of strategies and consider their relative advantages and disadvantages.

It is essential that curriculum reform avoid this tendency to divide new concepts into component skills and teach them in isolation. Many related skills occur within such ɔ-mains as problem solving, estimation, and mental computation, but they need not be developed separately. For example, making a table, working backward, and guessing and checking are all important component skills of problem solving, whereas rounding, compatible numbers, and front-end strategies are all legitimate components of computational estimation. Yet these subskills need not be taught singly nor mastered the first time they are considered. This kind of teaching leads to rigidity in learning and does nothing to foster flexibility of thinking, multiple approaches to problems, or different schemes for organizing data. It should be avoided.

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One Point of View

Teaching Tomorrow's Skills Responsibly

By Douglas A. Grouws

What is needed is instruction that focuses on development (Good, Grouws, and Ebmeier 1983) and the meaning of ideas, with a goal of achieving diversity of student thought and the use of a variety of solution methods and techniques. This focus should lead to classes in which multiple solution methods are discussed and estimations are made using numerous strategies within a variety of topics. In such classes students acquire and appreciate mathematics through experience rather than through lessons that isolate a particular skill and exclusively emphasize it. The latter assume that students will later learn how and when to apply skills as they are given mixed-practice exercises, but experience suggests that this approach is often unsuccessful. The applicability of ideas must explicitly be considered in initial instruction, or an important opportunity to develop it is lost and an excellent chance to foster creativity and flexibility of thinking is missed.

It is indeed important how curriculum changes, especially curriculum additions, are implemented. It is essential that we as teachers shun the fragmented presentation of new topics treated in isolation from related skills and real-world problems. We must guard against this phenomenon in the curriculum materials we choose, in the tests we use, and especially in our own teaching. This kind of leadership is needed now, the kind of leadership that will insure that we do not retain today's problems when teaching tomorrow's skills.

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THINK-PAIR-SHARE

O   The teacher poses a question or activity to the
    students in the class

O   Students <u>think</u> of a response or work on the
    activity individually for a given period of time

O   Students <u>pair</u> or triple with their partner(s) to
    discuss the question or activity and reach
    consensus

O   The teacher leads a whole-class <u>sharing</u> of
    agreed-upon answers or responses

Transparency

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CURRICULUM AND INSTRUCTION MATHEMATICS ACTIVITY

The following statements are taken from the NCTM Curriculum Standards. They are a mixed list of recommendations, some are areas to receive **increased attention**, others are areas to receive **decreased attention**. For each statement decide whether you feel it is an area for <u>increased</u> (I) or <u>decreased</u> (D) attention in improving mathematics curriculum and instruction.

___ 1. Complex paper-and-pencil computations such as 476 x 729

___ 2. Using clue words, such as "left" always means subtract, to determine the operation in solving story problems

___ 3. Collection and organization of data into graphs and charts

___ 4. Mental computation

___ 5. Teaching by telling--showing how to do an example followed by a set of practice exercises

___ 6. Estimation and the reasonableness of answers

___ 7. Paper and pencil computation with fractions

___ 8. Use of formal rounding methods to estimate

___ 9. Use of everyday problems

___ 10. Primary focus on naming geometric figures

___ 11. Problem-solving approach to instruction

___ 12. Use of calculators for complex computation

___ 13. Thinking strategies for basic facts such as odd times odd is always odd

___ 14. Use of worksheets for computational practice

___ 15. Cooperative problem-solving groups

___ 16. Use of manipulatives

___ 17. Rote memorization of formulas and procedures

___ 18. Practicing problems categorized by types (e.g., coin problems, age problems, distance problems)

___ 19. Problem-solving strategies such as guess and test, draw a picture, or make a chart

___ 20. Place value concepts

KEY and COMMENTS for
CURRICULUM AND INSTRUCTION MATHEMATICS ACTIVITY

The source for most of the following comments is the Curriculum Standards for School Mathematics, prepared by the National Council of Teachers of Mathematics (NCTM).

_D_ 1. Complex paper-and-pencil computations such as 476 x 729

Almost all complex computation today is done using readily available calculators or computers. In daily situations, adults most often compute mentally or make estimates, rather than computing exact answers with paper and pencil.

_D_ 2. Using clue words, such as "left" always means subtract, to determine the operation in solving story problems

Problem solving should be approached through an understanding of the problem and the flexible use of problem-solving strategies. Using clue words as the key to solving problems presents mathematics as tricks to learn.

_I_ 3. Collection and organization of data into graphs and charts

Collecting, organizing, describing, and interpreting data, as well as making decisions and predictions on the basis of the information, are skills that are increasingly important in a society based on technology and communication.

_I_ 4. Mental computation

Mental computation is used much more extensively in everyday life than paper-and-pencil computation, yet very little time is spent on it in school. Children need daily experiences using metal arithmetic and its application in estimating.

_D_ 5. Teaching by telling--showing how to do examples followed by a set of practice exercises

Mathematics instruction must be interactive, allowing students to explore and discover concepts. Teachers should present interesting problem situations whose solution requires certain skills. The teacher acts as a facilitator of learning, rather than a dispenser of knowledge.

_I_ 6. Estimation and the reasonableness of answers

Estimation presents students with another dimension of mathematics; terms such as **about, near, closer to, between,** and **a little less than** illustrate that mathematics involves more than exactness. Skill and understanding of estimation enhance the abilities of children to deal with everyday quantitative situations and promotes number sense.

_D_ 7. Paper and pencil computation with fractions

Computation with fractions presently takes a substantial portion of mathematics instructional time in upper elementary and junior high grades. Much of the tedious computation should be replaced with extended use of manipulatives and estimation activities that build an understanding of the relative size of fractions and what happens when we compute.

_D_ 8. Use of formal rounding methods to estimate

Formal rounding procedures, followed by practice exercises, which are found in most textbooks should be replaced in part with informal procedures. Students should have many opportunities for informal estimation of numbers and quantities which are related to real-life situations.

_I_ 9. Use of everyday problems

Making mathematics come alive and relating it to the lives of our students is an important motivation to learning mathematics. It also helps to activate students' intuitive problem-solving skills, skills that children have, but seldom use at school.

_D_ 10. Primary focus on naming geometric figures

Although facility with the language of geometry is important, it should not be the focus but rather should grow naturally from exploration and experience. In learning geometry, children need to describe, model, draw, and classify shapes which lead to development of spatial sense.

_I_ 11. Problem-solving approach to instruction

The first NCTM Standard at each grade grouping--K-4, 5-8, 9-12--is "Mathematics as Problem Solving." Problem solving is not a distinct topic but a process that should permeate the entire curriculum. Ideally, students should share their thinking and approaches with other students and with the teacher. They should learn several ways of representing problems and use strategies flexibly in solving problems.

_I_ 12. Use of calculators for complex computation

Teaching students to effectively use calculators is important in the technological world in which we live. The use of calculators allows for solving many real-world problems where the numbers are messy. The calculator frees students to concentrate on real problem solving rather than the complex computations that may be required.

_I_ 13. Thinking strategies for basic facts such as odd times odd is always odd

Basic facts must be learned. Using strategies based on things children know helps to build understanding as they learn the facts. If a child knows that 7x7=49 (a number times itself is usually learned quickly), he/she can add on 7 to find 8x7 or subtract 7 to find 6x7.

_D_ 14. Use of worksheets for computational practice

Various studies of educationally deprived children found them completing between 10 and 20 worksheets during an average school day. Students learn best when they are active, rather than passive, learners. Use of interactive teaching strategies, such as cooperative work groups, should be increased.

_I_ 15. Cooperative problem-solving groups

When students work in cooperative groups, the active participation of each student is maximized. Many students feel more comfortable in small-group settings and are more willing to explain their ideas, speculate, question, and respond to the ideas of others.

_I_ 16. Use of manipulatives

Manipulatives are important in building concepts and moving students from the concrete to the abstract. Demonstration and hands-on use of counters, number lines, base ten blocks, attribute shapes, fraction pieces, play money, etc. are an important part of mathematics instruction.

_D_ 17. Rote memorization of formulas and procedures

Little time should be spent with initial memorization of formulas and procedures. These should build from carefully planned activities that promote understanding and use. Learning necessary formulas and procedures should follow the student's understanding and using the concept.

_D_ 18. Practicing problems categorized by types (e.g., coin problems, age problems, distance problems)

Teacher demonstration of solving a particular type of problem followed by students practicing problems requiring the same steps does little to involve students in real problem solving. Rather than this approach, the teacher can involve students by extending a single problem by asking "what if" questions. Indepth work by extending a single problem leads to better understanding of problem solving.

_I_ 19. Problem-solving strategies such as guess and test, draw a picture, or make a chart

Making a sketch or diagram, creating a chart, using manipulatives, acting out a situation, are examples of strategies that should be everyday problem-solving tools in the mathematics classroom. Using strategies, rather than rules, as a problem-solving approach adds to student understanding and gives them tools to use in new problem-solving situations.

_I_ 20. Place value concepts

Place value is central to understanding number concepts and building number sense. An understanding of computation, decimals, effective use of calculators, estimation, and mental arithmetic require students to understand place value. Use of manipulatives, such as base ten blocks, is an effective way of building place value concepts.

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Workshop Goals

- To foster an understanding of problem solving as a process
- To stress the importance of problem solving for all students
- To model problem solving as a process that can be taught
- To clarify the teacher's role in teaching problem solving

POLYA'S CONCEPTUAL MODEL

1. Understand the problem

Devise a plan **2.**

3. Carry out the plan

Look Back **4.**

Non-Routine Problems

Process Problems

- Stress the process of obtaining a solution, not just a numerical answer

- Require the use of one or more strategies

- Frequently can be solved in several ways

- Often have more than one answer

- Usually take longer to solve

- Provide opportunities for cooperative learning

Transparency 13


TEACHER'S ROLE IN PROBLEM SOLVING

1. Make sure the children understand the problem

2. Create an atmosphere where working on the problem is more important than getting the right answer

3. Encourage the children to talk with each other and to work together

4. Lead a post-solution discussion in which the students share their methods

Transparency 16

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	FG - FGA	FT - FTA	PTS
Miller	12 - 28	4 - 4	3 5

1. In the above box-score, what do the abbreviations and numbers mean?

2. What can you tell about Miller's performance?

3. Did Miller score any 3-point shots? If so, how many?

4. What strategies did your group use to figure out the solution?

5. WHAT IF another player scored 10 points? What are all the different combination of shots by which a player could score 10 points?

6. What strategies were used to solve question 5?

Use colored chips or cut-out basketballs for manipulatives.

FT
1

2
pointer

3
pointer
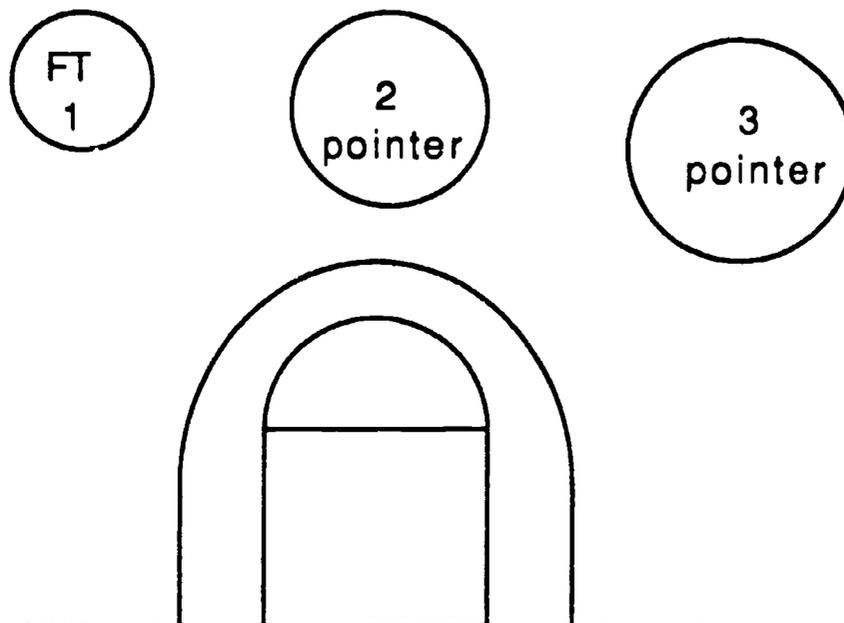
	FG - FGA	FT - FTA	PTS
Miller	12 - 28	4 - 4	3 5

Use colored chips or cut-out basketballs
for manipulatives.

FT
1

2
pointer

3
pointer
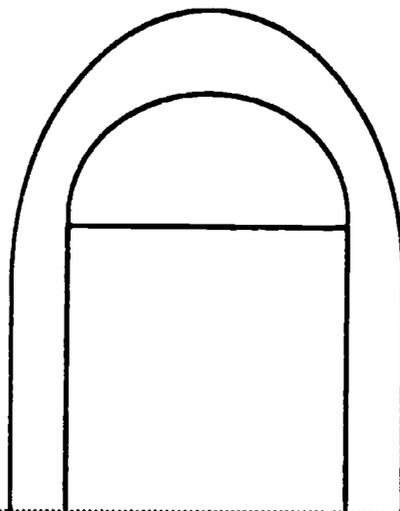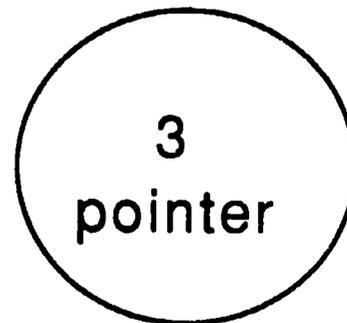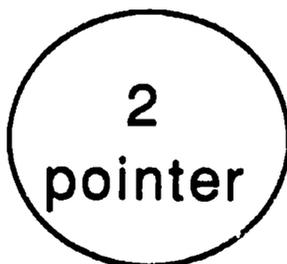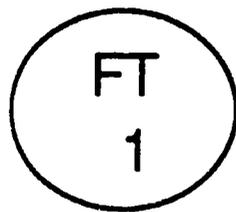
Transparency

supplemental
problem-solving
materials

CHAPTER 1 DESIRED OUTCOME for PROBLEM SOLVING

A desired outcome is a goal statement or measurable objective which focuses on what children will learn and accomplish as a result of their participation in the Chapter 1 program.

Desired Outcome: 80% of Chapter 1 mathematics students will show continuous growth in the four problem-solving goal areas of our program* as measured by a Problem-solving Performance Rating Scale** completed for each student by Chapter 1 staff during September, January, and May.

* Chapter 1 mathematics problem-solving goals:

   o   demonstrate a willingness to engage in problem solving

   o   demonstrate self-confidence in working with non-routine problems

   o   be able to identify the important information in a problem statement

   o   be able to use the following strategies: choose the operation, draw a picture, look for a pattern, guess and check, and use objects

**   Ruth developed the observation rating scale in figure 23 to reflect the four goals she had already established. Her observations of the children's group work, together with her general impressions from looking at individual papers, serve as her sources of data for completing the scale.

```
┌─────────────────────────────────────────────────────────────┐
│ Student: _____      Date: _____         │
│                                      Frequently Sometimes Never│
│                                                               │
│  1. Shows a willingness to try problems                       │
│  2. Demonstrates self-confidence                              │
│  3. Selects all important information                         │
│  4. Uses strategies appropriately:                            │
│       a) choose the operation                                 │
│       b) draw a picture                                       │
│       c) look for a pattern                                   │
│       d) guess and check                                      │
│       e) use objects                                          │
└─────────────────────────────────────────────────────────────┘
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Fig 23   Ruth's Problem-solving Performance Rating Scale

** Sample rating scales and their uses (as well as other methods of evaluating more advanced mathematical skills) can be found in How to EVALUATE PROGRESS IN PROBLEM SOLVING, National Council of Teachers of Mathematics, 1906 Association Drive, Reston, Virginia 22091   Copyright 1987   Phone: 703/620-9480   Cost: $6.00

supplemental problem-solving materials

DEVELOPING A
PROBLEM-SOLVING LESSON

Pamala Byrd Cemen

Problem solving is one of the most important mathematical abilities that teachers can foster in students, as evidenced by its prominent role in NCTM's *Curriculum and Evaluation Standards for School Mathematics* (1989) and *An Agenda for Action* (1980). Because of the increased availability of calculators and computers, knowledge of which computations are necessary is more important than proficiency in carrying out those computations. As a result, elementary school teachers are being encouraged and entreated to teach problem solving. However, teaching such a topic at higher cognitive levels is far from easy; the key is to be able to ask good questions. Because excellent problem-solving questions are seldom created "on the spot," teachers will benefit from writing lesson plans that include questions they can ask at crucial moments, keeping in mind they may not need the questions at all.

This article emphasizes questioning skills and outlines the development of a fourth- or fifth-grade lesson structured around Pólya's four stages of problem solving. The lesson uses

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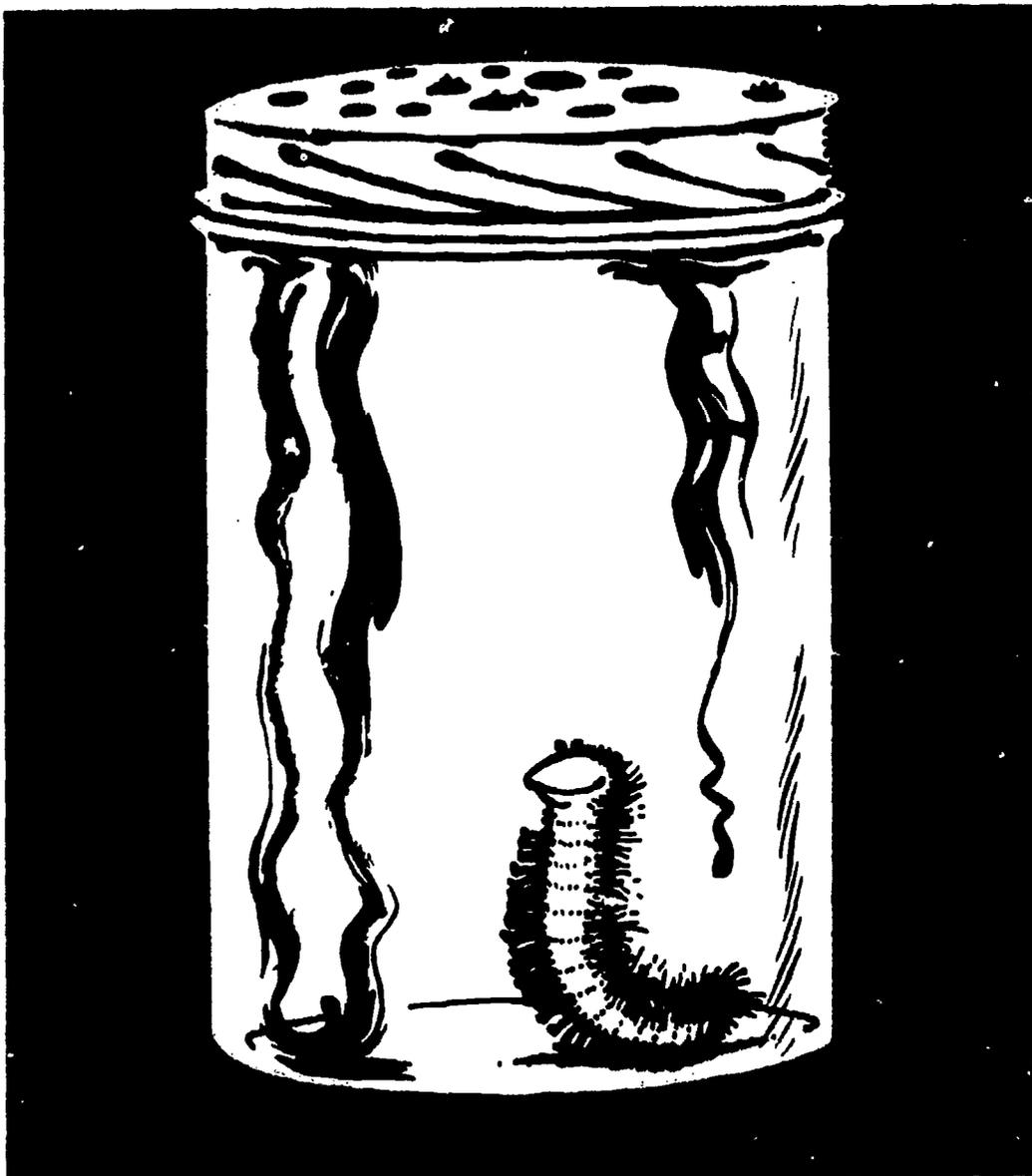
problems that lend themselves to more than one strategy or method of solution (see reference note) and questions that help students through

Pólya's stages of understanding the problem, devising a plan, and looking back and extending the problem.

The goal of the lesson is to help el-

ementary school students develop skills in the process of solving problems and to help them learn solution strategies. The lesson is developed in three phases: (1) solving problems and devising strategies, (2) writing questions, and (3) incorporating this work into a lesson plan. The lesson plan itself has two parts: (a) a generic plan that can be used with any problem and (b) specific problems written in detail. The three-phase plan can guide classroom teachers in developing their own lessons, or it can form the basis of a project for teacher educators to assign in their courses.

The three phases are described first. One generic lesson plan is presented in the discussion of the third phase. Two specific problems are presented as examples of the second part of the lesson plan and as illustrations of many of the ideas in the article. A description is given of how teacher educators can use the material presented here in courses for preservice and in-service elementary school teachers. Finally, solutions to the five problems in figure 1 are presented along with pertinent questions for each.

Phase 1

Choose three problems from the list in **figure 1**. Solve them, keeping track of the strategies used. Be sure to find all possible answers. Also, try to monitor your thinking process. Now, try to think of other ways you could have solved each problem. How might a fourth- or fifth-grade student try to solve it? Find at least three different strategies for each problem so as to be prepared for the various approaches the students take and to be open to their way of thinking about the problems. Helping strategies, such as solving a simpler problem or using an equation, do not yield the final solution by themselves. Although helping strategies can be included, it is best to find at least two other strategies for each problem.

Phase 2

Write a series of questions for each problem that can be used to teach

---

F I G U R E   1

Process problems

1. Rodriguez gets $1.60 a week for allowance. This week his mother paid him nineteen coins in nickels, dimes, and quarters. Show how many of each coin he got.

2. Some children are seated at a large, round table. They pass around a box of candy containing twenty-five pieces. Sue takes the first piece. Each child takes one piece of candy as the box is passed around. Sue also gets the last piece of candy, and she could have additional pieces. How many children could be seated around the table, including Sue?

3. A caterpillar is put on the bottom of a jar that is eight inches high. The jar has a lid with holes. Every day the caterpillar crawls up four inches. Every night it slips back two inches. How many days will it take for the caterpillar to touch the lid of the jar?

4. Ivan and Maria are playing cards using a special deck containing only 1, 2, 3, 4, 5, 6, 7, 8, and 9, each appearing once. Maria dealt Ivan a hand of three cards. He said that the three cards had a sum of fifteen. What are all the possible hands Ivan could have?

5. Wongyu has some change, but he cannot make change for a nickel, a dime, a quarter, a half dollar, or a dollar. If his largest coin is smaller than a dollar, what is the greatest amount of money he could have?

---

fourth- or fifth-grade students. Include at least three questions in each of the categories that follow.

Questions for understanding of the problem are very straightforward. They bring out the important information in the problem. They are a more specific version of the general question, What do we know? Although such general questions can be included in the lesson, it is helpful to have specific questions prepared. See the sample problems for some examples of questions for understanding.

Questions for getting started are the most difficult for a teacher to write, but they are a key to a successful problem-solving lesson. They reflect understanding of the problem. The goal of this type of question is to help the student get started solving the problem in his or her *own way*. Teachers are tempted to ask question at this stage that lead the student through the instructor's way of thinking, thus teaching the problem (which is not important), not the process of solving the problem. Several suggestions include (a) asking questions that go past initial understanding of the

problem, (b) posing simpler problems, and (c) asking questions that get the student to perform the types of calculations required in the problem. Be sure your questions do not lead to a particular strategy but are general enough that the student can discover a strategy with which he or she is comfortable. See the examples in the sample problems.

Questions for extension guide the student in summarizing how the problem was solved and then applying the strategies just used to solving a more difficult extension of the problem. These questions also can guide the student to finding more efficient strategies. Again, see the sample problems for examples.

Phase 3

Write the lesson plan. A useful format involves a general or generic plan, which is adaptable to any set of problems, with specific problems developed and written separately and included at an appropriate place in the lesson. Several approaches are possible. For example, the teacher can

work with one small group while the rest of the class is involved in an unrelated task. This approach allows the teacher to stay with the group and ask all the questions orally. Another approach involves dividing the class into small groups. A generic lesson plan for this approach follows.

1. Break the class into groups of three to five students. Give each student a copy of the first problem as well as plenty of scrap paper. (One attractive way to present a problem is to write it on construction paper with a marker.) Either read the problem or have one student in each group read it out loud.

2. Give each group a copy of the questions for understanding and encourage discussion.

3. Encourage the students to try to solve the problem. Move from group to group, asking questions for getting started, as necessary, while they work.

4. When a group finishes solving the problem, check students' work and then give them a copy of the questions for looking back and extension. Have each student write down the solution and his or her strategy for both the original problem and the extension.

5. As each group finishes the extension, give the students the next problem. They should be able to solve two or three problems in a half hour.

6. Spend the last ten to fifteen minutes of class time discussing the problems with the class as a whole. Focus on the looking-back-and-extension stage.

The generic lesson plan is followed by a write-up of each problem to be used, summarizing the work carried out in phases 1 and 2. The following format for writing individual problems may be useful. For each problem include—

1. a copy of the problem,
2. a demonstration and explanation of each strategy used with the strategies labeled,
3. questions for understanding,
4. questions for getting started, and
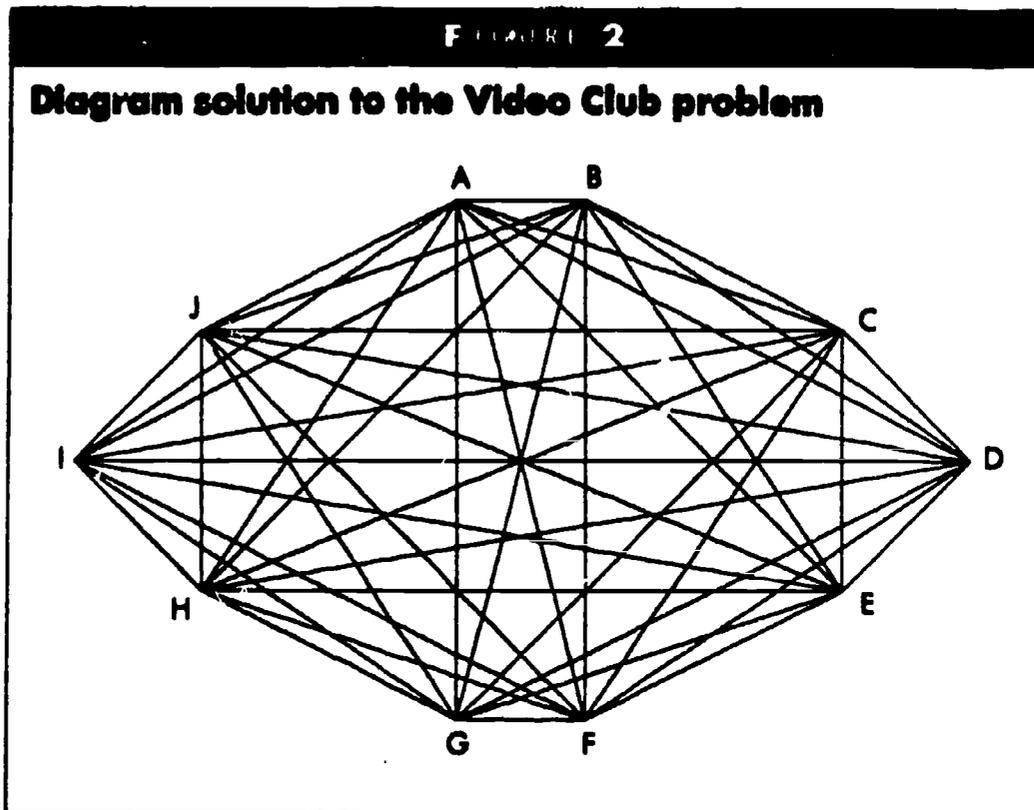
5. questions for looking back and extension, with solutions to the extension.

Sample Problems

As an example of how the problems can be formulated so as to be easily incorporated into the generic lesson plan, two sample problems follow. Particular attention should be paid to the strategies, the questions, and the format.

Problem 1

The Central Elementary School Video Club has ten members. Each member has one videotaped movie to share with the other members. When the club meets, each member trades movies with another member. At the next meeting, the movies are returned to their original owners to trade again. How many individual trades must be made for every member to have seen every movie?

Strategies

1. *Deduction.* Let's see, if I belong to the club, I trade movies with nine people. If Bob also belongs, he trades with nine. But he will trade with me when I trade with him, so that leaves eight for him to trade with. If Clare

also belongs, she will have only seven to trade with because she already traded with Bob and me. So I guess it's $9 + 8 + 7 + 6 + 5 + 4 + 3 + 2 + 1$, or forty-five trades.

2. *Deduction.* Let's see, if ten people are in the club, each member trades with nine other people. That makes ten times nine, or ninety trades. But wait, if I trade with Bob, he is trading with me. So I actually counted each trade twice. Thus, it must be ten times nine divided by two, or forty-five trades.

3. *Organized list.* Let A stand for the first person, B for the second person, and so on. AB represents a trade between A and B.

```
AB
AC BC
AD BD CD
AE BE CE DE
AF BF CF DF EF
AG BG CG DG EG FG
AH BH CH DH EH FH GH
AI BI CI DI EI FI GI HI
AJ BJ CJ DJ EJ FJ GJ HJ IJ
```

So forty-five trades are made. (Students can also list BA, CA, etc., and then cross out the pairs of letters that represent duplicate trades.)

4. *Diagram.* See figure 2.

Figure 2
Diagram solution to the Video Club problem

5. *Looking for a pattern and using a table.* Well, if only one person was a club member, no trades would be made; if two people, one trade would occur; if three people, three trades, and so on. (To find the solutions for greater numbers of people, the student will need to use one of the other strategies, such as a diagram or an organized list.) I recorded my solutions in a table and discovered that I can multiply the number of people by one less than that number and divide by two.

People	1	2	3	4	5	6
Trades	0	1	3	6	10	15

Helping strategies

6. *Acting the problem out.* Ten people could stand in a circle and act out the problem, counting the trades as they go. (This activity could lead to the discovery of one of the other strategies.)

7. *Solving a simpler problem.* Suppose that the club had only four members. (While working with the smaller numbers, the student might discover one of the other strategies, which can then be applied to the original problem.)

Questions for understanding

1. How many people are in the club?
2. How many videotapes does each member have to trade?
3. How many times does each pair of people trade videotapes?

Questions for getting started

1. If you were in the club, with how many people would you trade videotapes?
2. How many trades occur with only four people in the club?
3. If I trade with you, are you trading with me?

Questions for looking back

1. How did we solve this problem? (or, What kind of strategy did we use?)
2. Could we have solved it any other way? How? Any others?

Questions for extension

3. How many trades would occur with twenty people in the club? (Solution: 190 trades)
4. Suppose that four of the ten members each had two videotapes to trade instead of one, but would trade their second tape only with someone who had a videotape they had not seen. How many trades would be required for everyone to see as many movies as possible, but no movie twice? (Solution: 51 trades—45 original with 6 among the 4 members with 2 films)

Problem 2

Mona and Tom's parents bought a bicycle store with quite a few disassembled bicycles and tricycles. In one part of the store, Mona counted forty-three wheels. In another part, Tom counted seventeen frames. Their mother said she would put all the wheels on all the frames. If all the cycles work after the wheels are put back on, how many bicycles will result? How many tricycles?

Strategies

1. *Organized list*

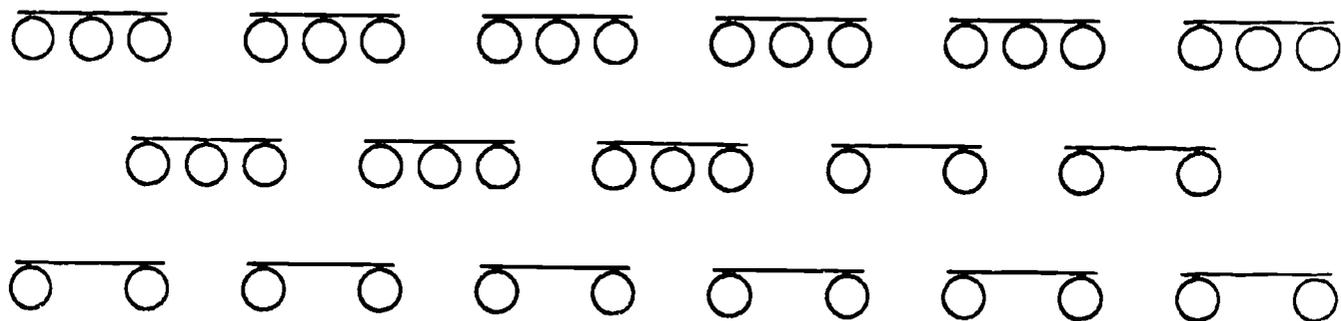| Bicycles	Tricycles	Wheels
3	14	48
4	13	47
5	12	46
7	10	44
8	9	43

I started by guessing three bicycles, leaving fourteen tricycles out of a total of seventeen frames, but that combination required too many wheels. So I kept trying more bicycles, keeping the number of frames constant until I got forty-three wheels. So there were eight bicycles and nine tricycles. (Note: The number of wheels could be kept the same at 43 and the number of frames changed.)

2. *Diagram.* See **figure 3.** I drew seventeen lines for the frames and put two wheels on each. Then I put a third wheel on each one until I had used a total of forty-three wheels. This strategy gave me nine tricycles and eight bicycles.

3. *Deduction.* I have seventeen frames. If they were all bicycle frames, I would have thirty-four wheels. Since $43 - 34 = 9$, I have nine more wheels to deal with. If I put them onto my bicycles one at a time, I can make them into tricycles. Now I have nine tricycles. That leaves me eight bicycles. Let's see if this combination works. Nine tricycles times

FIGURE 3

Diagram solution to the bicycles-and-tricycles problem

three wheels is twenty-seven wheels. and eight bicycles times two wheels is sixteen wheels. Since $27 + 16 = 43$, the answer is eight bicycles and nine tricycles.

Helping strategies

4. *Solve a simpler problem.* What combination is possible with only six frames and sixteen wheels? (A student might solve this problem using one of the foregoing strategies. then apply that strategy to the original problem.)

5. *Acting out the problem.* The class could cut out 43 wheels. Seventeen children. standing in front of the class. could each take either two or three wheels until the right combination is reached.

6. *Guess and check.* I think there are three bicycles. I'll check by subtracting: $17 - 3 = 14$. So three bicycles would leave fourteen tricycles. Three bicycles have six wheels, and fourteen tricycles have forty-two wheels: the sum is $6 + 42 = 48$. Forty-eight wheels are too many. (Note: This strategy can lead to the first one if children are encouraged to organize their guesses in a list.)

7. *Use an equation.* If B equals the number of bicycles and T equals the number of tricycles. then $B + T = 17$ and $2B + 3T = 43$. (This approach can help the student keep track of the information given while solving the problem with one of the other strategies.)

Questions for understanding

1. How many wheels did Mona count?
2. How many frames did Tom count?
3. How many wheels does a bicycle have? A tricycle?

Questions for getting started

1. Are fifteen tricycles possible?
2. Are only bicycles possible?
3. How many wheels are on four bicycles and three tricycles?
4. What combination is possible with only six frames and sixteen wheels?

Questions for looking back

1. How did we solve this problem?
2. Could we have solved it any other way?

Questions for extension

3. With fourteen bicycle frames. twelve tricycle frames, and forty-three wheels, what combinations of bicycles and tricycles are possible if all the wheels are used? (Solutions: eight bicycles and nine tricycles. five bicycles and eleven tricycles. eleven bicycles and seven tricycles. fourteen bicycles and five tricycles)

4. What combinations are possible with thirty-eight frames and ninety-three wheels using all the frames and wheels? (Solutions: twenty-one bicycles and seventeen tricycles)

Problem-solving Project

The lesson plan development described in this article can be used as the basis for a project in mathematics content or methods courses for preservice or in-service teachers. Before the project is assigned in a course. students could solve the two sample problems plus a few more at a slightly higher difficulty level. Also. Pólya's stages could be discussed and different strategies that can be used by pupils identified. As a project. students could write up three problems using the format described previously. The completed projects could be graded and returned with comments. then the students allowed to submit the corrected project for two-thirds credit. If a field experience is associated with the course. preservice students could use their completed projects as the core of a lesson plan. In-service teachers should be encouraged to use the results of the project with their own pupils.

Solutions and Questions

For each of the problems in figure 1,

the solution or solutions and some questions are furnished. In the previous discussion. several suggestions were made for writing questions for getting started. These suggestions lead to special types, or subcategories, of questions. Thus. each question for getting started is classified as either (a) a simpler problem. indicated with an S; (b) a question to deepen understanding. indicated with a U'. or (c) a question to encourage required calculations. indicated with a C.

Problem 1: Rodriguez's allowance

Solutions

> 15 nickels. 1 dime. and 3 quarters
> 12 nickels. 5 dimes. and 2 quarters
> 9 nickels. 9 dimes. and 1 quarter

Questions for understanding

1. How much is Rodriguez's weekly allowance?
2. How many coins did his mother give him?
3. What types of coins did his mother give him?

Questions to get started

1. How much is three nickels. four dimes. and one quarter? (C)
2. Could Rodriguez have seven quarters? (U)
3. What combination of coins is possible if Rodriguez got five coins and $0.55? (S)
4. What combinations are possible if he got $1.60 but only twelve coins? (S)

Question for extension

1. What combinations are possible if Rodriguez got twenty coins and $2.05? (Solutions: 5Q. 1D. 14N; 4Q. 5D. 11N; 3Q. 9D. 8N; 2Q. 13D. 5N; 1Q. 17D. 2N)

Problem 2: Sue and the candy

Solutions

> 2. 3. 4. 6. 8. 12. or 24 children. (Also. 1 child if "some" is not in-

terpreted as more than 1.)

Questions for understanding

1. How many pieces of candy are in the box? •
2. Which pieces does Sue definitely get?
3. How many pieces does each child take each time the box is passed?

Questions to get started

1. What is the solution if only seven pieces of candy are in the box? Thirteen pieces? (S)
2. Could Sue get four pieces? (U)
3. Could seven children be seated around the table? (U)

Questions for extension

1. What is the solution if thirty-seven pieces of candy are in the box? (Solution: 2, 3, 4, 6, 9, 12, 18, 36)
2. Do you see a pattern or an easy way to figure out the number of children for a given number of pieces of candy?

Problem 3: The caterpillar in the jar

Solution: 3 days

Questions for understanding

1. How high is the jar?
2. How far does the caterpillar crawl each day?
3. How far does the caterpillar slip each night?

Questions to get started

1. What if the jar was only four inches high? (U)
2. What if the jar was only six inches high? (S)
3. Where would the caterpillar be after the first day and night? (C)

Questions for extension

1. What is the solution if the jar is twelve inches high? (Solution: 5 days)
2. What is the solution if the jar is twelve inches high and the caterpillar crawls up five inches each day and slips back two inches each

night? (Solution: 3⅔ days)

Problem 4: Ivan and Maria playing cards

Solutions

1, 5, 9; 1, 6, 8; 2, 4, 9; 2, 5, 8;
2, 6, 7; 3, 4, 8; 3, 5, 7; 4, 5, 6

Questions for understanding

1. What cards are in the deck?
2. How many cards did Maria deal Ivan?
3. What was the sum of Ivan's cards?

Questions to get started

1. Could Ivan have 6, 6, 3? (U)
2. (After the first answer is given) Is 2, 5, 8 the same hand as 5, 2, 8? (U)
3. If Ivan has 2, 4, and 5, what is the sum of his cards? (C)
4. What hands are possible if the sum of the cards is twelve? (S)
5. What hands are possible if Ivan has two cards with a sum of fifteen? (S)

Questions for extension

1. What hands are possible if the deck has 1, 2, 3, 4, 5, 6, 7, 8, and 9, each appearing twice? (Solution: only four additional hands—9, 3, 3; 7, 4, 4; 6, 6, 3; 7, 7, 1)
2. What hands are possible if the deck has 1, 2, 3, 4, 5, 6, 7, 8, and 9, each appearing twice, and Ivan has four cards that add to fifteen? (Solution: 9, 4, 1, 1; 9, 3, 2, 1; 8, 3, 3, 1; 8, 4, 2, 1; 8, 5, 1, 1; 8, 3, 2, 2; 7, 6, 1, 1; 7, 5, 2, 1; 7, 4, 3, 1; 7, 4, 2, 2; 7, 3, 3, 2; 6, 4, 4, 1; 6, 5, 3, 1; 6, 6, 2, 1; 6, 5, 2, 2; 6, 4, 3, 2; 5, 5, 3, 2; 5, 4, 4, 2; 5, 4, 3, 3; 5, 5, 4, 1; 5, 4, 3, 3)

Problem 5: Wongyu's change

Solution: $1.19

Questions for understanding

1. What are the amounts for which Wongyu cannot make change?
2. His largest coin is smaller than what?
3. What does it mean to make change? For example, how do you make change for a nickel?

Questions to get started

1. What different ways can you make change for a quarter? (U)
2. Must Wongyu have one of each coin? (U)
3. How much money would you have if you had one quarter, one dime, one nickel, and three pennies? (C)
4. If Wongyu's largest coin was smaller than a quarter, how much money could he have? (S)

Question for extension

1. If Wongyu could make change for a half dollar, but not a nickel, a dime, a quarter, or a dollar, what is the greatest amount of money he could have? (Solution: $1.19)

Conclusion

The lesson outlined in this article offers one approach to problem solving. an approach that focuses on strategies and the problem-solving process. It uses questions to guide students through Pólya's stages of problem solving. With the material presented here, practicing teachers can develop their own lesson or teacher educators can have their students develop a lesson plan as a course project. The resultant lesson is a good starting point for young problem solvers. helping them acquire tools and confidence that can then be applied to other problem-solving situations, such as solving real-world problems.

References

National Council of Teachers of Mathematics An Agenda for Action. Recommendations for School Mathematics of the 1990s. Reston. Va.: The Council. 1980

National Council of Teachers of Mathematics Commission on Standards for School Mathematics. Curriculum and Evaluation Standards for School Mathematics Reston. Va The Council. 1989. ●
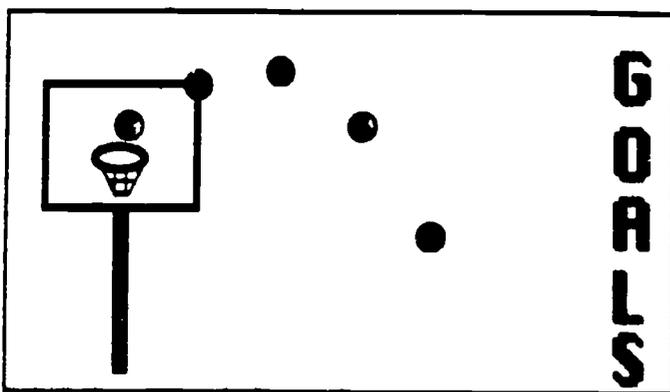
Participants will:

■ Understand estimation and its
importance as part of advanced
skills in Chapter 1
mathematics instruction.

■ Recognize classroom situations in
which estimation
should be used.

■ Learn specific estimation strategies
and activities to use in
Chapter 1 mathematics programs.

**Estimation involves
finding an
approximate answer
that is close enough
to the exact answer
to make a decision
or to suit
one's purposes.**

Estimation
Strategies

- **Front - End**

- **Multiplying by
10, 100, 1000**

- **Rounding**

- **Compatible Numbers**

Teaching Estimation
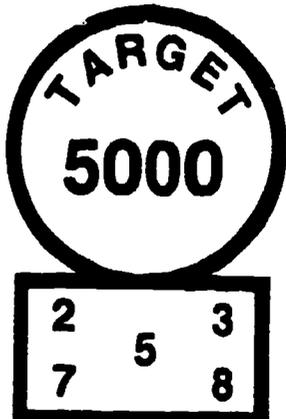## as a Process

- Include estimating and estimates as
part of <u>every</u> math lesson.

- Teach and model estimation <u>strategies</u>.

- Accept and model <u>different strategies</u>
for the <u>same problem</u>.

- Accept and discuss a <u>range</u> of
reasonable estimates.

- Teach <u>mental computation</u> along with
estimation.

IDEAS

Name _____

Estimating a Product in Two Tries

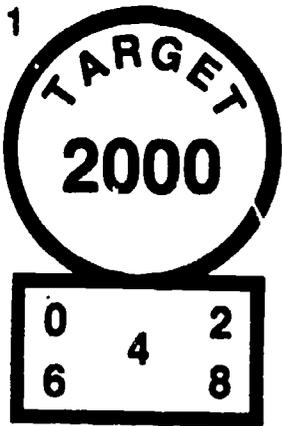Get as close to the target as you can in two tries.

1. Choose any three digits from the box. Arrange them as a three-digit number. Multiply by the given, 7, with a calculator and write the product.

2. If you need to improve your product by replacing any digit (but only one digit) with a new choice. You can rearrange these three digits to get closer to the target.

3. Your score is the difference between your closest product and the target. Low scores win.

Example

TARGET
5000

2		3
	5	
7		8

First try: 7 ☒ 753 ☐ 5271
Second try: 7 ☒ 723 ☐ 5061
Score: 61

Game 1
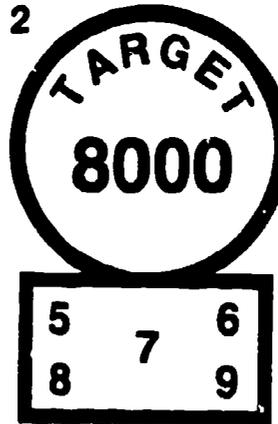
TARGET
2000

0		2
	4	
6		8

First try:
3☒☐☐☐ = _____
Second try:
3☒☐☐☐ = _____
Score: _____

Game 2

TARGET
8000

5		6
	7	
8		9

First try:
9 ☒☐☐☐ = _____
Second try:
9 ☒☐☐☐ = _____
Score: _____

Game 3

TARGET
4500

0		2
	4	
6		8

First try:
7 ☒☐☐☐ = _____
Second try:
7 ☒☐☐☐ = _____
Score: _____

Game 4

TARGET
3500

1		3
	5	
7		9
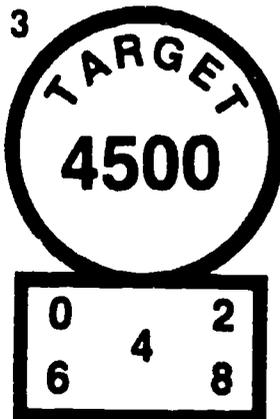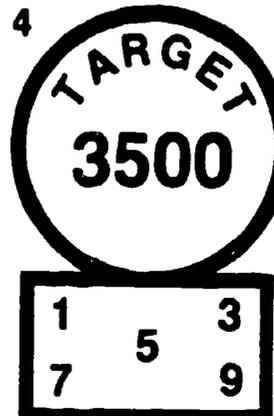
First try:
9 ☒☐☐☐ = _____
Second try:
9 ☒☐☐☐ = _____
Score: _____

Estimating a Product in Two Tries

TARGET

First try:

Second try:

Score:

"I HAVE.... WHO HAS...?" CARDS

A Mental Computation Activity

Using the Activity and Constructing Card Sets

1. A set of cards is constructed with a <u>Start</u> card, an <u>End</u> card, and any number of cards in between. The "Who has...?" question on one card is answered by the "I have...." answer on the next card. See the short example below.   Cards about the size of business cards work well.

2. Cards are randomly distributed to the students. Students may have one or more cards and do not all need the same number of cards.

3. The student with the <u>Start</u> card reads the card. The student with the answer reads his/her card, etc. until the <u>End</u> card is read.

4. Caution! In making a set of cards no two cards can have the same answer in the set. Have students create their own sets of cards to use with their classmates.

5. Include the <u>language of mathematics</u> as you construct card sets. Terminology such as sum, difference, half of, twice as much, the quotient of, the product of, etc. can be actively reinforced.

Example: A short set of "I have.... Who has...?" cards

<u>Start</u> I have 12. Who has twice as many?	I have 24. Who has the difference of this and 6?
I have 18. Who has half of this?	I have 9. <u>End</u>

"I HAVE.... WHO HAS...?" CARDS

A Mental Computation Activity

Example: A short set of "I have.... Who has...?" cards

<u>Start</u> I have 12. Who has twice as many?	I have 24. Who has the difference of this and 6?
I have 18. Who has half of this?	I have 9. <u>End</u>

HANDS ACROSS AMERICA--PASSING A HAND SQUEEZE
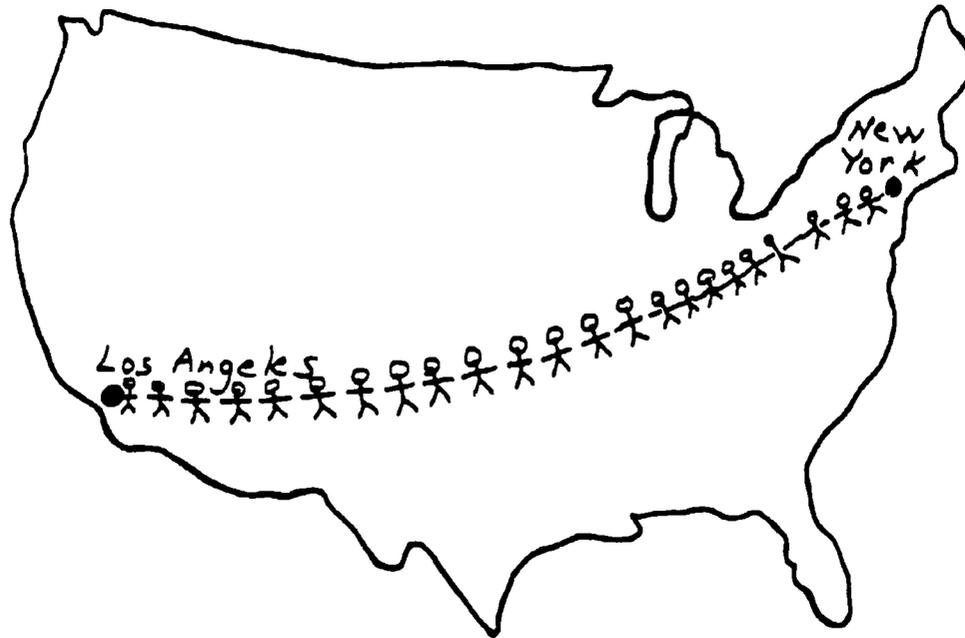
We are going to form a human chain from New York City to Los Angeles with people joining hands. How long will it take to pass a hand squeeze from one city to the other? As a cooperative group, complete the following:

1. What do you think (without doing any figuring) will be the most likely major unit for expressing the time it will take? Seconds--Minutes--Hours--Days--Years--Decades--Centuries?

2. What are the things we will have to know (or estimate) in order to solve the problem? Try to be specific.

    o

    o

    o

    o

3. Make estimates of the things you need to know (in #2) and determine the approximate time it will take to pass the hand squeeze.

4. If we start the hand squeeze from each city at the same time, where will be the geographic location of the person who will receive the squeeze from each direction at the same time?

HANDS ACROSS AMERICA

PASSING A HAND SQUEEZE
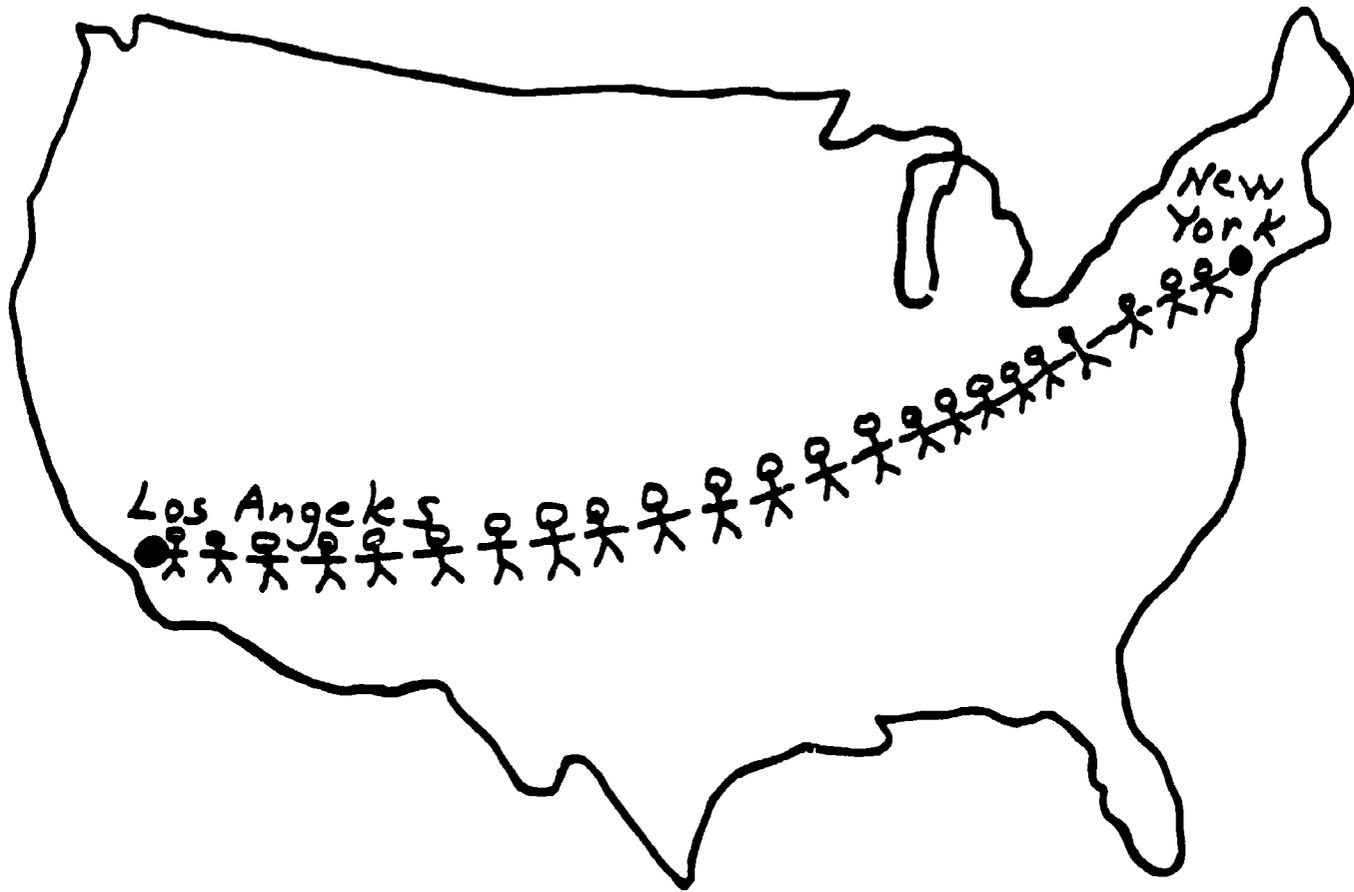
ADAPTING A LESSON

Adapt the following lesson to include estimation language and strategies. The following questions may be helpful in guiding your planning.

1. Will this be an introductory estimation lesson or an application of a strategy(s) already taught? *Flexibly using strategies already introduced.*

2. Will the entire lesson be focused on estimation or will estimation be only part of the lesson? *Combination of mental computation, estimation, and computation.*

3. Will a specific strategy(s) be emphasized or will students choose their own?
   - *front end*
   - *rounding*
   - *friendly numbers* } *Discuss and reinforce the flexible use of these 3.*

4. What mental computation skills need to be taught or reviewed to effectively use the strategy(s)? *Nothing special.*

5. Which problem(s) will be used? How will they be used?
   first Ex. 1+2 mental computation — exact answers
   second Ex. 4+6 Students estimate, then class discusses
   third Ex. 8 Is this a good estimate? Why or why not?
   fourth Ex. 9-16 assignment — Students choose 4 to estimate and 4 to compute.

EXERCISES   Add. Check answers.

first mental comp.

1.	4	2.	7	3.	64	4.	48
	5		3		98		27
	+8		6		+52		65
			+5				+17

second — Students estimate using whatever methods they choose. Discuss.

5.	471	6.	148	7.	7,584	8.	6,458
	526		364		1,657		984
	+212		+534		+4,798		+1,326
							7,000

third — Is this a good estimate?

9.	496	10.	8,457	11.	$24.85	12.	$48.64
	745		890		63.32		76.95
	377		6,729		39.72		35.79
	+634		+ 384		+ 54.28		+ 2.85

fourth assignment — students choose 4 to estimate and 4 to compute exact answers.

13. 73 + 439 + 48 + 236

14. 9,684 + 2,387 + 575

Solve.

15. Jim earned $39.52, $54.87, and $49.67. How much did he earn?

16. Ann read three books with 264, 98, and 174 pages. Find the total number of pages she read

3-WEEK "ESTIMATING" LOG

What did I do with my students each day to promote estimation? Write down your activity. It will serve as a motivator to continue and a resource for later.

WEEK 1

Monday

Tuesday

Wednesday

Thursday

Friday

WEEK 2

Monday

Tuesday

Wednesday

Thursday

Friday

WEEK 3

Monday

Tuesday

Wednesday

Thursday

Friday

T-33

Corner on Math

BY LOLA J. MAY

Estimation: Another View

The first in an eight-part series on the new standards that will guide math instruction during the 1990's

Last March, the National Council of Teachers of Mathematics issued a set of standards that will have a far-reaching effect on math instruction in the elementary grades. Since these standards will set the direction of the math curriculum during the next decade, they're of obvious importance to each and every elementary school educator who teaches mathematics.

Simply being aware of the new math standards isn't going to help you in the classroom, of course. There, you'll need strategies and activities that will enable you and your students to meet those standards ... and that's where "Corner on Math" can be a big help.

All of the "Corner on Math" columns this publishing year will pertain to the standards issued by the Council. Beginning with this issue, I'll cover those standards that are most important to the classroom teacher and, as usual, I'll include activities for both the primary and intermediate grades.

Let's begin with one area of mathematics covered by the new standards—*estimation.*

In estimation, the use of such terms as *about, near, closer to, between* and *little less than* illustrates that math, contrary to popular opinion, involves more than exactitude. The goal here is to teach children that it's sometimes easier and more reasonable to estimate an answer than it is to give the exact answer. In fact, there are times when estimation is the *only* choice one has in a given situation.

Estimation is not something that can be taught in a single unit of instruction; rather, it should be integrated throughout the study of math. Why? Simply because students need to develop a mind-set about estimation, along with a sense of numbers, so they can use good judgment and logical reasoning for decision making and problem solving in their daily lives. You can't develop a mind-set with a single lesson, of course—no matter what the subject or how hard you try.

Primary Activities

Number sense. Here's an activity that will help young children develop number sense. In each of the following statements, have the children circle the *most sensible* number.

In most classrooms, there are about this many children:

    5   25   100

A child can lift about this many books:

    100   15   4

A child can hold about this many crayons in one hand:

    50   5   20

In the entire school, there are about this many students:

    45   425   4,250

These four examples are only the beginning, of course. You can easily think up many more just like them to put before your children. Don't expect immediate results, though. Number sense cannot be developed overnight. In fact, many children will still be working hard to develop it when they're in the intermediate grades.

Lola May is Math Consultant for the Winnetka (IL) Public Schools and a Teaching Editor of *Teaching K-8.*

Establishing bench marks. The following activities, all of which deal with objects in real life, help children establish bench marks (or points of reference) in estimating.

Show the children a book that has approximately 50 pages. Then show them a book that has approximately 100 pages. After telling the children the number of pages in the first book, have them estimate the number of pages in the second book.

Show the children a stack of five cards. Then show them another stack of 20 cards. Tell them the number of cards in the first stack and ask them to estimate the number in the second stack.

Place four index cards, edge to edge, on one corner of a desk. Ask the children to estimate how many cards will be needed to cover the entire desk.

Show the children a pile of counters. Remove five counters, count them aloud, and make a new pile. Have the children estimate how many counters remain in the first pile.

Line up three chalkboard erasers on a chalkboard ledge, starting at one end of the ledge. See if the children can estimate the length of the ledge in terms of erasers.

Intermediate Activities

Estimation strategies. Show your students a long list of numbers to be added, or double-digit numbers to be multiplied, like the examples given below, and they'll probably groan. But the groans will turn to grins when they find out how much fun it is to estimate the answers. Being able to look at a problem and come up with a quick, approximate answer is a guaranteed ego-booster.

Here are some strategies that will help intermediate students develop a mind-set about estimation:

Compatible number strategy. This strategy consists of finding pairs of compatible numbers that will add up to approximately 100 (or some other approximate number that's easy to deal with). In the following example, there are three such pairs: 27 and 81, 38 and 65, 49 and 51. When you have three pairs of numbers, with each pair adding up to about 100, the answer has just got to be about 300.

$$\begin{array}{r} 27 \\ 49 \\ 81 \\ 65 \\ 51 \\ + \ 38 \\ \hline \end{array}$$

Front-end strategy. In the hundreds column of the following problem, add 2 + 3 + 4. The answer, of course, is 900. Now add the compatible numbers 1 + 8 in the tens column and you end up with about 100. After adjustment, the estimate is about 1,000.

$$\begin{array}{r} 212 \\ 486 \\ + \ 309 \\ \hline \end{array}$$

Front-end strategy can also be used to estimate problems involving dollars and cents. In the following problem, front-end total the dollars:

1 + 4 + 1 + 2 = $8.00. Adjust by compatible sets: .26 + .79 = almost $1.00; .99 = almost $1.00; .37 + .58 = about $1.00. Estimate: $8.00 + $3.00 = $11.00.

$$\begin{array}{r} \$1.26 \\ 4.79 \\ .99 \\ 1.37 \\ + \ 2.58 \\ \hline \end{array}$$

Rounding strategy. This particular strategy consists of rounding numbers to the nearest 10. For example:

27 x 58
30 x 60 = 1,800 (round *up* estimate)

62 x 23
60 x 20 = 1,200 (round *down* estimate)

62 x 79
60 x 80 = 4,800 (round *up and down* estimate)

If you have a problem in which both factors are near the midway point between 10's, simply round one number up and the other down. For example:

36 x 75
40 x 70 = 2,800

Developing number sense. Here are some exercises that can be used to help develop a sense of numbers in students on the intermediate level.

In each of the following sentences, fill in an amount that makes sense:
I can do ____ multiplication facts in one minute.

I am in school about ____ hours in a week.
There are about ____ students in my school.
I can hold my breath about ____ seconds.

Is 3/4 + 1/2 more, less or equal to 1?
Is 1/3 of 72 more, less or equal to 20?

A school bus holds 52 students. There are 551 students going on a field trip. How many buses are needed? Describe how you made your decision.

Place four metersticks end to end, starting at one end of the hall. Estimate the length of the hall in meters. Of the following four multiplication problems, which product looks unreasonable?

$$\begin{array}{r} 47 \\ \times \ 9 \\ \hline 423 \end{array} \qquad \begin{array}{r} 38 \\ \times \ 12 \\ \hline 3,516 \end{array}$$

$$\begin{array}{r} 98 \\ \times \ 16 \\ \hline 1,568 \end{array} \qquad \begin{array}{r} 27 \\ \times \ 32 \\ \hline 864 \end{array}$$

An ice-maker makes about 27 ice cubes in an hour. About how many ice cubes will it make in one day?

The ability to estimate is a skill that will be used by your students throughout their lives. Indeed, it's difficult to imagine living a normal, productive life without being able to estimate—and that's one very good reason why estimation has been included in the new math standards issued by the National Council of Teachers of Mathematics. Next month, I'll deal with another standard. ↓

PEOPLE SEARCH

FIND SOMEONE WHO:

Can name the six levels of Bloom's Taxonomy.	**Can explain metacognition.**
Shares your views about Dan Quayle.	**Ranks these items the same as you do:** ☐ mind ☐ body ☐ soul
Can name the ten longest rivers in the United States. **Can you find someone who really cares?**	**Memorized all of the state capitals as a student.** **Can they still name them? (However, there isn't time for proof!)**

Advanced Skills in Chapter 1....

Thinking about Reading about Thinking about Reading about Thinking
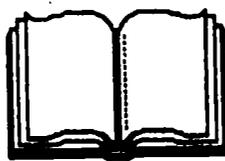
The Discus Thrower

Richard Selzer (b.1928) is a surgeon and professor of surgery at the Yale University Medical School, as well as an award-winning author. In the essay reprinted here, which first appeared in Harper's magazine in 1977, Selzer reports on the visits he made to one of his patients.

I spy on my patients. Ought not a doctor to observe his patients by any means and from any stance, that he might the more fully assemble evidence? So I stand in the doorways of hospital rooms and gaze. Oh, it is not all that furtive an act. Those in bed need only look up to discover me. But they never do.

From the doorway of Room 542, the man in the bed seems deeply tanned. Blue eyes and close-cropped white hair give him the appearance of vigor and good health. But I know that his skin is not brown from the sun. It is rusted, rather, in the last stage of containing the vile repose within. And the blue eyes are frosted, looking inward like the windows of a snowbound cottage. This man is blind. This man is also legless--the right leg missing from the midthigh down, the left from just below the knee. It gives him the look of a bonsai, roots and branches pruned into the dwarfed fascimile of a great tree.

Propped on pillows, he cups his right thigh in both hands. Now and then he shakes his head as though acknowledging the intensity of his suffering. In all of this, he makes no sound. Is he mute, as well as blind?

The room in which he dwells is empty of all possessions -- no get-well cards, small, private caches of food, day-old flowers, slippers, all the usual kickshaws of the sickroom. There is only the bed, a chair, a nightstand, and a tray on wheels that can be swung across his lap for meals.

"What time is it?" he asks.
"Three o'clock."
"Morning or afternoon?"
"Afternoon."

He is silent. There is nothing else he
wants to know.

"How are you?" I say.
"Who is it?" he asks.
"It's the doctor. How do you feel?"

He does not answer right away.

"Feel?" he says.
"I hope you feel better." I say.

I press the button at the side of the bed.

"Down you go." I say.
"Yes, down." he says.

He falls back upon the bed awkwardly. His
stumps, unweighted by legs and feet, rise in the
air, presenting themselves. I unwrap the ban-
dages from the stumps, and begin to cut away the
black scabs and the dead glazed fat with scissor
and forceps. A shard of white bone comes loose.
I pick it away. I wash the wounds with disin-
fectant and redress the stumps. All this while,
he does not speak. What is he thinking behind
those lids that do not blink? Is he remembering
a time when he was whole? Does he dream of
feet? Of when his body was not a rotting log?

He lies solid and inert. In spite of every
thing, he remains impressive, as though he were
sailor standing athwart a slanting deck.

"Anything more I can do for you?" I asked.

For a long moment he is silent.

"Yes," he says at last and without the least
irony. "You can bring me a pair of shoes."
In the corridor, the head nurse is waiting
for me.

"We have to do something about him," she
says. "Every morning he orders scrambled eggs
for breakfast, and, instead of eating them, he
picks up the plate and throws it against the
wall."

"Throws his plate?"

"Nasty. That's what he is. No wonder his
family doesn't come to visit. They probably
can't stand him any more than we can."

She is waiting for me to do something.

"Well?"

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"We'll see." I say.

The next morning I am waiting in the corri-
dor when the kitchen delivers his breakfast. I
watch the aide place the tray on the stand and
swing it across his lap. She presses the button
to raise the head of the bed. Then she leaves.

In time the man reaches to find the rim of
the tray, then on to find the dome of the cov-
ered dish. He lifts off the cover and places
it on the stand. He fingers across the plate
until he probes the eggs. He lifts the plate
in both hands, sets it on the palm of his right
hand, balances it. He hefts it up and down
slightly, getting the feel of it. Abruptly,
he draws back his right arm as far as he can.

There is the crack of the plate breaking
against the wall at the foot of his bed and
the small wet sound of the scrambled eggs
dropping to the floor.

And then he laughs. It is a sound you
have never heard. It is something new under
the sun. It could cure cancer.

Out in the corridor, the eyes of the head
nurse narrow.

"Laughed, did he?"
She writes something down on her clipboard.
A second aide arrives, brings a second breakfast
tray, puts it on the nightstand, out of his reach
She looks over at me shaking her head and making
her mouth go. I see that we are to be accom-
plices.

"I've got to feed you," she says to the man.
"Oh, no you don't," the man says.
"Oh, yes I do," the aide says "after the way
you just did. Nurse says so."

"Get me my shoes," the man says.
"Here's oatmeal," the aide says. "Open."

And she touches the spoon ɔ his lower lip.

"I ordered scrambled eggs," says the man.
"That's right," the aide says.

I step forward.

"Is there anything I can do?" I say.
"Who are you?" the man asks.

In the evening I go once more to the ward
to make my rounds. The head nurse reports to me

3   40

that Room 542 is deceased. She has discovered
this quite by accident, she says. No, there had
been no sound. Nothing. It's a blessing, she
says.

I go into his room, a spy looking for
secrets. He is still in his bed. His face is
relaxed, grave, dignified. After a while, I
turn to leave. My gaze sweeps the wall at the
foot of the bed, and I see the place where it
has been repeatedly washed, where the wall
looks very clean and white.

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PASSAGE 2
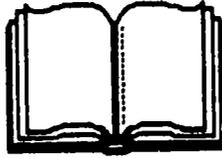
With one end of the vehicle in such a position, the wooden implement was totally useless. A different tool might remedy the situation somewhat, but, unfortunately, one was not close at hand. The lack of balance made forward progress impossible. Changing positions would not help due to the nature of the vehicle, and jumping up and down could to other problems. In order to make better use of the implement, the man would have to alter his position quite a bit, and he would either topple over, or the whole thing would be reversed. Gazing downward at his bulky companion who seemed disinterested in his plight, the man decided the only remedy was to bring some other assistant the next time. The right kind of person would certainly eliminate the problem.

PASSAGE 3
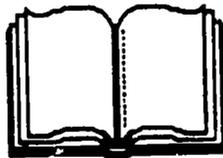
If the balloons popped, the sound wouldn't be able to carry since everything would be too far away from the correct floor. A closed window would also prevent the sound from carrying, since most buildings tend to be well insulated. Since the whole operation depends on a steady flow of electricity, a break in the middle of the wire would also cause problems. Of course, the fellow could shout, but the human voice is not loud enough to carry that far. An additional problem is that a string could break on the instrument. Then there could be no accompaniment to the message. It is clear that the best situation would involve less distance. Then there would be fewer potential problems. With face to face contact, the fewest number of things could go wrong.

PASSAGE 4
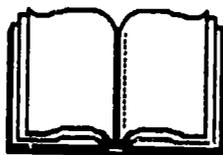
Louis slowly got up from the mat, planning his escape. He hesitated a moment and thought. Things were not going well. What bothered him most was being held, especially since the charge against him had been weak. He considered his present situation. The lock that held him was strong but he thought he could break it. He knew, however, that his timing would have to be perfect. Louis was aware that it was because of his early roughness that he had been penalized so severely-much too severely from his point of view. The situation was becoming frustrating; the pressure had been grinding on him for too long. He was being ridden unmercifully. Louis was getting angry now. He felt he was ready to make his move. He knew that his success or failure would depend on what he did in the next few seconds.

PASSAGE 5
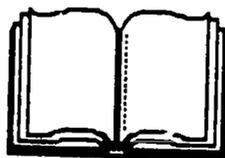
Every Saturday night, four good friends get together. When Jerry, Mike, and Pat arrived, Karen was sitting in her living room writing some notes. She quickly gathered the cards and stood up to greet her friends at the door. They followed her into the living room but as usual they couldn't agree on exactly what to play. Jerry eventually took a stand and set things up. Finally, they began to play. Karen's recorder filled the room with soft and pleasant music. Early in the evening, Mike noticed Pat's hand and the many diamonds. As the night progressed, the tempo of play increased. Finally, a lull in the activities occurred. Taking advantage of this, Jerry pondered the arrangement in front of him. Mike interrupted Jerry's reveries and said, "Let's hear the score." They listened carefully and commented on their performance. When the comments were all heard, exhausted but happy, Karen's friends went home.

43
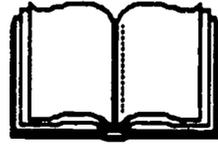
Passage 6

Τηε γρεατεστ γοοδ ωε χαν δο φορ

οτηερσ ισ νοτ φυστ το σηαρε

ουρ ριχηεσ ωιτη τηεμ

≈ βυτ ≈

το ρεῶεαλ τηειρ ριχηεσ το

τηεμσελῶεσ.

PASSAGE 7
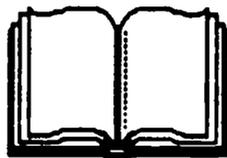
Missing Lips

My lips threaten to run away
To disappear without a trace
To fall down my mouth forever.

Wait, I cry. Don't leave me.
I stab at them with my lipstick,
Try to make them understand.

Leave us alone, they answer.
We want to go away
To a warmer climate for the winter.

Go then, I scream.
See how you do without me.
See if you find someone to feed you.

They fly south on my credit cards,
Charge hotels and meals in Fort Lauderdale,
Swim suits and lounge robes in Palm Springs.

In March they return,
Juicy and brassy,
Talking too much,
Even to strangers in elevators
Who look at the floor indicators and
Try not to notice.

They kiss far too often that summer,
Multitudes of mouths on tennis courts and in
cloakrooms.
But none seem to move them
Out of their terrible insolence.

I try to ignore them.
They are getting out of hand.
I feed them nothing but lip gloss for months.

They take off on a Greyhound bus,
Work as waitresses, mouth off to truckdrivers
Who complain about weeping meringues on lemon pies.

45
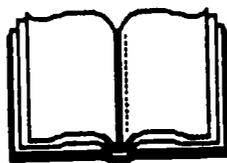
And the Rock Cried Out

Ray Bradbury

The raw carcasses, hung in the sunlight, rushed at them, vibrated with heat and red color in the green jungle air, and were gone. The stench of rotting flesh gushed through the car windows, and Leonora Webb quickly pressed the button that whispered her door window up.

"Good Lord," she said, "those open-air butcher shops."

The smell was still in the car, a smell of war and horror.

"Did you see the flies?" she asked.

"When you buy any kind of meat in those markets," John Webb said, "you slap the beef with your hand. The flies lift from the meat so you can get a look at it."

He turned the car around a lush bend in the green rain-jungle road.

"Do you think they'll let us into Juatala when we get there?"   "I don't know."

"Watch out!"

He saw the bright things in the road too late, tried to swerve, but hit them. There was a terrible sighing from the right front tire, the car heaved about and sank to a stop. He opened his side of the car and stepped out. The jungle was hot and silent and the highway empty, very empty and quiet at noon.

He walked to the front of the car and bent, all the while checking his revolver in its underarm holster. Leonora's window gleamed down. "Is the tire hurt much?"

"Ruined, utterly ruined!" He picked up the bright thing that had stabbed and slashed the tire.

"Pieces of a broken machete," he said, "placed in adobe holders pointing toward our car wheels. We're lucky it didn't get all our tires."

"But why?"

"You know as well as I." He nodded to the newspaper beside her, at the date, the headlines:

October 4th, 1983: United States,
Europe Silent!
The radios of the U.S.A. and Europe are dead. There is
a great silence. The War has spent itself.

It is believed that most of the population of the United States is dead. It is believed that most of Europe, Russia, and Siberia is equally decimated. The day of the white people of the earth is over and finished.

Strategies for Teaching Advanced Skills

Advanced skills as stated in the Chapter 1 law

Section 1471 of the Augustus F. Hawkins-Robert T. Stafford Elementary and Secondary School Improvement Amendments of 1988:

"'The term 'more advanced skills' means skills including reasoning, analysis, interpretation, problem-solving, and decision-making as they relate to the particular subjects in which instruction is provided under programs supported by this chapter."

"It seems then the need is to both teach thinking in the abstract to ensure that students are aware of specific aspects of thinking and also teach traditional courses in such a way as to illustrate the applicability of good thinking in those contexts and to provide daily opportunities to exercise it."

Ray Nickerson

DIMENSIONS OF THINKING
FRAMEWORK

I. Metacognition

    A. <u>Knowledge and Control of Self</u>

        1. Commitment
        2. Attitudes
        3. Attention

    B. <u>Knowledge and Control of Process</u>

        1. Types of knowledge important in metacognition

            a. Declarative knowledge
            b. Procedural knowledge
            c. Conditional knowledge

        2. Executive control of behavior

            a. Evaluation
            b. Planning
            c. Regulation

II. Critical and Creative Thinking

    A. <u>Critical Thinking</u>

        1. Dispositions

        2. Abilities

            a. Elementary Clarification
                1. Focusing on a question
                2. Analyzing arguments
                3. Asking and answering questions of clarification
                   and challenge

            b. Basic Support
                1. Judging the credibility of a source
                2. Observing and judging observation reports

            c. Inference
                1. Deducing and judging deductions
                2. Inducing and judging inductions
                3. Making and judging value judgments

            d. Advanced clarification
                1. Defining terms and judging definitions
                2. Identifying assumptions

            e. Strategy and tactics
                1. Deciding on an action
                2. Interacting with others

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B. Creative Thinking

    1. Basic Premises

        a. Creativity takes place in conjunction with intense desire and preparation.

        b. Creativity involves working on the edge rather than the center of one's capacity.

        c. Creativity requires an internal rather than external locus of evaluation.

        d. Creativity involves reframing ideas.

        e. Creativity can sometimes be facilitated by getting away from intensive engagement for awhile to permit free-flowing thought.

III. **Thinking Processes**

    A. Concept Formation

        1. Levels of concept formation

            a. concrete
            b. identity
            c. classificatory
            d. formal

        2. Principle formation

            a. Kinds of principles

                1. cause-and-effect
                2. correlational
                3. probability
                4. axiomatic

                    a. fundamentals
                    b. laws
                    c. rules

    B. Comprehension

    C. Problem Solving

        1. Processes-lists of unordered strategies

            a. Get the total picture
            b. Withhold judgment
            c. Create models
            d. Try changing the representation
            e. State questions verbally
            f. Be flexible
            g. Try working backwards
            h. Proceed in a way that allows you to return to partial solutions
            i. Use analogies and metaphors
            j. Talk about the problem

D. <u>Decision Making</u>

    1. Model for decision making
       a. State the goal
       b. Generate ideas
       c. Prepare a plan
       d. Take action

E. <u>Research</u> (Inquiry)

    1. Describing phenomena
    2. Formulating hypotheses
    3. Testing hypotheses

F. <u>Composition</u>

    1. Planning
    2. Translating
    3. Reviewing

IV. Core Thinking Skills

A. <u>Focusing Skills</u>

    1. Defining problems
    2. Setting goals

B. <u>Information Gathering Skills</u>

    1. Observing
    2. Formulating questions

C. <u>Remembering Skills</u>

    1. Encoding
    2. Recalling

D. <u>Organizing Skills</u>

    1. Comparing
    2. Classifying
    3. Ordering
    4. Representing

E. <u>Analyzing Skills</u>

    1. Identifying attributes and components
    2. Identifying relationships and patterns
    3. Identifying main ideas
    4. Identifying errors

F. <u>Generating Skills</u>

    1. Inferring
    2. Predicting
    3. Elaborating

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G. <u>Integrating Skills</u>

    1. Summarizing
    2. Restructuring

H. <u>Evaluating Skills</u>

    1. Establishing Criteria
    2. Verifying

V.   Relationship of Content-Area Knowledge to Thinking

A. Content-area learning as schema-dependent

B. Content areas as models and metaphors

C. Content areas as changing bodies of knowledge

D. Content areas as special approaches to investigation

HOW TO GET STARTED WITH THE THINK-ALONG PROCESS: GETTING STUDENTS TO BE ACTIVE CONSTRUCTORS OF MEANING

Roger Farr
Indiana University

WHAT IS A THINK ALONG?

A THINK ALONG is a teaching strategy that makes the invisible thinking process of reading visible. It is an attempt on the part of the teacher to model the thinking process that any good reader engages in when reading.

1. The teacher reads to the students while the students follow along with their own copy of the story.

2. It is best not to prepare a story ahead of time. Read as you do the first time. Of course, you will have to exaggerate some of the strategies.

3. Enjoy the story!

4. Use strategies, but don't identify them.

5. Just think aloud so the students will be able to think along.

USING A THINK ALONG

o Ask the students what kind of things you did as you were reading. Make a list on the chalkboard.

o Use the list on the chalkboard to make a printed list the students can use the next time to check the things you were doing.

o Discuss the things that were checked by the students. Ask if you did some things more than once.

o Ask the students if they do those things when they read. Talk about whether the Think-along strategies make the story more interesting.

o Ask students if they'd like to read to the class and use the strategies that you used. Call on volunteers.

o Ask the students to listen for strategies. Talk about the strategies that were used.

o Have students try out reading strategies with each other as they read in small groups.

o Have students tape record their reading aloud as they use the Think-along strategies.

o Ask students to listen to their tape recordings to see how many strategies they are using.

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Assessment of Reading Strategies

You need to talk to a student about his reading. Questions may
be asked before, during, and after the student read. You might
ask the student to tell you...

o   what a scene or character looks like.

o   what happens next--even after a story is finished.

o   If he changed his mind about story events or
         characters as he read.

o   If the story reminds him of anything that happened
         to him--or that he knows about.

Factors that Result in Poor Reading Comprehension

Poor comprehenders often seem not to:

--develop a clear focus or purpose for reading--especially before they start reading;

--form a good hypothesis about the text's meaning before they read;

--make mental images about what they are reading;

--monitor their comprehension (fix-up and change) to see that everything makes   sense;

--use their prior knowledge of similar information;

--summarize as they read;

--relate their reading to the immediate situation;

--relate their reading to previous experiences.

Strategies in Thinking Along

1. Guessing the meaning of words.

2. Using things you already know about.

3. Making predictions.

4. Changing predictions.

5. Using background to make sense.

6. Taking the part of a character.

7. Thinking about your opinions and reactions.

8. Getting your emotions involved.

9. Summarizing.

10. Making mental pictures.

11. Not deciding right away.

12. Re-reading.

And here's the most important point about Think-along strategies. You can't use Think-along strategies unless you are comprehending the story.

THINK ABOUT IT!

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Trends

Reading

ROGER FARR

Teaching Good Habits with Think-Alongs

In 1983 Beth Davey suggested an instructional process that she called *think-aloud* in which the teacher models the thinking strategies good readers use to construct meaning. Now often called *think-along*. the process has been adopted in a number of schools. In its recent reading textbook adoption, for example. the State of Virginia asked the reviewers to look for the process in the basals they were considering.

During the think-along process, the teacher reads a story, or an excerpt, aloud to students. who follow along in their copies. As the teacher reads, she *thinks-aloud* so the students can *think-along* with her, for instance. by:

● repeating or elaborating on details of how a scene or character looked,

● predicting what might happen next,

● admitting confusion over the meaning of a work or phrase,

● rereading portions to clarify meaning,

● verbalizing background knowledge that is being activated to help clarify meaning.

In brief, the teacher reads aloud and verbalizes the kind of things any good reader thinks about while trying to comprehend new material.

The Lettie Marshall Dent Elementary School in Mechanicsville. Maryland. has used the think-along approach for several years.[1] Teachers there. however. have expanded the process so that after students experience think-alongs with the teacher. they pair up and use think-alongs with each other. coaching each other after oral reading Students also use checklists to record quickly and easily the think-along strategies demonstrated by the teacher and special bookmarks to remind them of strategies to use during silent reading.

Teachers at the school have collected data about the think-along method that indicate students' behaviors have changed in several important ways:

1. The students' view of the reader's role has shifted from that of passive receiver of knowledge to one of active participant in constructing knowledge.

2. As students discuss and expand on the texts they are reading—without the use of teacher or text questions—

> ## As the teacher reads, she *thinks-aloud* so the students can *think-along* with her.

their verbal skills have increased. and they participate verbally in other classroom discussions with greater frequency and fluency.

3. As they monitor their comprehension through the think-along process, students are becoming more independent as readers.

The Lettie Marshall Dent School has also collected pilot test score data to determine the effectiveness of the process. The results suggest that students who are taught the think-along process score higher on standardized reading tests than comparable students who are not taught to "think along." Teachers in this school and in others across the country are also applying the think-along process to math, science, and social studies.

Certainly think-along is not a new teaching strategy. Good teachers have always employed comparable techniques. Think-along does, however. bring together some important current thinking about teaching as modeling. the use of metacognition, the emphasis on reading strategies rather than skills, and the application of previous knowledge to construct new meaning.□

[1]For more information. contact Patricia Russavage. Principal. Lettie Marshall Dent Elementary School. Mechanicsville. MD 20659.

Reference

Davey. B (October 1983) "Think-Aloud—Modeling the Cognitive Process of Reading Comprehension" *Journal of Reading* 44–4".

Roger Farr is Director. Center for Reading and Language Studies. and Associate Director. ERIC Clearinghouse on Reading and Communication Skills (whose resources were used to locate background information for this article). Smith Research Center, Indiana University. School of Education. Bloomington. IN 47408

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REQUEST
Reciprocal Questioning

Background Information

The ReQuest Procedure was developed by Anthony Manzo (1969) to guide students through as many sentences as necessary to enable the student to comprehend the rest of the passage successfully. The ReQuest Procedure is designed to improve the student's reading comprehension by providing an active learning situation for the development of questioning behaviors. The teacher encourages the student to ask questions about the text material and to set his/her own purposes for reading. The ReQuest Procedure was originally devised as a remedial procedure involving an individual student and the teacher, but it can also be utilized with pairs, teams, and/or small groups.

The procedure is indirectly diagnostic; by noting the kinds of questions the student asks for each kind of text structure, the teacher can determine whether the student is comprehending. Through teacher modeling of good questioning behavior, the student gains insight into how good readers ask themselves questions as they are reading. In addition, the procedure encourages the exchange of content information and the exchange of ideas.

Initiation

The ReQuest Procedure consists of the following steps:

1. Both the student and the teacher silently read a common selection from the text. The selection can be read one sentence at a time or a paragraph at a time.

2. After they have both read the passage, the student asks as many questions as possible. The teacher answers the questions clearly and completely.

3. Then it is the teacher's turn to ask the questions about the same sentence or paragraph, and the student answers as fully as possible. By forming questions which call upon the student's grasp of text structures, the teacher models good questioning strategies.

4. When the student has finished answering, teacher and student read the next sentence or paragraph and proceed as before.

5. When the student has processed enough information to make predictions about the rest of the selection, the exchange of questions stops. The teacher then asks directed reading type questions: "What do you think the rest of the assignment is about?" "Why do you think so?" The student reads the rest of the assignment.

6. The teacher facilitates follow-up discussion of the material.

Interaction

The teacher chooses a story or passage to be read by the student and the teacher; content area texts and prose materials work equally well. Both the student and the teacher need copies of the reading materials. This procedure can be done with an individual student and the teacher or with pairs, teams, and/or small groups. Students are told they will read a story and take turns asking each other questions over a specified section to improve their understanding of what they read.

Application

Students practice this technique on both short and long reading passages to develop self-monitoring skills. Students should be encouraged to ask questions that will stimulate interpretive or applied levels of thinking such as questions on the main idea of the passage.

As a follow-up on the development of questioning behaviors, the students are introduced to the Question-Answer Relationship (QAR). The QAR strategy helps students clarify the different sources of information available to answer questions during the ReQuest Procedure.

The teacher helps the student decide if the questions they asked can be answered from information IN-THE-BOOK or IN-MY-HEAD. The IN-THE-BOOK category can be expanded to include:

1.   answers that are stated in the text (RIGHT THERE).

2.   answers that require the reader to put together material from the text (THINK AND SEARCH).

The IN-MY-HEAD category can include answers that require:

i.   students to think about what they already know and how that information fits in with the information the author provides in the text (AUTHOR AND ME).

2.   questions that can be answered without reading the text (ON MY OWN).
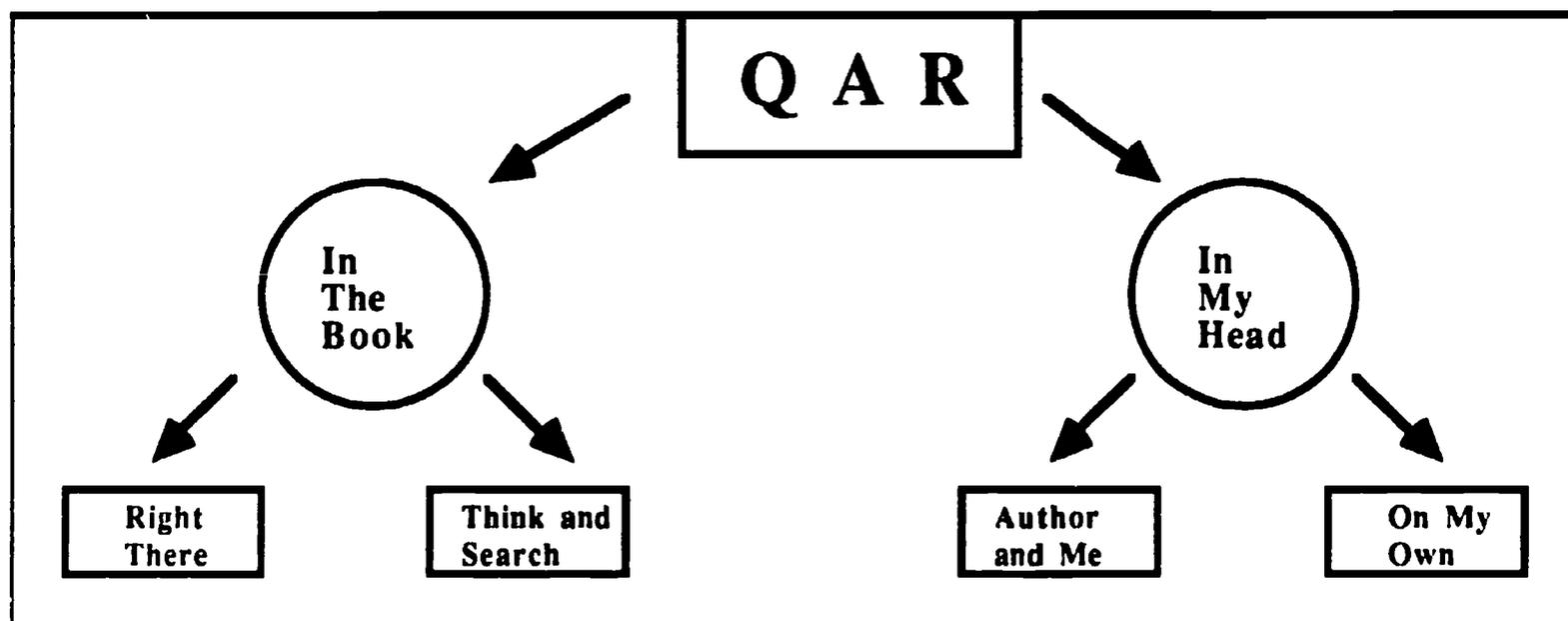
References:

Brown, A. L., Palincsar, A. S., and Armbruster, B. B. "Instructing comprehension-   fostering activities in interactive learning situations," in H. Mandl, N. L. Stein,   and T. Trabasso (Eds.), Learning and Comprehension of Text (pp. 255-286).
        Hillsdale, NJ: Erlbaum, 1984.

Manzo, Anthony. "Request procedure," Journal of Reading, 123-126, V. 13, 1969.

Palincsar, A. S. "The quest for meaning from expository text: A teacher-guided
        journey," in G. Duffy, L. Roehler, and J. Mason (Eds.), Comprehension
        Instruction: Perspectives and Suggestions (pp. 251-264). New York:
        Longman, 1984.

Raphael, T. E. "Question-answering strategies for children," The Reading Teacher,   V. 36, 1982.

Raphael, T. E. QARS Revisited. Newark, DE: International Reading Association,   1985.

Problem Solving Strategies:

1. Get the total picture; don't get lost in detail.

2. Withhold judgment; don't commit yourself too early.

3. Create models to simplify the problem, using words, pictorial representations, symbols, or equations.

4. Try changing the representation of the problem.

5. State questions verbally, varying the form of the question.

6. Be flexible; question the flexibility of your premises.

7. Try working backwards.

8. Proceed in a way that permits you to return to your partial solutions.

9. Use analogies and metaphors.

10. Talk about the problem.

Source: *Dimensions of Thinking*
(ASCD)

Cooperative Group Activity

Here is a map of the United States with 11 cities marked with dots. An airline has routes between some of the cities as shown by the route lines on the map.
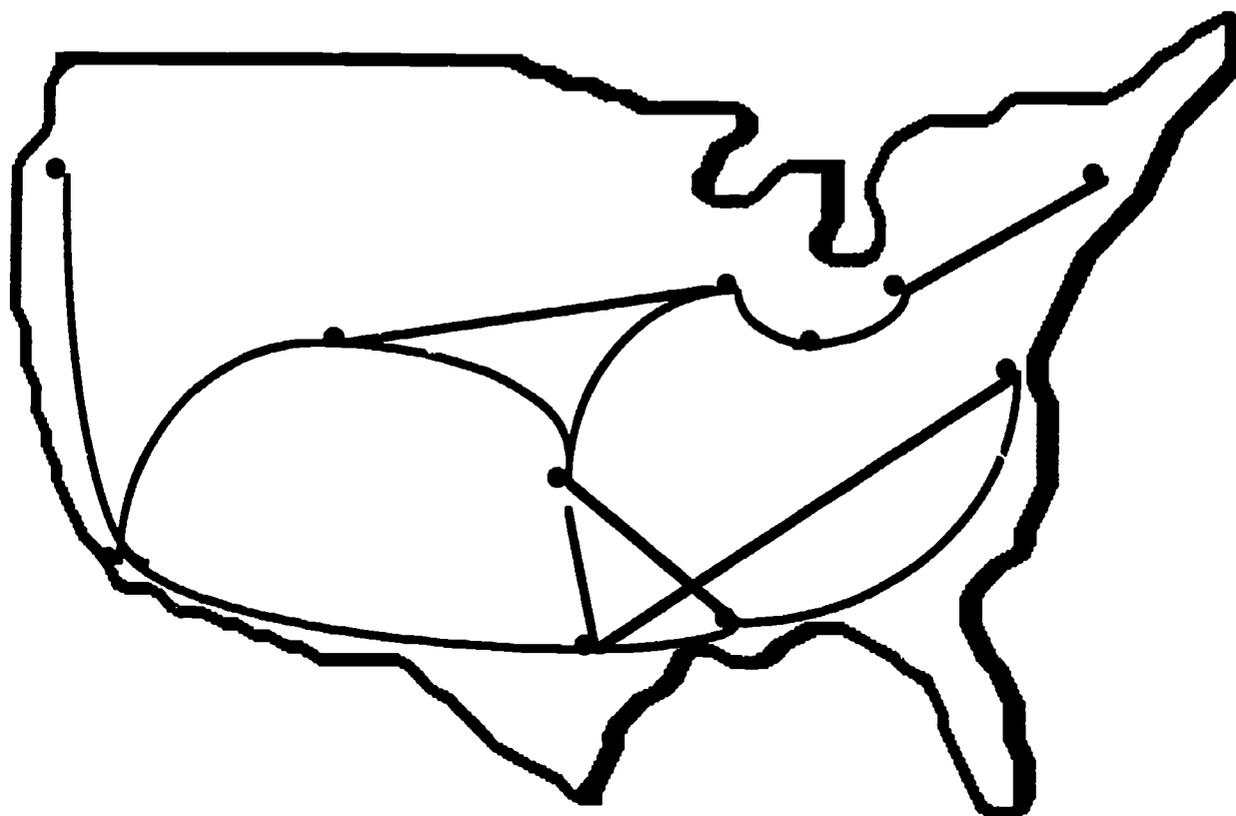
The airlines employed 11 new people to sit in the central towers of 11 cities. The people are Alex, Linda, Nancy, Debbie, Elvis, Frances, Sheila, Bill, Lisa, Lou, and Ron. The two people in the cities with connecting routes will be talking to each other a great deal, so it would be helpful if they were friends already. Here are the pairs of people who are friends:

Alex - Linda	Bill - Frances	Lisa - Ron	Lou - Lisa
Sheila - Lou	Sheila - Lisa	Debbie - Elvis	Lou - Nancy
Debbie - Lisa	Alex - Sheila	Ron - Elvis	Debbie - Ron
Nancy - Bill	Alex - Debbie		

The cooperative group tasks:

1. Place the eleven people in the eleven cities so that the people in connecting cities are friends.

2. Are there other ways to assign the people to the cities and still have friends in adjacent cities.

3. What cities do you think are designated by the dots on the map?

A WORKABLE SET OF HEURISTICS
...to use in teaching problem solving

developed by Stephen Krulik & Jesse Rudnick

What are heuristics?

Problem solving is a *process*! A process that starts w: ,n the initial encounter with the problem is made and ends when the obtained answer is reviewed in l;,nt of the given information. Children must learn this *process* is they are to deal successfully with the pivulems they will meet in school and elsewhere. This process is complex and difficult to learn. It consists of a series of tasks and thought processes that are loosely linked together to form what is called a *set of heuristics* or a *heuristic pattern*. They are a set of suggestions and questions that a person must follow and ask themselves in order to resolve a dilemma.

There is no single set of heuristics for problem solving. Over the years, several sets of heuristics have been developed to assist students in problem solving. In the main, they are quite similar. Which set a student follows does not really matter. What does matter is that students learn some set of carefully developed heuristics, and that they develop the habit of applying these heuristics in all problem-solving situations.

Krulik and Rudnick (1987) suggest a "workable set of heuristics" that has proven to be successful with students and teachers at all levels of instruction.

1. **Read**
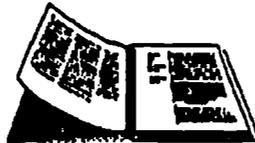
2. **Explore**
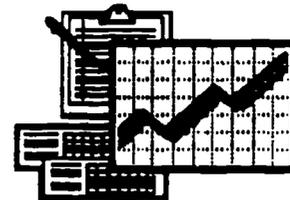
3. **Select a Strategy**

4. **Solve**
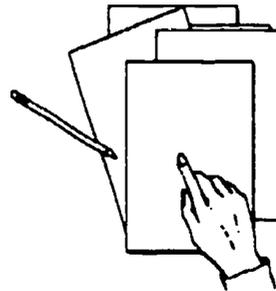
5. **Review and Extend**

Read

1. Note the key words.

2. Describe the problem setting and visualize the action.

3. Restate the problem in your own words.

4. What is being asked for?

5. What information is given?

Explore
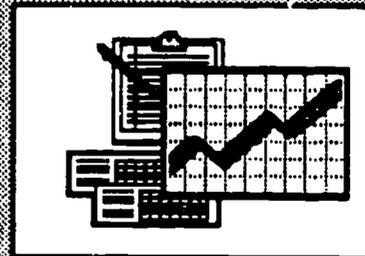
1. Organize the information.

2. Is there enough information?

3. Is there too much information?

4. Draw a diagram or construct a model.

5. Make a chart or a table.

Select a Strategy

1. Pattern recognition

2. Working backwards

3. Guess and test

4. Simulation or experimentation

5. Reduction/solve a simpler problem

6. Organizec listing/exhaustive listing

7. Logical deduction

8. Divide and conquer

Solve

1. Carry through your strategy

2. Use computational skills

3. Use geometric skills

4. Use algebraic skills

5. Use elementary logic
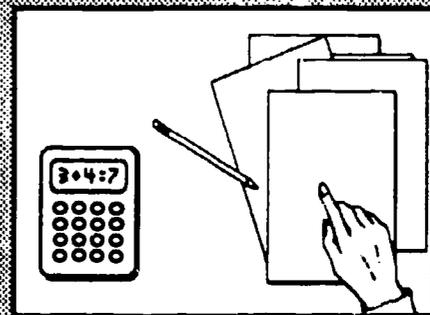
Review and Extend

1. Verify your answer.

2. Look for interesting variations on the original problem.

3. Ask "What if...?" questions.

4. Discuss the solution.

Source: Krulik, S. & Rudnick, J.A.   Problem Solving: A Handbook for Teachers.
          Allyn & Bacon, Inc., 1987.

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RECIPROCAL TEACHING

developed by Annemarie Palincsar &
Ann Brown

Definition

Reciprocal teaching is an instructional activity that takes place in the form of a dialogue between teachers and students regarding segments of text. The dialogue is structured by the use of four strategies: *summarizing, question generating, clarifying,* and *predicting.* The teacher and students take turns assuming the role of teacher in leading this dialogue.

Strategies

Summarizing provides the opportunity to identify and integrate the most important information in the text. Text can be summarized across sentences, across paragraphs, and across the passage as a whole. When students first begin the reciprocal teaching procedure, their efforts are generally focused at the sentence and paragraph levels. As they become more proficient, they are able to integrate at the paragraph and passage levels.

Question generating reinforces the summarizing strategy and carries the learner one more step along in the comprehension activity. When students generate questions, they first identify the kind of information that is significant enough to provide the substance for a question. They then pose this information in question form and self-test to ascertain that they can indeed answer their own question. Question generating is a flexible strategy to the extent that students can be taught and encouraged to generate questions at many levels.

Clarifying is an activity that is particularly important when working with students who have a history of comprehension difficulty. These students may believe that the purpose of reading is saying the words correctly; they may not be particularly uncomfortable that the words, and in fact the passage, are not making sense. When the students are asked to clarify, their attention is called to the fact that there may be many reasons why text is difficult to understand (e.g., new vocabulary, unclear referent words, and unfamiliar and perhaps difficult concepts). They are taught to be alert to the effects of such impediments to comprehension and to take the necessary measures to restore meaning (e.g., reread, ask for help).

Predicting occurs when students hypothesize what the author will discuss next in the text. In order to do this successfully, students must activate the relevant background knowledge that they already possess regarding the topic. The students have a purpose for reading: to confirm or disprove their hypotheses. Furthermore, the opportunity has been created for the students to link the new knowledge they will encounter in the text with the knowledge they already possess. The predicting strategy also facilitates use of text structure as students learn that headings, subheadings, and questions embedded in the text are useful means of anticipating what might occur next.

In summary, each of these strategies was selected as a means of aiding students to construct meaning from text as well as a means of monitoring their reading to ensure that they are in fact understanding what they read.

Initiation

Reciprocal teaching should be introduced to students with some discussion regarding the many reasons why text may be difficult to understand, why it is important to have a strategic approach to reading and studying, and how the reciprocal teaching procedure will help the students understand and monitor their understanding as they read.

The students are then given an overall description of the procedure, emphasizing that it takes the form of a dialogue or discussion about the text and that everyone takes a turn assuming the role of teacher in this discussion. To illustrate, the person who is assuming the role of teacher will first ask a question that he or she thinks covers important information that has been read. The other members of the group answer that question and suggest others they may have thought of. The "teacher" then summarizes the information

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read, points out anything that may have been unclear, leads the group in clarifying, and, finally, predicts the upcoming content.

To ensure a minimal level of competency with the four strategies, the students receive practice with each of them. For example, the students summarize their favorite movie or television show. They then identify main idea information in brief and simple sentences and graduate to more complex paragraphs that contain redundant and trivial information. Each strategy receives one day of introduction.

Application

After the students have been introduced to each of the strategies, the dialogue begins. For the initial days of instruction, the adult teacher is principally responsible for initiating and sustaining the dialogue. This provides the opportunity for the teacher to provide further instruction and to model the use of the strategies in reading for meaning. The adult teacher may wish to call upon more capable students who will serve as additional models, but it is important that every student participate at some level. For some students, this participation may be such that they are noting one fact that they acquired in their reading. This is a beginning, and over time the teacher, through modeling and instruction, can guide these students toward a more complete summary.

As students acquire more practice with the dialogue, the teacher consciously tries to impart responsibility for the dialogue to the students while he or she becomes a coach, providing the students with evaluative information regarding the job they are doing and prompting more and higher levels of participation.

Source: Annemarie Sullivan Palincsar, "Reciprocal Teaching," *Teaching Reading as Thinking*, ASCD.

Research Base:

Brown, A., & Palincsar, A.S. (1982). Inducing strategic learning from texts by means of informed, self-control training. *Topics in Learning and Learning Disabilities*, 2(1), 1-17.

Palincsar, A.S., & Brown, A. (1985). Reciprocal teaching: Activities to promote "read(ing) with your mind." In T.L. Harris & E.J. Cooper (Eds.), *Reading, thinking, and concept development: Strategies for the classroom*. New York: The College Board.

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K-W-L GROUP INSTRUCTION STRATEGY

developed by Donna Sederburg Ogle

Definition

K-W-L is a strategy that models the active thinking needed when reading expository text. The letters K, W, L stand for three activities students engage in when reading to learn: recalling what they **KNOW**, determining what they **WANT** to learn, and identifying what they **LEARN** as they read.

This strategy is designed to help students develop a more active approach to reading expository material. Teachers first model and stimulate the kinds of thinking needed for learning and then give students individual opportunities to write out what they know, what questions they want answered, and what they have learned from reading the text. In this way, the benefits of group instruction are combined with individual student commitment and responsibility.

The strategy was developed to translate current research findings about the active, constructive nature of reading into an instructional lesson format. In classroom testing, K-W-L has been shown to be an effective tool to help students become more active thinkers and to help them remember better what they read (Ogle, 1986). It has also been useful in helping teachers better communicate the active nature of reaidng in group settings.

The strategy is designed for group instruction and can be used with either whole classes or smaller groups. It can be used in all curricular area and at all grade levels where students are reading expository material.

Procedures

Preparation. The teacher must prepare by reading the material, determining a key content concept that can elicit the most pertinent knowledge about the topic and by producing student worksheets. (See samples following description.)

Group Instruction. The initial group portion of this strategy involves three basic components. First, the teacher engages students *in a discussion of what they as a group already know about the concept the teacher has selected to introduce the lesson.* The teacher lists this information on the chalkboard or overhead projector. When disagreements and questions emerge, the teacher notes them and suggests that students may want to include them on the center column as questions they want to have answered.

Second, after students have volunteered all that they can think of about the concept, they should be asked to *categorize the information they have generated.* The teacher may need to identify one general category that incorporates two or more pieces of information on the board to model the building of chunks or categories. (At this point, a teacher may also want to use a *semantic map* as described in preceding sections of the handout to categorize information.)

Third, after the students are somewhat familiar with this process, they should be asked to *anticipate the categories of information they would expect to have included in an article on the topic.* The categories of information identified will be useful in processing the information they read and in future reading of a similar nature.

Individual reflection. After the group introduction to the topic, students should be asked individually to *write on their own worksheet what they feel confident they KNOW about the concept.* They can also write down the categories they think are most likely to be included. At this time, the teacher should help students raise those questions that have emerged during the discussion or that come from thinking of the major categories of information they expect to find. Each students should be able to *think of at least three questions or issues that they WANT to learn about as they read and should write those on their individual worksheets.*

Reading.   Students should be directed to read the text once they have focused both on what they know and what they want to find out from reading. Depending on the length and difficulty of the text and the class composition, the text can either be read as a unit or can be broken into sections for reading and discussion. As they read, students should use their worksheet, jotting down information they learn as well as new questions that emerge.

Assessment of learning. The final step in the process is to engage the students in *a discussion of what they have learned from reading*. Their questions should be reviewed to determine how they were resolved. If some have not been answered satisfactorily, students should be encouraged to continue their search for information.

References:

Anderson, R.C. (1977). The notion of schemata and the educational enterprise. In R.C. Anderson, R.J. Spiro, & W.E. Montague (Eds.), *Schooling and the acquisition of knowledge*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Anderson, C.W., & Smith, E.L. (1984). Children's preconceptions and content-area textbooks. In G. Duffy, L. Roehler, and J. Mason (Eds.), *Comprehension instruction: Perspectives and suggestions*. New York: Longman.

Ogle, D. (1986). The K-W-L: A teaching model that develops active reading of expository text. *The Reading Teacher, 39*, 564-570.

SEMANTIC MAPPING

<u>Background Information</u>

Semantic maps are diagrams which help students see how words are related to each other. The procedure activates and builds on student's prior knowledge and generally involves brainstorming and discussion of how new information links to this prior knowledge. The maps can be used for vocabulary and comprehension development as a prereading or postreading activity.

Semantic mapping is not a new instructional strategy; for a number of years it has been known as "semantic webbing", "plot mapping" and "semantic networking". An early reference on semantic mapping per se was a 1971 <u>Journal of Reading</u> article by M.B. Hanf entitled "Mapping: A technique for translating reading into thinking". However, leading proponents who helped popularize this approach were Dale Johnson and P. David Pearson who described and discussed semantic mapping in their 1978 books <u>Teaching Reading Vocabulary</u> (updated in 1984) and <u>Teaching Reading Comprehension</u>. A number of research studies have validated the effectiveness of semantic mapping, contributing to the increased support of this as an effective instructional strategy.

<u>Initiation</u>

While there are a number of variations to semantic mapping, the general steps involved are:

1. Write the chosen vocabulary word or story topic on the blackboard. Draw a box or circle around that word/term.

2. Encourage students to think of as many words or ideas as they can that relate to the selected word or topic.

3. Students may:

    *   write their ideas on paper and then share those ideas in group discussion;
    *   brainstorm ideas in a small group to share in large group discussion; or
    *   orally share ideas together to generate a class semantic map.

4. Students' ideas are listed on the semantic map in categories which organize the words in a reasonable and related manner. These details or related words/ideas are written around the main word/topic.

5. Discussion of the semantic map is perhaps the most important part of the activity. Here students see how words/ideas are related, learn new words and find new meanings for words they already know. During discussion the teacher will focus on the ideas most appropriate to the lesson being taught, add new related ideas to the map, and help students to identify those ideas which do not appropriately fit the map.

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SEMANTIC MAP
...for vocabulary development

Initiation

The instructor writes the word or concept to be studied on the blackboard and asks students to think of as many words as they can related to that word/concept. An alternate question to initiate the activity is "What do you think of when you see the word (topic)?"

Interaction

In small groups or as a whole group, the students brainstorm a list of words related to the key word/concept. These words are written on a sheet of paper or on the blackboard in a list.

Application

Construct the group semantic map by writing the brainstormed words in categories around the key word/concept   Have students suggest labels for these categories, if possible. The instructor may add words or ideas to appropriately complete the group semantic map. Discuss the group's semantic map, pointing out relationships and differences among words. Have students point out new words they learned from this map as well as new meanings for words they already knew.

Expansion

Have students look for words in the semantic map as they read an appropriate story. Students may also be asked to write a paragraph or short story. Students may also be asked to write a paragraph or short story using the words/concept from the semantic map.

SEMANTIC MAP
...before reading

The activity integrates information from several sources to build students' background knowledge for a topic to be studied. The instructor prepares for this activity by choosing several materials which provide information on the topic. These materials could include posters, pictures, maps, easy-to-read trade books, filmstrips, various high-interest, low-vocabulary reading materials and textbook or basal materials.

Initiation

The teacher writes the topic on the blackboard, draws a circle around the word, and tells students this topic will be studied. The teacher lists key vocabulary words on the blackboard, including a context phrase or sentence for each word.

Interaction

Write each key word on the semantic map as a category heading. Discuss each word, listing details students already know about these category headings in red chalk. Ask students to skim the basal textbook to find the key words in context. Discuss the uses/meanings of those words in the text and write those ideas on the semantic map in white chalk. (The different colored chalk indicates information from different sources.) Have students review the other materials (e.g., posters, filmstrips, library books) to find additional information which fits or relates to the categories on the semantic map. Write these ideas on the map in blue chalk.

Application

Have students read the textbook material, stopping at the end of each section to add information to the semantic map. Write this information in white chalk to indicate that the information came from the textbook. When the semantic map is completed, the teacher uses the map to help the students summarize or recap the information about the topic.

Expansion: Students use the semantic map to write a summary of the important facts and details about the topic.

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SEMANTIC MAP
...after reading

Initiation

Tell students they are going to read a story about "(topic)". The teacher should provide enough context for the upcoming reading to help students make predictions about what they think will happen in this story. Introduce any key vocabulary words in context and then have students read the story silently.

Interaction

Write the title of the story in the center of the blackboard and draw a circle around it. On lines drawn from the circle, write key concepts or themes from the story. For example, these concepts/themes can include how the characters look, important problems and episodes in the story, how the characters feel or react, and outcomes of the story. Students suggest ideas for each of these concepts/themes based on what they remember from reading the story. Their ideas are written on the map.

Application

The teacher and students recap the story by reviewing the semantic map. Students then reread the story (orally or silently) to look for other important information that was not included on the map. As students find new information through this guided reading, it is added to the map.

Expansion

Students use the completed map to guide retelling of the story. If appropriate, have students role-play or act out the story. The map can also be used to structure a writing activity in which students write a summary of the story using the information on the map.

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Examples of Using More Advanced Thinking Skills
In Chapter 1 Classroom Situations
(based on categories from Dimensions of Thinking, ASCD)

	READING	MATHEMATICS
Metacognition (Knowledge and control of self; knowledge and control of process)	Students write/predict the ending or beginning to a story. Student decides to reread a paragraph to make sure s/he understands the author's intent.	Students discuss and plan a method for solving a problem. One student explains to another why s/he chose to solve a problem using a certain strategy.
Critical and Creative Thinking (Focus is on how the process is carried out)	Students look for other solutions to a problem than how it is resolved in a story.	Students look for the pattern used by another for generating a sequence of numbers. Students generate their own sequence of numbers using a pattern of their choice.
Thinking Processes (Broader in scope; longer time to complete; "macro" processes; overlap, semi-ordered)	Students write their own story based upon one character of their choice from a different story. They must plan the story, write the story, and explain why they feel the new "fits" the character.	Students explore polygons with 3, 4, 5, 6, 7, and 8 sides by looking for relationships between the number of sides and other properties. They use this information for predicting patterns when there are more sides.
Core Thinking Skills (Essential to other dimensions; depend on process and content area; microprocess)	After reading a story, students are paired with the stated purpose of asking each other questions--to clarify, justify, add information.	Students draw pictures to represent a problem situation. Students use Cuisenaire rods to help them solve computation problems.

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Creating a Climate for **T**hinking

Listening to Students

Appreciating Individuality and Openness

Encouraging Open Discussion

Promoting Active Learning

Accepting Students' Ideas

Allowing Time to Think

Nurturing Confidence

Giving Facilitative Feedback

Appreciating Students' Ideas

Source: Raths, Louis E. et al., (1986) Teaching for Thinking
           Teachers College, Columbia University, N.Y.

And Remember...

Thinking is basic
to the basics!
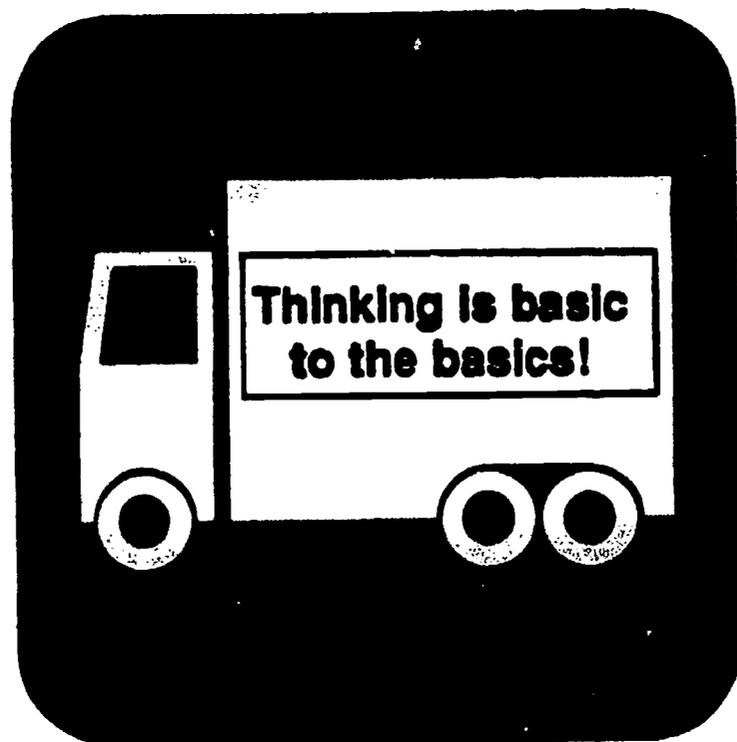
THINKING/WRITING:

FOSTERING CRITICAL THINKING SKILLS THROUGH WRITING

1. Initial comprehension leading to

2. Preliminary interpretations, followed by

3. A reexamination of the text in light of these interpretations, leading to

4. Extended and documented interpretation.

THE STUDENT'S PROCESS

THE WRITING PROCESS

PREWRITING · PRECOMPOSING · WRITING · SHARING · REVISING · EDITING · EVALUATION

The Writing Process

THE THINKING PROCESS

KNOWLEDGE · COMPREHENSION · APPLICATION · ANALYSIS · SYNTHESIS · EVALUATION

The Thinking Process

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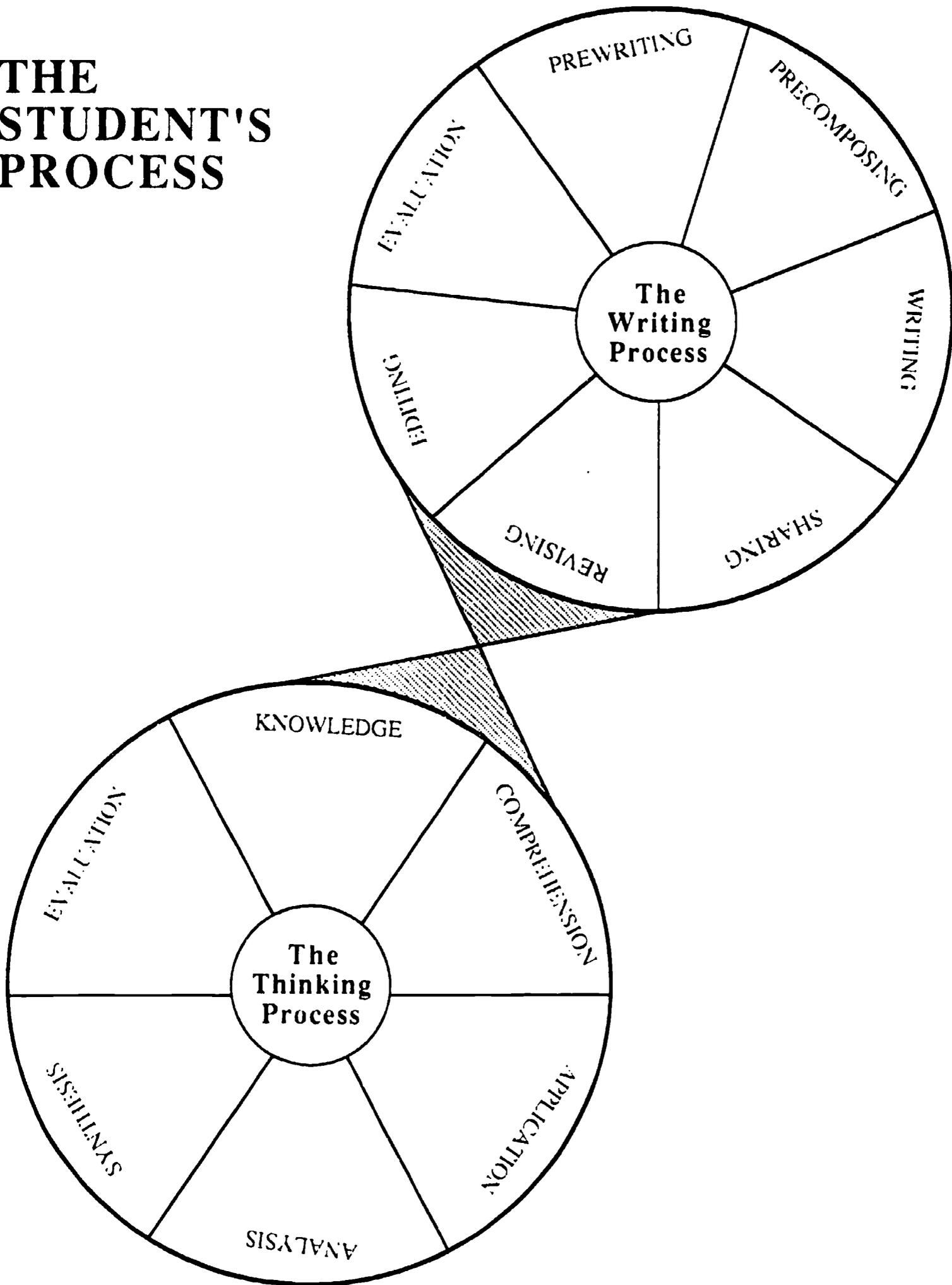
TAXONOMY OF THINKING LEVELS

LEVEL	CUE WORDS	
KNOWLEDGE **RECALL** Remembering previously learned material	OBSERVE REPEAT LABEL/NAME CLUSTER LIST RECORD MATCH	MEMORIZE RECALL RECOUNT SORT OUTLINE (FORMATSTATED) DEFINE

COMPREHENSION
 	
TRANSLATE
 	
Grasping the meaning of material
	RECOGNIZE
	LOCATE
	IDENTIFY
	RESTATE
	PARAPHRASE
	TELL
	DESCRIBE
	REPORT
		EXPRESS
		EXPLAIN
		REVIEW
		CITE
		DOCUMENT/
		  SUPPORT
		SUMMARIZE
		PRECIS
		  ABSTRACT

APPLICATION
 	
GENERALIZE
 	
Using the learned material in new and concrete situations
	SELECT
	USE
	MANIPULATE
	SEQUENCE
	ORGANIZE
	IMITATE
	FRAME
	SHOW/
	  DEMONSTRATE
		HOW TO
		APPLY
		DRAMATIZE
		ILLUSTRATE
		TEST OUT/SOLVE
		IMAGINE/
		  INFORMATION
		  KNOWN

LEVEL	CUE WORDS	

ANALYSIS
 	
Breaking down material into its component parts so that it may be more easily understood
	EXAMINE
	CLASSIFY
	DISTINGUISH/
	  DIFFERENTIATE
	OUTLINE
	(NOFORMAT GIVEN)
	MAP/RELATE TO
	CHARACTERIZE
	QUESTION
	INFER
		COMPARE/CONTRAST
		  (SIMILARITIES/
		  DIFFERENCES)
		RESEARCH
		INTERPRET
		DEBATE/DEFEND
		REFUTE
		CONCLUDE/DRAW
		  CONCLUSIONS
		ANALYZE

SYNTHESIS **COMPOSE** Putting material together to form a new whole	PROPOSE PLAN COMPOSE FORMULATE DESIGN	CONSTRUCT EMULATE IMAGINE/ SPECULATE CREATE INVENT

EVALUATION
 	
JUDGE
 	
Judging the value of material for a given purpose
	COMPARE
	  PRO/CONS
	PRIORITIZE/
	  RANK
	JUDGE
	DECIDE
	RATE
	EVALUATE
		CRITICIZE
		ARGUE
		JUSTIFY
		CONVINCE
		PERSUADE
		ASSESS
		VALUE
		PREDICT

The Levels of Questions
The Grapes of Wrath

Knowledge

Give four reasons why the farmers had to abandon their homes and head West. Use quotes from the text to support your reasons.
(List, Record)

Comprehension

Explain why Steinbeck compares the banks who foreclose on the farmers to a "monster."
(Paraphrase, Explain, Discuss)

Application

Steinbeck says, "The people in flight from the terror behind--strange things happen to them, some bitterly cruel and some so beautiful that the faith is retired forever." Please illustrate his statement by giving one example of a cruelty and one example of a kindness that are representative of the events of the novel as a whole.
(Choose, Apply, Illustrate)

Analysis

Critics have often observed that the "Turtle Chapter" (Chapter Three) of The Grapes of Wrath is a mirror of the larger novel. Examine this chapter carefully and discuss its symbolic significance.
(Examine, Compare, Draw Conclusions, Analyze)

Synthesis

After Rose of Sharon's baby is stillborn, Uncle John sets it in an apple box and sends it downstream saying, "Go down and tell 'em. Go down in the street 'an rot 'an tell 'em that way. That's the way you can talk." Write an epitaph for Rose of Sharon's baby that puts into words the message that Uncle John wants to convey.
(Compose, Create, Speculate)

Evaluation

Is the end of The Grapes of Wrath an optimistic novel in which the human spirit triumphs or a pessimistic novel in which the will to endure is extinguished? Please refer to specific scenes in the novel to support you point of view.
(Judge, Argue, Justify)

Levels of Questions
Tom Sawyer

Questions	Thinking Level	Specific Skills
Compare Tom's sales technique to the Mary Poppin's motto "A spoonful of sugar makes the medicine go down." How are they similar?		
What is whitewashing? Explain the process		
Imagine Tom in an occupation where salesmanship skills such as his are necessary (i.e. used car salesman, magazine salesman, fuller brush man.) What would Tom's sales pitch be?		
What things did Tom say and do to convince his friends to whitewash for him?		
What are the pros and cons of Tom's approach from the consumer's point of view?		
Place yourself in the position of one of Tom's friends. What would you give Tom in order to convince him that you should be able to whitewash?		

QUESTIONS THAT FOSTER CRITICAL THINKING SKILLS

Focus: A cup

KNOWLEDGE
What is this called? *(Labeling)*

COMPREHENSION
What is it normally used for? *(Identification, Explanation)*

APPLICATION
Can you demonstrate what one does with a cup? *(Apply, Dramatize)*

ANALYSIS
Why are cups and other things we drink out of round at the top rather than square, triangular or flat on one side and round at the other? *(Examine, Break Down, Classify)*

SYNTHESIS
Having looked at what we commonly use for, what new or different functions can you create for this form? Can you give it a new name? *(Imagine, Formulate, Create)*

EVALUATION
Which of these new functions are the most feasible for everyday use and why? *(Judge, Rate, Justify)*

Essay Exam Questions
UCI

Trace the relationship between the Soviet Union and the United States from 1914 to the present. In what ways did economic and political competition affect domestic politics in both countries? Consider wars, the Bolshevik Revolution, socialism, capitalism, economic polocoes, imperialism, expansionism.

<div align="right">History 29C</div>

Write a well-organized, coherently argued essay of 2 1/2 to 3 pages in which you analyze the function of the description of the seasons in Part II (Lines 491-535) of <u>Sir Gawain and the Green Knight</u> within the context of the poem as a whole, keeping in mind that a major characteristic of the poem as a "romance" is its way of limiting time to put it in a strict cyclical pattern.

<div align="right">Humanities Core Course</div>

"What's good for General Motors is good for America." Discuss.

<div align="right">Subject A Exam</div>

THE TEACHER'S PROCESS

The Writing Process

- PREWRITING
  - Oral improvisation
  - Clustering
  - Discussing
  - Dramatizing
  - Experiencing
- PRECOMPOSING
  - Defining
  - Modeling
  - Framing
  - Outlining
  - Planning
- WRITING
  - Organizing
  - Translating
  - Introducing
  - Developing
  - Concluding
- SHARING
  - Listening
  - Responding
  - Supporting
  - Suggesting
  - Critiquing
- REVISING
  - Re-Thinking
  - Supplementing
  - Clarifying
  - Re-Framing
  - Deleting
- EDITING
  - Correcting
- EVALUATION
  - Responding
  - Assessing
  - Critiquing
  - Judging
  - Rating

The Thinking Process

- KNOWLEDGE
  - Recalling
  - Brainstorming
  - Defining
  - Recounting
  - Sorting
- COMPREHENSION
  - Understanding
  - Restating
  - Summarizing
  - Recognizing
- APPLICATION
  - Dramatizing
  - Organizing
  - Manipulating
  - Using
  - Selecting
- ANALYSIS
  - Comparing/
  - Contrasting
  - Classifying
  - Characterizing
  - Examining
  - Returning
- SYNTHESIS
  - Creating
  - Proposing
  - Constructing
  - Emulating
  - Designing
- EVALUATION
  - Justifying
  - Ranking
  - Persuading
  - Predicting
  - Rating

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TITLE

LESSON   A brief description of the final writing assignment.

OBJECTIVES   THINKING: Specific skills from Bloom's taxonomy.

WRITING: Specific writing skills utilized in the writing.

THE PROCESS

PREWRITING   Activities and experiences that capture students' attention and promote student confidence in themselves as writers, that generate ideas setting the stage for the prompt, that give practice in higher level thinking skills.

PROMPT   A specific writing task.

PRECOMPOSING   Activities and experiences that promote the development of a plan for writing to a particular prompt and provide practice in the skills taught in the lesson.

WRITING   The first draft Aims for fluency, for rapid, rough completion, for discovery of content rather than refinement of thought.

SHARING   Writing being read by another that allows for input to be refined by the writer.

REVISING   Rethinking, re-seeing, reformulating the content and clarity of the first draft, incorporating the sharing.

EDITING   Proofreading the surface of the writing to ensure that it conforms to standards of correctness.

EVALUATION   Judging the writing to determine if it satisfies the writer and reader as well as fulfills the requirements of the prompt.

DEFINED

SEASHELLS AND SIMILES:
A MEDITATION ON A SHELL

LESSON: After observing a shell, students write an imaginative poem or paragraph using comparisons (similes and metaphors*).

OBJECTIVES: <u>Thinking Skills</u>
Students practice the SYNTHESIS skills of IMAGINING and CREATING.

<u>Writing Skills</u>
Students practice using comparisons (similes and metaphors) in descriptive writing.

THE PROCESS

This lesson takes approximately six days in a poetry/creative writing unit or in a science unit. Optimally, every student chooses a shell of his or her own from a varied collection kept on display throughout the unit, but students may also share shells. The teacher needs a large conch and a snail-like shell for demonstration. (The lesson will also work with rocks, pressed leaves, or any other natural object collection.)

PREWRITING:

DAY 1

Tell students: This week we are going to practice observing something closely and describing it using comparisons. Each of you is going to choose one of these shells to observe and to write about. First, I want us all to look at one shell together. (Use the large conch as a model.)

Students gather in a close circle to observe the shell. Record all their answers in a list or cluster on something that can be saved for other days. Accept both single words and similes -- i.e. It's like . . .

---

* Since the intent of this lesson is to encourage and practice thinking in unique comparisons, the teacher may or may not choose to use or discriminate between the terms simile and metaphor at this grade level.

Ask students: What do you notice right away about the shell? (Clarify students' responses throughout the following discussions by asking them what part of the shell gives them their idea, but do not push if anwers are not forthcoming.)

Pass the shell around, urging students to handle the shell but take some care because a shell will break if dropped.

Ask: What do you notice now about the shell?
        Does the shell have any sound? (Have them hold up the shell to their ears as they pass it.)
        Does the shell have any smell?
        How do you think the shell might taste?

A sample cluster might look like this:
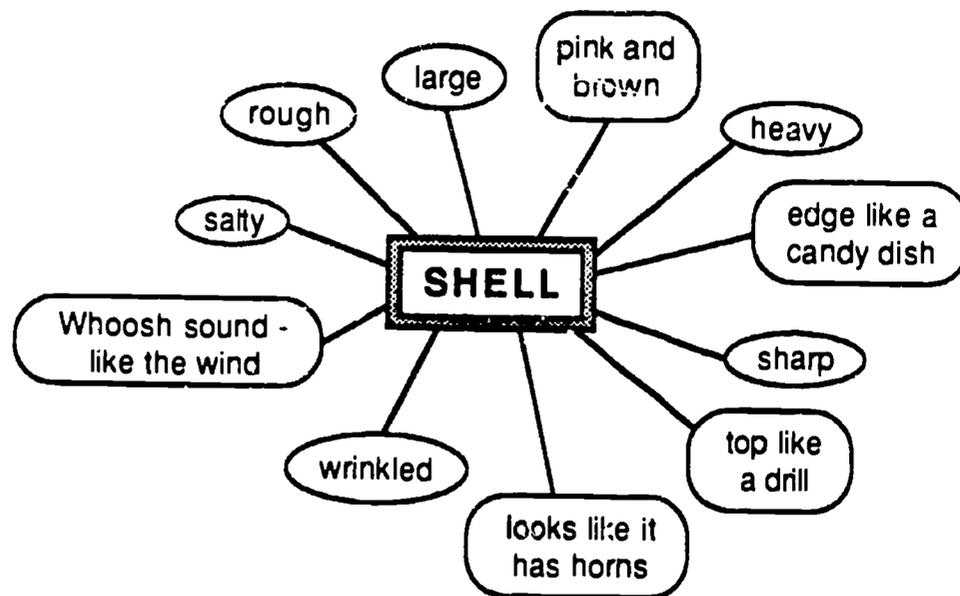
Students select the shell that will be theirs throughout the project

Now tell students: I want you to practice observing your own shell just like we did with the class. Make a cluster of as many things · see, touch, hear, taste, and smell as possible. You can use any of the words we came up ...th in the class as well as all the new words you think of. We will use the lists again tomorrow.

DAY 2

Review what students observed the day before by having some students show their shells and read their clusters to the class. Have all the students add to their individual clusters any new observations or words they think of from listening to the discussion.

Give students another experience in observing the shell by having them draw their shells from at least two angles. Tell students the drawing will help them see the lines and shapes in the shell they may not yet have noticed. Eliminate drawing anxiety by telling them that if they like their results they may choose to use their drawing as an illustration for the writing assignment to follow, but they will not be required to display it.

DAY 3

Tell students: Today you'll be learning about a different kind of observing by reading what Anne Morrow Lindbergh wrote to describe a shell. Explain that Lindbergh uses not just her eyes and senses to see what is there but also her imagination. She looks at the shell and "meditates" -- lets her mind think deeply, wonder and wander, and come up with new ways to see the shell.

Before reading the passage, develop the necessary vocabulary. For each of the words, ask if anyone knows what it means. Define it for them if necessary. Likewise ask them to tell you some things that might be described by the words:

glossy	apex
horse chestnut	solitary
opaque	serene
symmetrical	

Pass out the passage. Show the students a snail shell resembling the one Lindbergh describes while you read the passage aloud with them, stopping at the er⁻ of each phrase or sentence to relate the description to the shell in your hand. From Gift ⌐u⌐ɪ the Sea by Anne Morrow Lindbergh (Vintage Books, 1978):

This is a snail shell, round, full and glossy as a horse chestnut. Comfortable and compact, it sits curled up like a cat in the hollow of my hand. Milky and opaque, it has the pinkish bloom of the sky on a summer evening, ripening to rain. On its smooth symmetrical face is pencilled with precision a smooth spiral, winding inward to the pinpoint center of the shell, the tiny dark core of the apex, the pupil of the eye. It stares at me, this mysterious single eye -- and I stare back.

Now it is the moon, solitary in the sky, full and round, replete with power. Now it is the eye of a cat that brushes noiselessly through long grass at night. Now it is an island, set in ever-widening circles of waves, alone, self-contained, serene.

For example, holding the shell on the outstretched palm of your hand ask -- Can you see why she might say the snail shell looks like a cat?

Hold the shell so that students see it appear flattened and ask -- does the shell look like someone drew -- "pencilled" -- a spiral on it? Does it look like an eye? Could you imagine it staring at you? Could you imagine that it is the moon?

Hold the shell again upright on your outstretched palm and ask -- can you imagine it as an island?

Wait for most of the students to see the comparison before you go on to the next phrase or sentence.

Summarize for students: Anne Lindbergh describes her shell not just with words but with imaginative comparisons of what it looks like. Did you put any comparisons on your list where you said your shell looked like something else? Have students tell you comparisons they have already made and identify comparisons in the group cluster the class made for the conch.

Record students' answers as you model again with the conch shell: To what could we compare the rough surface of this shell (a potato chip with ridges, a rock?) What else might be this same color of pink (a sunrise, a little girl's dress?) What else is shaped like this shell (a drill, a star?)

DAY 4: Give Prompt.

PROMPT: Write a meditation on your shell, connecting the shell with all the images - sights, sounds, tastes, textures, and smells - it suggests to you. Your first attempt does not have to make perfect sense, and your images do not have to be logically·connected. Let your fancy free. Try to create at least <u>six comparisons of your shell with other things</u>. You may write your result as a paragraph or as a poem. One possible pattern is presented below. You can use this pattern to start your meditation and, if you choose, you may then use the line beginnings as transitions for the sentences in a paragraph or as the beginnings of each of the lines in a poem. Add or delete anything from the lines to make them fit your ideas. Or begin a completely different poem of your own with six comparisons arranged in your own way.

PRECOMPOSING:

To guide their meditations, give students the following poetic form based loosely on the Lindbergh passage.

> As I gaze into the . . . of the shell
> First it is . . .
> And then it is like . . .
> And then it is like . . .
> And then it becomes . . .
> And now it is . . .
> And now it is . . .
> And now I am . . .

Using the conch as a model again, teacher reads the sample poem below to students, stopping after each line to relate the comparison to the shell:

> As I gaze into the pink hollow of the shell
> First it is the sunrise above dark desert mountains
> And then it is like the stretched wrinkled freckled skin of an ancient woman
> And then I look into a pink kaleidescope rimmed with purple
> And then it becomes a Hawaiian cliff smoothed by purple waves
> And now it is a Spanish castle gleaming in a hot sun
> And now it is a pagoda; I can hear the chimes tinkling in the eastern wind
> And now it is a whirling star
> And now I am a starrider.

Introduce the following chart on the board:

COMPARISONS	COMMENTS
(The shell is like:) sunrise above dark desert mountains	I like this because . . . I don't see this because . . . What I don't understand is . . .

Ask students to identify the comparisons being made.* Discuss which ones they like best and why, listing answers on the comments side. Point out that the best comparisons are unique, not just the first thing that would come to everybody's mind. Also, better comparisons use sensory words -- give colors, textures, sounds, etc. -- and specific words like Hawaiian, Spanish, and pagoda.

Now students meditate on their individual shells, filling out the frame or making a list of six or more comparisons of their own.

After students complete their meditations, discuss possible forms they might use. Show them the student models provided below. Likewise, discuss which of the student comparisons are unique, sensory, and specific.

WRITING:

Students write one or more exploratory drafts until they feel satisfied with their form. They may choose to keep the frame as it is, recopying it with their own comparisons. Or they may change the frame's wording, sequence, or form on the page in any way they wish as in the example below. Another option is to create a different poetic arrangement of their comparisons (some students like to rhyme.) Finally, they may choose to put the comparisons into a paragraph form.

GIFT FROM THE SEA

It's moonlight

     and rainbows

          a seraph's wings

   silvery satin

       rippling waters

          Saturn's rings

Everything you are, and are meant to be . . .

   I smile and caress my gift from the sea.

          Susan Starbuck

SHARING:

DAY 5

In groups of three, students share their rough drafts, each student filling out a Comparison/Comment chart as they did with the sample poem and listing each group member's comparisons and what they like about it, miss in it, etc. In addition, each group member helps the writer think of more comparisons if he has fewer than six.

*NOTE: If desired, the terms simile and metaphor could be defined and discussed here.

REVISING:

After seeing the work of others and receiving comments on their own, students change their forms or their comparisons to be more unique, sensory, or specific.

EDITING:

DAY 6

In groups of three, students check spelling and, if applicable, paragraph/sentence mechanics.

MOUNTING:

Students recopy final draft neatly in ink and mount it and their shell illustration (if they wish) on colored paper for display in the room. These are especially attractive if students cut around the writing and drawing to make an interesting layout. (Teacher may wish to put the meditations up on a blue backing to simulate the ocean and title the display "Find Yourself in the Sea.")

EVALUATION:

Give students a chance to wander and read all the meditations in the display, or have individual students go to the display to read their own or others' work to the whole class. This constitutes an informal peer evaluation and allows each student the pride of publication.

Points for completing the product may be given instead of a precise evaluation. Allow students to feel artistic success. Any scores given to the papers should not be posted since they may detract from the appearance or appreciation of the students' work.

If desired, a PRIMARY TRAIT scoring can be used by the teacher.

PRIMARY TRAIT -- Uses 6 interesting/unique comparisons
6 points possible

SECONDARY TRAITS -- Form and Correctness
Form -- neat, attractive layout
2 points
Correctness -- spelling, sentence structure if paragraph form is used
2 points

EXTENSION ACTIVITIES

Using the process of observing closely and imagining what else something might be, students create six unique comparisons to describe a person, place, or thing of their choice.

Students include a number of comparisons to enliven their next writing assignment.

Students identify and share comparisons in their assigned or free reading books.

Students receive instruction in similies and metaphors and identify these in their own work, other students' work, and in professional models of prose and poetry.

Making Connections--A Meditation on a Shell

From Gift From the Sea by Anne Morrow Lindbergh

This is a snail shell, round, full and glossy as a horse chestnut. Comfortable and compact, it sits curled up like a cat in the hollow of my hand. Milky and opaque, it has the pinkish bloom of the sky on a summer evening, ripening to the rain. On its smooth symmetrical face is pencilled with precision a perfect spiral, winding inward to the pinpoint center of the shell, the tiny dark core of the apex, the pupil of the eye. It stares at me, this mysterious single eye--and I stare back.

Now it is the moon, solitary in the sky, full and round, replete with power. Now it is the eye of a cat that brushes noiselessly through long grass at night. Now it is an island, set in ever-widening circles of waves, alone, self-contained, serene.

Prompt:

Write a meditation on your shell, connecting the shell with all the images--sights, sounds, tastes, textures, and smells--it suggests to you. Your first attempt does not have to make perfect sense, and your images do not have to be logically connected. Let your fancy free. Try to create at least six comparisons of your shell with other things. You may write your result as a paragraph or as a poem. One possible pattern is presented below. You can use this pattern to start your meditation and, if you choose, you may then use the line beginnings as transitions for the sentences in a paragraph or as the beginnings of each of the lines in a poem. Add or delete anything from the lines to make them fit your ideas. Or begin a completely different poem of your own with six comparisons arranged in your own way.

First it is . . .

And then it is like . . .

And then it is like . . .

And then it becomes . . .

And now it is . .

And now it is . . .

And now I am . . .

Sample:

As I gaze into the pink hollow of the shell
First it is the sunrise above dark desert mountains
And then it is like the stretched wrinkled freckled skin of an ancient woman
And then I look into a pink kaleidoscope rimmed with purple
And then it becomes a Hawaiian cliff smoothed by purple waves
And now it is a Spanish castle gleaming in the hot sun
And now it is a pagoda; I can hear the chimes tinkling in the eastern wind
And now I am a starrider.

Gift From the Sea

It's moonlight

      and rainbows

            a seraph's wings

   silvery satin

      rippling waters

         Saturn's rings

Everything you are, and are meant to be . . .

   I smile and caress my gift from the sea.

--Susan Starbuck

Persuasive Letters

Lesson	Predicting possible reactions and meeting them with logical arguments, students will write a letter designed to persuade a specific audience to do something.
Objectives	**Thinking Skills** Students will function at the *EVALUATION* level by *PREDICTING* and *PERSUADING*. **Writing Skills** Students will be expected to write a persuasive letter which contains a well supported argument directed toward a particular audience.

The Process

Prewriting

1. As a class, ask students to brainstorm *WHO* they have persuaded in the past, *WHAT* they have tried to persuade them to do, *HOW* they tried to persuade them, and what the *RESULTS* were on the following chart:

    Example:

Past			
What	**Who**	**How**	**Results**
take me to the movies	big brother	beg	was mad but took me anyway
let me take skating lessons	Mom	pant & whine	said, "No"
stay all night	friend	asked politely	stayed
buy me a bike	parents	cry	didn't buy it

2. Ask students to describe and explain orally their situations (*WHAT, WHO*) to the class. Discuss the *HOW* and *RESULTS* columns.

3. Ask the class if anyone has ever tried writing a letter to persuade someone. If nobody has, suggest it and explain that letter writing can be a very effective tool for persuasion because it gives you time to plan your argument.

Prompt: Choose one thing that you would like to persuade someone to do. Write a letter to persuade your chosen audience. Your letter should show that you have done the following:

•clearly stated what you want and why;
•used a tone suited to your audience;
•predicted two possible objections your audience might have:
•met those objections with logical arguments; and
•followed the standard letter format of greeting, body and closing.

Precomposing

Focusing

4. Students may work in pairs, in groups or individually. Ask students to choose one thing that they would currently like to persuade someone to do (WHO. WHAT) and enter the information in the first two columns of the chart below:

Who	What	Possible Objections of Audience	Possible Arguments of Persuader
Mom	Let me take 3 friends to Farrells for my birthday.	1. It's too expensive. 2. 3.	1. I'll help pay with my allowance. 2. 3.

Oral Persuasion

Experimenting With Tone

5. Introduce the concept of tone by presenting students with this situation:

Suppose you were certain that you had put your favorite record album in a special spot in your bedroom and it's not there. After searching your room thoroughly and feeling frustrated, you must set out to question the following people about whether they've moved. misplaced or taken your record:

•a person who cleans house
•your mom
•your kid brother or sister
•a neighborhood friend who is always "borrowing" things without asking
•What words and tone of voice would you use to inquire about the whereabouts of your record with each specific audience?
•How would your language and tone differ depending on your relationship with each person?
•Choose a word or words to describe a tone you might use with each audience (i.e., respectful, humorous, accusing, sarcastic, angry, etc.)

Explain to students that tone is something you use in writing as well as in speaking. The same accusing tone one might verbally use when asking a neighborhood friend,

who is always "borrowing" without asking, if they have taken a favorite record can also be conveyed in writing through precise word choice.

Oral Persuasion and Predicting Objections of Audience

6. Ask students to brainstorm the characteristics of their chosen audience which might help them choose the appropriate tone. Enter the list on the chart as shown.

Who	What	Possible Objections of Audience	Possible Arguments of Persuader
Mom	Let me take 3 friends to Farrells for my birthday.	1. 2.	1. 2.
Characteristics		3.	3.

7. Ask two students to role play the situation they chose during the Focusing Stage (see Step 4) in front of class. Ask the students to identify which person is the AUDIENCE and which person is the PERSUADER. Before the role play begins, brainstorm characteristics of the AUDIENCE which might influence their reactions. (For example, if a student wanted to persuade his mom to let him buy a boogie board, it would help the partner role playing his mom to anticipate her objections if he knew that she had earlier refused to let her son buy a skateboard because she was afraid he might fall and hurt himself.) PERSUADERS can experiment with different tones in attempting to persuade the chosen AUDIENCE. Discuss which tones the PERSUADER used that were most effective and why.

8. Students should enter the POSSIBLE REACTION OF AUDIENCE and POSSIBLE ARGUMENTS OF PERSUADER on the chart:

Who	What	Possible Objections of Audience	Possible Arguments of Persuader
Mom	Let me take 3 friends to Farrells for my birthday	1. It's too expensive. 2.	1. I'll help pay with my allowance. 2.
Characteristics •likes bargains •cheerful •hates driving •worries •doesn't listen •always says, "I want you to be happy" •always says, "Get to the point"		3.	3.

Transition From Oral Persuasion To Written Persuasion

9. Help students make the transition from oral role play to written expression by conducting the following activity:

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•On a lined sheet of paper, the *PERSUADER* should ask the *AUDIENCE* to do what he/she is trying to persuade him/her to do.

E x a m p l e : Mom, will you let me take three friends to Farrells for my birthday?

•The *AUDIENCE* should read the question silently, then write a response according to his/her first possible reaction and return it to the *PERSUADER*.
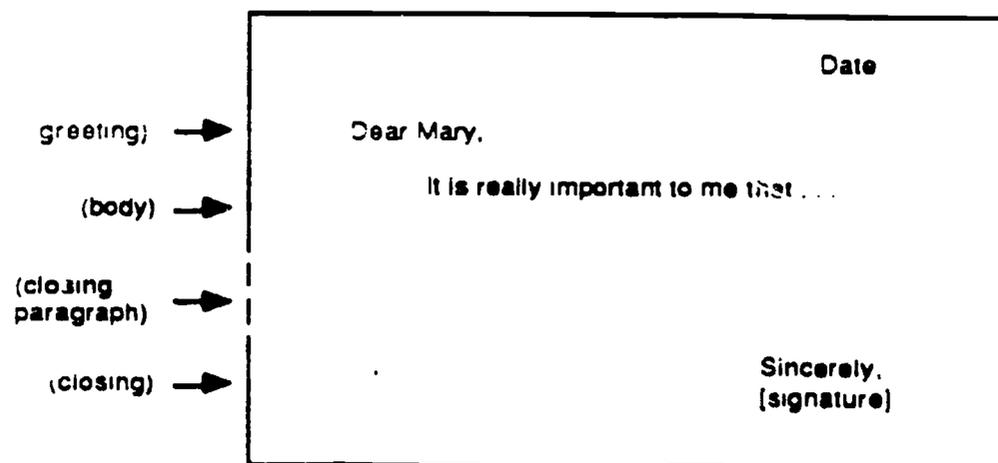
E x a m p l e : No. Farrells is too expensive.

•The paper is to be passed back and forth in this manner until the *AUDIENCE* is convinced or the *PERSUADER* gives up.
•The *PERSUADER* should then read over the dialogue and enter new *POSSIBLE REACTIONS* and *POSSIBLE ARGUMENTS* on the chart.
•Now, have the students switch roles and do the exercise again so that both students' charts are complete.
•Enter more *POSSIBLE REACTIONS* and *POSSIBLE ARGUMENTS* on the chart.
•Ask students to put a star next to two objections they think their audience is sure to make.

Who	What	Possible Objections of Audience	Possible Arguments of Persuader
Mom Characteristics	Let me take 3 friends to Farrells for my birthday.	1. "It's too expensive" * 2. "I don't know where Farrells is." * 3. "I don't have time. "	1. "I'll help pay with my allowance." 2. "There is a Farrells only 2 blocks from school." 3. "You don't have to come."

10. Review the prompt and proper letter format with the class. Discuss possible opening statements they could use on their letters. It is helpful if you list them on the board.

Example of Proper Letter Format

greeting) →   Dear Mary,

(body) →   It is really important to me that . . .

(closing paragraph) →

(closing) →

Date

Sincerely,
[signature]

11. Read a model to the class emphasizing the structure followed. Students may use their own structure but should include the following:

•What is wanted

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- Reasons why
- Two possible objections
- Reasons to overcome the objections
- Closing summary

[date]

Dear Mom,

This year I would like to have my birthday party at Farrells with three of my best friends. I've always wanted to go to Farrells because they sing "Happy Birthday" and play the big drum if you tell them it's your birthday.

I know that you probably will think that it will be too expensive but it really won't be because I will pay for my friends' ice cream with my allowance. You won't need to give me any extra money because my ice cream will be free just because it's my birthday. That's why everyone likes to go to Farrells on their birthday.

You might not know where there is a Farrells and be worried about driving with kids in the car. Guess what? There is a Farrells just two blocks from the school. We could walk and meet you there.

I hope you will think about my idea and say "yes." The only thing I really want for my birthday is to have a party at Farrells. Please let me know what you decide.

Love,

Molly

Discuss reasons why students might follow a different structure than Molly did. Why might it be a bad idea to start out with what is wanted and why? When might it be more useful at the end of the letter?

Could you combine two objections and arguments into one paragraph? When? How?

Could Molly's closing paragraph be used to begin the letter? What changes would have to be made?

Writing

Students write their letter referring to their lists of POSSIBLE REACTIONS OF AUDIENCE and POSSIBLE ARGUMENTS OF PERSUADER.

Sharing

Students share letters and help each other decide whether or not the letter will persuade the intended audience. Partners should underline what is wanted in blue and the reasons why in yellow. They should underline the objections of the audience in red and arguments to overcome objections in green. Partners should also discuss whether or not the tone is appropriate for the audience. Optional: Partners may indicate a preliminary primary trait score. (See EVALUATION section of lesson.)

Revising

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Based on the feedback received, students should revise letters to make them more persuasive. They should consider the following questions:

•Is what I want clearly stated?
•Have I stated the reasons why I want it?
•Do the words I chose create the right tone for my audience?
•Did I include two possible objections?
•Are my arguments against those objections persuasive?
•Is my closing paragraph effective?

Editing

Students may edit their own letters or exchange them with a friend. The Secondary Trait Scoring Guide should be used as a reference. (See EVALUATION section below.)

Evaluation

Primary Trait Scoring Guide

3   This letter clearly states what is wanted and why, anticipates objections and meets them with logical arguments. It probably would persuade your audience because the arguments are presented in a suitable tone.

2   Although the tone is appropriate and this letter presents persuasive arguments, it does not anticipate the possible reactions of your audience, or it anticipates reactions, but does not meet the objections with logical arguments. It might persuade them but then again it might not.

1   This letter would probably not persuade your audience since it is not presented in a tone suited to your audience and/or does not anticipate possible reactions or meet them with specific arguments.

Secondary Trait Scoring Guide

2   This letter follows proper letter format, is neat and easy to read and has no errors in spelling, mechanics, or usage. A letter like this is a pleasure to receive. Your audience will be impressed with your writing skills.

1   This letter follows most of proper letter format but is not as neat and easy to read. It has a few errors in spelling, mechanics, or usage. If your primary trait score is high, your audience still might be persuaded.

0   This letter is not neat or easy to read. It has many errors in spelling, mechanics, or usage. Even if your primary trait score is high, your audience probably would not do what you want them to since they might not be able to read it or even want to read it.

Extension Activities

Application

Deliver the final letter to the audience it was intended for. Ask your audience to write back and tell you if you persuaded them with your arguments.

Application _____

Prompt: After reading Mark Twain's novel, *Tom Sawyer*, explain how Tom persuaded his friends to whitewash the fence for him. How would you characterize the tone he used with his friends? Why do you think his approach to persuasion was effective?

Evaluation _____

Prompt: Choose a real audience at home or at school and try to convince them of something by writing a letter or composing a speech. You might try convincing:

•the teacher to give the class an extra recess.
•the principal to allow the class to raise money for a special field trip.
•the custodian to take you as a morning helper.
•other classes to write letters and send art to homebound children or a children's hospital.
•a community club to sponsor an activity at your school.
•students at your school to write letters to Congressmen about endangered species legislation.
•students at your school to write letters to Congressmen stating their position on the nuclear arms race.

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CO-AUTHORS · MINDY MOFFATT and ERLINE KREBS

Writing Domain: Analytical/Expository

Thinking Level: Analysis
Grade Level: K · 12

When Clay Sings

Integrating Art, Writing, and History Based on Byrd Baylor's Book

LESSON: After reading Byrd Baylor's <u>When Clay Sings</u>, students will make and decorate clay pottery based on what is important to their lives. Then students will write an analysis of the decorations told from the pot's point of view which will provide insight into the life of the student who fashioned the pot.

OBJECTIVES: <u>Thinking Skills</u>

Students will:
- RECALL information about previous cultures and the lives of other people through ancient clay pottery after reading <u>When Clay Sings</u>.
- LABEL symbols which represent important aspects of their own lives.
- DESCRIBE what is important in their lives.
- IMITATE ancient pottery by decorating their own clay pot.
- DRAW CONCLUSIONS about the lives of the people who made clay pottery.
- DESIGN their own clay pot or container.
- PRIORITIZE meaningful aspects of their lives as they fashion and decorate their clay object.

<u>Writing Skills</u>

Students will:
- WRITE an analytical/expository essay utilizing many of the traits of other domains, particularly sensory/descriptive techniques as they describe a clay object and make inferences about the person who made the object.
- WRITE the essay from the point of view of the clay object.

THE PROCESS

This lesson requires several days depending upon the sophistication of clay work (firing and glazing pots demands more time than using modeling clay or Play-Doh). After building background information from reading *When Clay Sings*, students compare and contrast modern containers with the clay pots described in the book. While students begin to work on making their own pots, vocabulary is developed as they look at their own lives to prioritize what is important to them. Once students have listed their priorities, they design symbols for decorating their pots, and in the process they communicate about their lives through art. Finally students write as if they were the pot describing itself and providing insight into the life of the person who made it.

Much depth and richness can be added to this lesson if the teacher has access to pottery which could be displayed in the class.

PREWRITING:

1. Read aloud *When Clay Sings* by Bird Baylor (it is suggested that Native American music such as <u>Changes: Native American Flute Music</u> by R. Carlos Nakai, be played softly in the background during the reading and throughout the lesson).

2. As a whole group, cluster from the story about the clay pots which were described. (Use butcher paper for the cluster and marking pens in earth colors used in the illustrations in the book such as brown, beige, black and white. Putting the cluster on butcher paper allows the cluster to remain on display as students add to it during the course of the lesson.)

   Emphasize the following:

   ° Who made the pots
   ° What the pots were used for and the various shapes which dictated the purpose
   ° The colors of the decorations on ancient pots
   ° The symbols from nature which decorated the pots
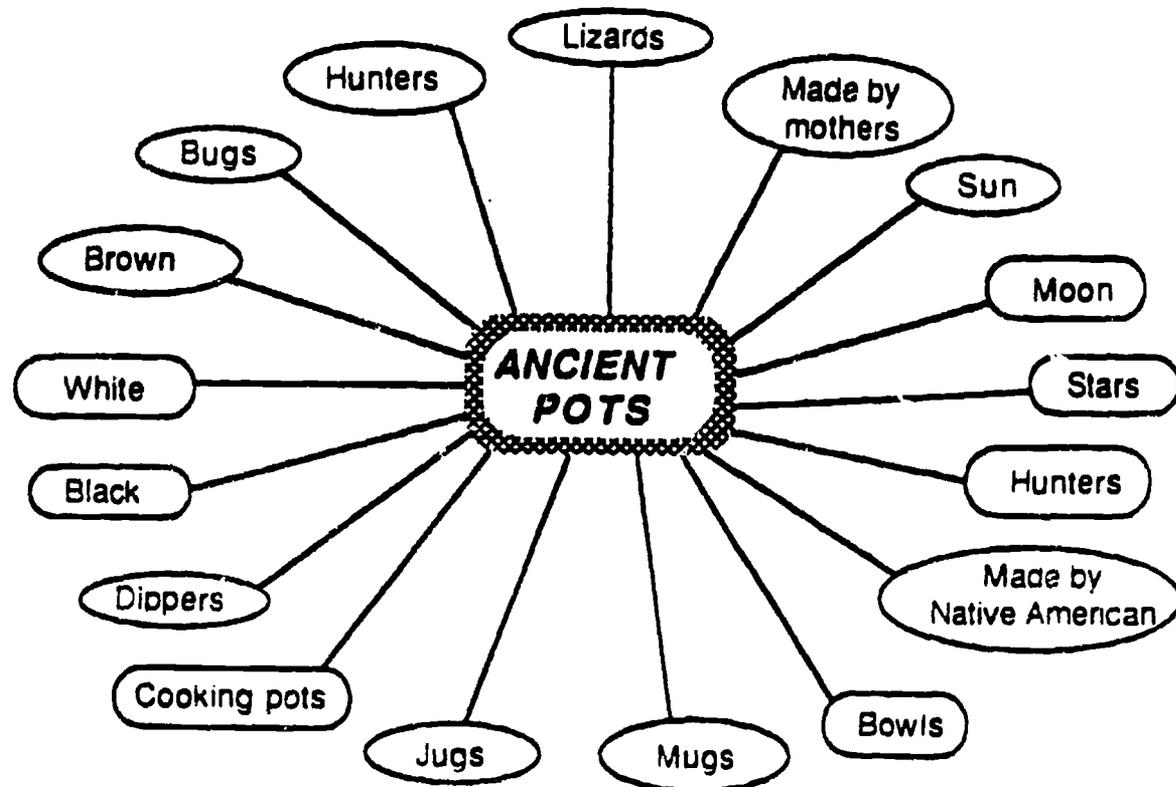
3. Allow students to move around the classroom looking for objects that are containers in order for students to gain a feel for the vast array of containers which surround them.

4. List their responses on chart paper for vocabulary development while discussing the variety of shapes of the containers.

5. Provide students with the opportunity to bring to class and share objects from their own lives which are used to hold other things. Example: cereal, bowls, coin banks, pencil boxes, shoe boxes, eyeglass cases, purses, wallets, cups, backpacks or book bags, "Baggies," aluminum cans, lockets, pockets, plant hangers and pots, egg cartons, etc.

6. Give each students a lump of clay to "play" with, as they are pushing, pulling, rolling, and kneading the clay, add to the cluster on the ancient pots by relating students'

thoughts about modern containers. Use marking pens in colors different from original cluster items to delineate the modern additions on the cluster.
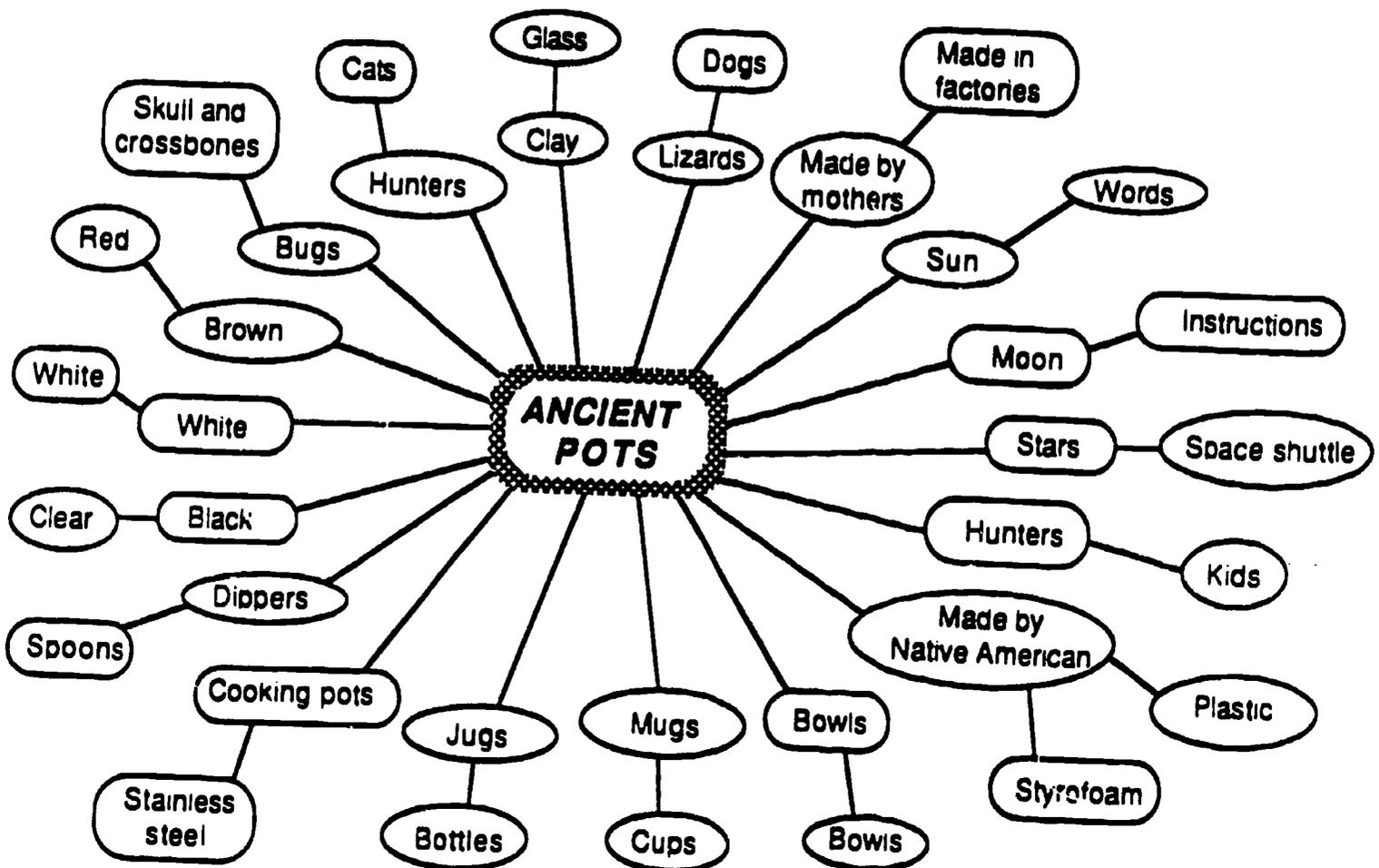

7. When the majority of students have played with the clay long enough to where they begin to shape pots, stop and talk about ancient pots and uses for the different shapes. For example: pots with narrow openings probably held water, pots shaped like bowls probably held cereals and grains, deep pots with lids might have been for storage, low flat pots might have been used for mixing, etc. Compare these details with modern containers' shapes and uses. Continue adding students' insights on the cluster.

8. Emphasize to students that their pot must have a practical use in their lives. Just as ancient pots all had specific purposes.

9. Have students make their own pots. Allow clay to dry while implementing the next steps. Fire pots if you choose.

10. Discuss the designs on ancient pottery with students (based on the original cluster items in brown, beige, white, and black). All of the designs were about the REAL lives of REAL people who made the pots. the designs related what was important to the potter. Refer back to the story.

11. As a whole group on another sheet of butcher paper, make a Venn diagram comparing and contrasting the world and lives of ancient people and the world and lives of the students.

    a. Elicit responses to fill in the ancient circle on the left side of the diagram based on

questions such as:

- ° What colors were used?
- ° What were the containers used for? How do we know this?
- ° Where did the ancient people live? What hints do these containers provide about where the people lived?
- ° What was important to the people's lives? How do we know this?
- ° Do these designs show what people did?
- ° What did the people see in their lives which was painted on the pots?

EXAMPLE:

ANCIENT

Brown
Black
White
Food
Mesas
Cliffs
Hunting
Bears
Cooking
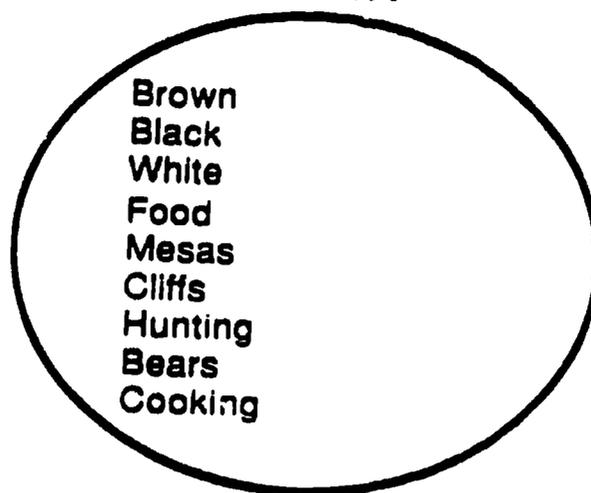
b. Next have students respond about their own modern lives and fill in the right side of the diagram by using questions such as:

- ° What colors are modern containers?
- ° What are the containers used for? How do we know this?
- ° Do these containers hint about where people live?
- ° How are the containers decorated?
- ° Do these designs show what people do?
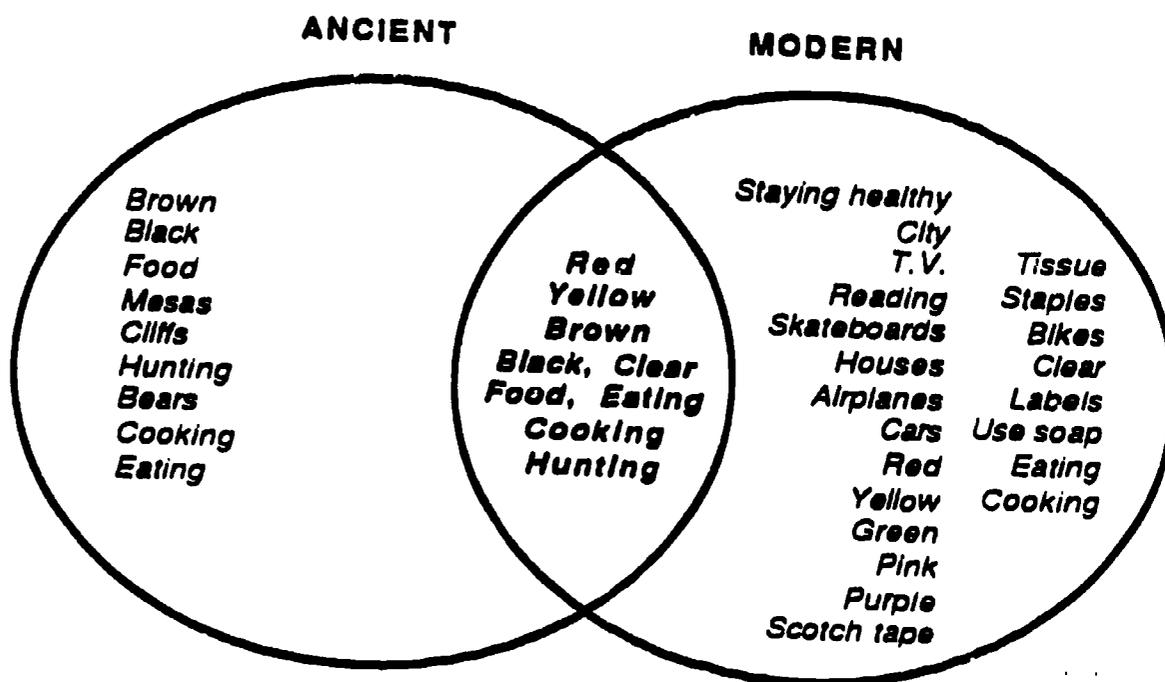- ° What is important about the lives of people who use these containers?

EXAMPLE:

MODERN

Labels   Red
Use soap   Yellow
Airplanes   Green
Houses   Pink
Cars   Purple
Eating   Tissue
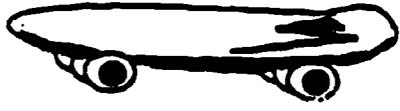Staying healthy Stamps
Skateboards
               Bikes
Scotch tape

c. Finally have students analyze the two circles and fill in the center overlap section with items which represent both modern and ancient worlds.

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Example:

ANCIENT   MODERN

Brown
Black
Food
Mesas
Cliffs
Hunting
Bears
Cooking
Eating

Red
Yellow
Brown
Black, Clear
Food, Eating
Cooking
Hunting

Staying healthy
City
T.V.   Tissue
Reading   Staples
Skateboards   Bikes
Houses   Clear
Airplanes   Labels
Cars   Use soap
Red   Eating
Yellow   Cooking
Green
Pink
Purple
Scotch tape

12. Once the group diagram is complete, have students make up a personal two-column chart about their lives. (The teacher models a personal chart for his/her life.) Attend to the following questions as you model how to fill in the chart:

   ° What do you do that is important to you?
   ° What do you see around you that is an important part of your life?
   ° What people are important to you?
   ° What is your favorite food? pastime?

13. Then draw pictures in the right hand column which symbolizes the answers on the left.

What is important to me	SYMBOL
Playing baseball	
Going to Disneyland	
Skateboarding	
Eating at McDonald's	

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14. Once students' own charts are complete, have students choose three symbols which represent what is most important in their lives, right now, which they will eventually paint on or etch into their dried clay pots. Point out the designs on ancient pots to note repetition in symbols.

15. Have students draw a picture of their clay object by outlining its shape. Using symbolic pictures and words, have students draw or map these designs on their drawing to enable them to see that a story can be told about their lives by the designs they use. Encourage the use of sensory descriptive words mapped on the drawing to build vocabulary as they describe the feelings, thoughts, places, etc. that are triggered while they work on their design. What does the clay "sing" about their own lives?
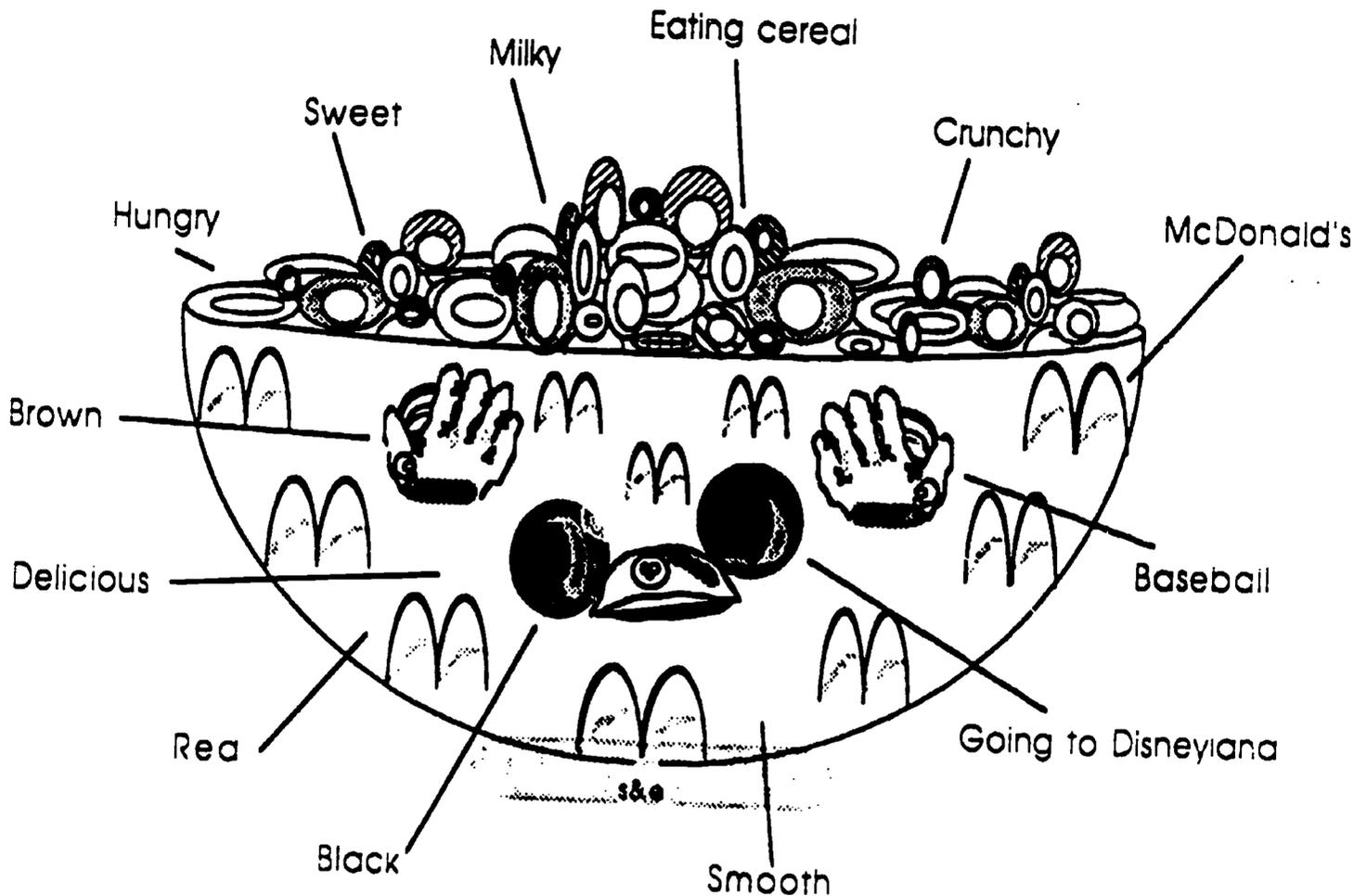
16. Now using toothpicks, tongue depressors. or paints and glazes, students decorate their own pots using the mapped drawing.

PROMPT:

If this clay object were to sing about itself. what would it say? You will write about the pot and the life of the person who made it as if you are the pot.

Imagine that you are the pot. Describe yourself. the colors. your shape, the designs. etc. What are you. as the pot. used for? Tell about the person who made you based on the 3 designs that show what is important to his/her life right now. What do you, as a piece of pottery, communicate to others about the maker's life?

Your writing should have correct spelling, capital letters. and end punctuation.

PRECOMPOSING:

From the drawing of the pot and the words which were mapped on it, construct construct language experience sentences which tell about the object and the maker o provide students with a frame which they will copy as they fill it in.

Frame example:

I am a _____ (color) pot. I am shaped like _____ . I am used to hold _____. The designs on me are _____, _____, and _____. What I like best about me is _____.

The person who made me is _____ . She/he likes ____ _____ because of the _____ design. _____ is very important to the person who made me. I know that because of the _____ design. Finally, the _____ design tells that the person who made me likes to _____. Some day someone may find me and they will know that the person who made me is special because _____.

WRITING:

Students will write their papers based on their analyses of the pots from the pot's point of view. Elicit key words from the class cluster and students' own drawings to develop vocabulary.

SHARING:

Assign student partners. Choose a student partner for yourself. Model how to analyze a pot by holding one up and imagining what the pot would say about itself and the maker. Then look at the writing and compare it with what the pot "sings." (The teacher must write. along with the students. in order to have a pot and piece of writing to share during this stage.)

REVISION:

1. Students revise their writing based on the feedback from sharing so that the writing directly relates to the pot and its designs.

2. Next hand out the Revision and Evaluation sheet for students to complete. The editing section of the sheet will be filled out later in the lesson.)

Name _____

┌───┐
│   REVISION AND EVALUATION SHEET   │
└───┘

REVISION	AUTHOR	TEACHER
Description of object		
Colors		
Shape		
Designs		
Use of object		
Telling about the maker		
Design 1		
Design 2		
Design 3		
This writing really sings!		

EDITING:

I am proud I put a capital letter on this word _____ because

_____ (rule).

I need to remember to capitalize _____

I am proud that I spelled this word right! _____

A word I need to work on is _____

I am proud that I put a period at the end of this sentence ___ ___ . _____

_____

A sentence that I need to work on is _____

_____

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Editing is determined by the teacher based on no more than 3 skills on which the students are to focus. In a whole group, demonstrate how to re-read the piece for accuracy of capital letters. Students suggest the rules they have learned for correct use of capital letters. and then look over their own papers to see if they have correctly applied each rule.

For instance. one rule is always start a sentence with a capital letter. Students check their papers for this application. Another rule is that names should always start with capital letters. Students then check for this rule looking for any name they have written and making sure that it starts with a capital letter. For reinforcement of the rule, students refer to the editing section of the Revision and Evaluation Sheet by writing examples of the rules they knew (from their papers) and the rules they needed to correct.

For spelling, use the butcher paper clusters and charts. Encourage students to point out difficult words to spell and have them check their papers for the correct spelling if they used that word. Finally students write difficult words on the editing section of the Revision and Evaluation Sheet for reinforcement.

Continue this process for end punctuation (or any other mechanical skill that is emphasized in the prompt).

EVALUATION:

The teacher fills out his/her column on the re sion and editing check list.

Recommended Readings

Arnold, David. "Pueblo Pottery," National Geographic, Vol 162, #5, November 1982, pp. 593-605.

Babcock, B & Monthan, G. and D. The Pueblo Storyteller: Development of a Figurative Ceramic Tradition. Tuscon: University of Arizona Press, 1986.

Baylor, Byrd and Peter Parnall. Desert Voices. New York: Charles Scribner's Sons, 1981.

Baylor, Byrd. Everybody Needs a Rock. New York: Macmillan Publishing Co. (Aladdin Books), 1974. (Illustrated by Peter Parnall)

Baylor, Byrd. Guess Who My Favorite Person Is. New York: Charles Scribner's Sons, 1977. (Illustrated by Robert Andrew Parker)

Baylor, Byrd. Hawk, I'm Your Brother. New York: Macmillan Publishing Co., 1976. (Illustrated by Peter Parnall)

Baylor, Byrd and Peter Parnall. If You Are A Hunter of Fossils. New York: Charles Scribner's Sons, 1980.

Baylor, Byrd. I'm in Charge of Celebrations. New York: Charles Scribner's Sons, 1986. (Pictures by Peter Parnall)

Baylor, Byrd. Moon Song. New York: Charles Scribner's Sons, 1982. (Illustrated by Ronald Himler)

Baylor, Byrd. Sometimes I Dance Mountains. New York: Charles Scribner's Sons, 1973. (Photographs by Bill Sears. Drawings by Ken Longtemps)

Baylor, Byrd. The Desert is Theirs. New York: Charles Scribner's Sons, 1975. (Illustrated by Peter Parnall)

Baylor, Byrd and Peter Parnall. The Other Way To Listen. New York: Charles Scribner's Sons, 1978.

Baylor, Byrd. The Way To Start A Day. New York: Charles Scribner's Sons, 1978. (Illustrated by Peter Parnall)

Baylor, Byrd. When Clay Sings. New York: Charles Scribner's Sons, 1972. (Illustrated by Tom Bahti)

Baylor, Byrd. Your Own Best Secret Place. New York: Charles Scribner's Sons, 1979. (with Peter Parnall)

George, Chief Dan. My Heart Soars. Canada: Hancock House Publishers Ltd., 1974. (Drawings by Helmut Hirnschall)

Weitzman, David. My Backyard History Book. Boston: Little, Brown Company, 1975.

....enjoy the adventure....

Source for Native American music: *The Indian Shop* at Hobby City on Beach Blvd. in Buena Park.

Navajo Two-Step Dance--Love Songs by Four Corner Singers

Changes: Native American Flute Music by R. Carlos Nakai

"Thank You M'am":

Speculating About the Ending of a Story

Lesson   Students will speculate about an outcome and then compose an ending for the story "Thank You M'am" by Langston Hughes.

Objectives   Thinking Skills
                    Students will function at the SYNTHESIS level by SPECULATING about an ending of a story based upon facts from the story, FORMULATING that speculation as an ending, and COMPOSING that ending.

                    Writing Skills
                    Based on their understanding of the story, students will employ the composing and crafting skills of narration, showing, not telling description, and dialogue writing to complete the story, "Thank You M'am."

The Process

Prior to this lesson, students will have had practice in Rebekah Caplan's technique of snowing, not telling.*

Prewriting

: Clustering: Ask students to create a cluster of specific incidents from their lives which come to mind around the phrase, "I knew it was wrong, but I did it anyway " Assure them that their clusters will remain confidential. A sample cluster might look like this:

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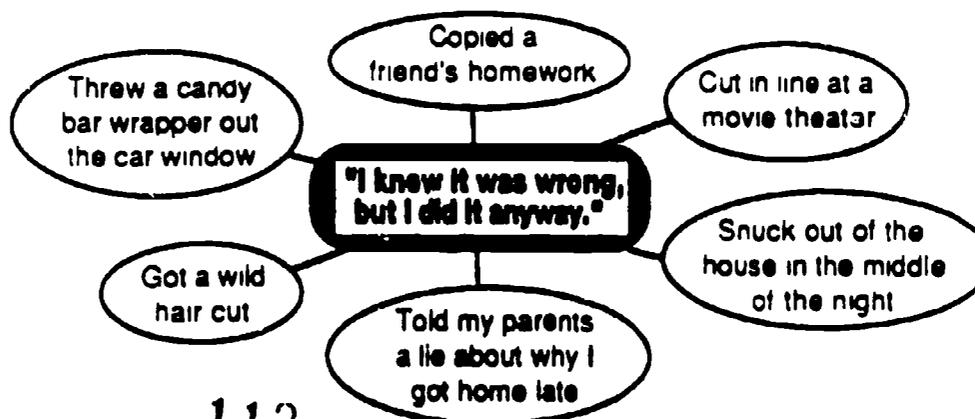
2. C h a r t i n g : After students have completed their clusters. ask them to choose three of the incidents and to record them on the chart below   As they record, ask them to respond to the following questions for each incident:

•What did you do even though you knew it was wrong?
•Why did you do it?
•How did you feel about it afterward?
•Did your feelings about what you did cause you to take any actions? If so. what were they?

A sample chart might look like this:

What	Why	Feelings	Actions
Stole something from the store.	To see how it felt.	Felt guilty. Wished I hadn't done it.	Took it back and left it on the counter when no one was looking.
Cut off my pigtail.	Thought it would be funny.	Was embarrassed later.	Tried to tape it back on with scotch tape.
Short-sheeted my friend's bed.	For a joke.	Thought it would serve him right for playing practical jokes on me.	Apologized. Then put a lizard in his bed the next day.
Copied my friend's homework and turned it in as mine.	Didn't get mine done.	First relief, then had second thoughts.	Resolved to do my own homework next time

3. S h a r i n g : Then. divide students into groups of four and provide each group with a blank WHAT/WHY/FEELINGS/ACTIONS chart. Each of the four students should select one of his/her three incidents that he/she would feel comfortable sharing with his/her peers and form a composite chart comprised of one incident from each student.

4. S h o w i n g , n o t t e l l i n g : Collect these composite charts and distribute them so that each group has another group's chart. Each group member should now select one of the four incidents from the chart the group received to dramatize through showing, not telling. (Note: More than one student can select the same incident.) The goal of this exercise is to empathize with another person's experience and to vividly describe what that person did, why he/she did it, how he/she felt about it afterwards and what actions he/she took as a result. Since these incidents come from classmates but the specific students are not identified, students will have to speculate to create a fictional account of what they believe might have happened.

Showing, not telling paragraphs should illustrate the telling sentence, "He (or she) knew it was wrong, but he did it anyway." A sample student model is provided below

11.4   The Clock

This never would have happened if our math teacher didn't get sick. Eric and I went to our math class and for the first time we arrived there before the bell sounded. When we arrived, I noticed that we had a sub, but I don't think Eric did, because he

was too busy talking to some blonde. But when Eric did notice that we had a sub, he got a gleam in his eyes and a funny grin on his face. I knew he was up to something, but, at the time, I wasn't sure what. I casually walked over to my desk, keeping my eye on Eric. I noticed Eric was still standing at the door as if he were thinking, but that would be impossible because Eric never thinks. As I kept watching Eric through the corner of my eye, I saw that he had come out of his trance and back to the real world. Eric then ran over to me so fast I thought a dog was chasing him.

"What is it this time, Eric?" I asked.

"Why don't we play a trick on the sub?" he said, with that same devilish gleam in his eye.

What Eric wanted to do was, near the end of the period when the sub wasn't looking, go over to the clock and set it forward so that we could get out early. Eric told me that all I had to do was go over to the sub and distract him in anyway possible so Eric could do the dirty work. The sub was teaching the class but, of course, I wasn't paying attention, because I was too busy worrying about the clock. After the sub was done with his lecture, he went and sat down at his little desk with a picture of George Washington and started to read *Time Magazine*. Then, Eric stood up and started coughing. I figured that that was the signal so I took my math book up to the teacher. While I was walking to the teacher I saw Eric start to go over to the clock. I told the teacher, "I don't understand problem number 7." The sub started explaining it to me but, of course, again I wasn't listening. I was too busy watching Eric carry the desk. with all the colorful pieces of bubblegum stuck to the bottom, over to the clock. He stood up on the chair, slowly reached his pudgy hand up to the knob of the clock and turned the big hand of the clock ten minutes ahead. Then, he slowly stepped down and put the desk back where it was. The sub finished explaining the problem and then asked me if I understood. I said, "What, oh yah." Then I went and sat down.

The sub went back to reading his magazine and then looked up at the clock. He noticed that it was time for us to go home, so he said, "O.K. see you guys later." Everyone was laughing as they left. As Eric and I were leaving, I told him, "You shouldn't have done that."

Eric said, "I knew it was wrong, but I had to do it anyway. You know I can't resist a good practical joke."

"Well, next time don't count on me to be an accessory to the crime," I said.

"Oh, there won't be a next time. I'll be nice and give the next substitute we have a break."

But I could tell from that devilish gleam in his eye that the temptation would be too great. Although he knew it was wrong, he just might do it again.

5. R e a d i n g : The preceding activities are designed to set the stage for the introduction of Langston Hughes' short story, "Thank You M'am" and to help students to identify with the main character. Read the following portion of "Thank you M'am" aloud. Assign parts in the story so that it reads like a play.

Thank You M'am

She was a large woman with a large purse. The purse had everything in it but hammer and nails. It had a long strap and she carried it slung across her shoulder. It was about eleven o'clock at night. She was walking alone. A boy ran up behind her and tried to snatch her purse. The strap broke with the single tug the boy gave it from behind. But the boy's weight, and the weight of the purse combined, caused him to lose his balance. Instead of taking off fullblast as he had hoped, the boy fell on his back on the sidewalk. His legs flew up. The large woman simply turned around. She kicked him square in his blue jeaned sitter. Then she reached down and picked the boy up by his shirt front. She shook him until his teeth rattled. 115

After that the woman said, "Pick up my pocketbook, boy, and give it here."

She still held him. But she bent down enough to permit him to stoop and pick up her purse. Then she asked, "Now ain't you ashamed of yourself?"

Firmly gripped by his shirt front, the boy said, "Yes'm."

The woman said, "What did you want to do it for?"

The boy said, "I didn't aim to."

She said, "You a lie!"

By that time, two or three people passed. They stopped, turned to look. Some stood watching.

"If I turn you loose, will you run?" asked the woman.

"Yes'm," said the boy.

"Then I won't turn you loose," said the woman. She did not let him go.

"Lady, I'm sorry," whispered the boy.

"Uh-hum! Your face is dirty. I got a great mind to wash your face for you. Ain't you got nobody home to tell you to wash your face?"

"No'm," said the boy.

"Then it will get washed this evening," said the large woman. She started up the street, dragging the frightened boy behind her.

He looked as if he were fourteen or fifteen. He was thin. He wore tennis shoes and blue jeans.

The woman said, "You ought to be my son. I would teach you right from wrong. Least I can do right now is wash your face. Are you hungry?"

"No'm," said the boy. "I just want you to turn me loose."

"Was I bothering you when I turned that corner? asked the woman.

"No'm."

"But you put yourself in contact with me," said the woman. "If you think that contact is not going to last awhile, you got another thought coming. When I get through with you sir, you are going to remember Mrs. Luella Bates Washington Jones."

Sweat popped out on the boy's face. He began to struggle. Mrs. Jones stopped. She jerked him around in front of her and held him tight. She continued to drag him up the street. When she got to her door, she dragged the boy inside and down a hall. She led him into a large room at the back of the house. She switched on the light and left the door open. The boy could hear other people laughing and talking in the large house. Some of their doors were open, too. So he knew he and the woman were not alone. The woman still had him by the neck as they stood in the middle of her room.

She said, "What is your name?"

"Roger," answered the boy.

"Then, Roger, you get to that sink and wash your face," said the woman. Then she turned him loose--at last. Roger looked at the door--looked at the woman--looked at the door--and went to the sink.

"Let the water run until it gets warm," she said. "Here's a clean towel."

"You gonna take me to jail? asked the boy, bending over the sink.

"Not with that face, I would not take you nowhere," said the woman. "Here I am trying to get home to cook me a bite to eat and you snatch my pocketbook! Maybe you ain't been to your supper either, late as it be. Have you?"

"There's nobody home at my house," said the boy.

"Then we'll eat," said the woman. "I believe you're hungry--or been hungry--to try to snatch my pocketbook."

"I wanted a pair of blue suede shoes," said the boy.

"Well, you didn't have to snatch my pocketbook to get some suede shoes," said Mrs Luella Bates Washington jones. "You could of asked me."

"M'am?"

The water dripping from his face, the boy looked at her. There was a long pause. A very long pause. He had dried his face. And not knowing what else to do, dried it

again. Then, the boy turned around, wondering what next. The door was open

Langston Hughes
Anthologized in *Spotlight on
Literature: Collection 4* (New
York: Random House, 1980)

6. S h o w i n g , n o t t e l l i n g : Give students the telling sentence. "He knew it was wrong, but he did it anyway." Ask them, once again, to practice writing a showing description to bring this sentence to life. But, this time, the "he" they should write about is Roger in Langston Hughes' story. In order to ensure that students don't simply summarize what they have just read, ask them to use quotes from the text and to add showing details of their own to dramatize the statement.

A sample showing, not telling description might look like this:

> Long after most boys would be in bed--11 o'clock to be exact--Roger was out on the street looking for a likely target for a purse snatching. But he was no match for the "large woman with a large purse" that he singled out. Just one tug from her and he fell head over heels in the street. She grabbed him by the shirt front, kicking and struggling, and "shook him until his teeth rattled." *Oh boy, I've really gotten myself into it this time*, he thought to himself. People were already beginning to stare at him and to shake their heads. "Sweat popped out on his face." He was so flustered that he couldn't think clearly enough to come up with a good excuse to talk his way out of the mess he was in. He tried suggesting that he "didn't aim to" steal her purse but she didn't buy it. So his next step was to apologize. "I'm sorry," he whispered. But no dice. So, after she refused to turn him loose, he began to struggle. However, struggling only caused this Mrs. Luella Bates Wasington Jones to tighten her grasp. He knew it was wrong, but he did it anyway. And now he was beginning to regret wanting those blue suede s.:oes. He wondered what would happen next.

Prompt: Compose an ending for the Langston Hughes' short story "Thank You M'am" following the lines "The door was open . . ." Your ending should:

•reflect both a close reading of the story and your ability to make inferences about:
   •what each character does:
   •why Roger and Mrs. Jones do what they do:
   •how he/she is feeling about what has happened;
   •what actions each might take as a result.

•logically weave together the actual story and your ending for the story;
•rely on showing, not telling as a means of vividly conveying information;
•demonstrate an understanding of narrative structure;
•use dialogue as a means of revealing character development;
•display your understanding of the conventions of written English (spelling, punctuation, grammar)--especially those dealing with proper dialogue form.

Precomposing

1. R e r e a d i n g : Ask students to silently reread the portion of "Thank You M'am" which the class previously read aloud.

2. Q u i c k - w r i t i n g : Then, they should speculate about how the story will end and compose an ending, that begins at the line "The door was open . . ." This should be a quick-write (5 minutes) in which each student narrates as rapidly as possible the ending option he or she thinks will be most appropriate for the story. When completed, these quick-writes should be put aside and referred to later.

3. C h a r a c t e r   A n a l y s i s : Ask students to go around the class counting off 1, 2, 1, 2, 1, 2, etc. All the students with the number 1 will analyze the character of Roger Those with the number 2 will focus on Mrs. Jones. Pass out three differently-colored markers to each student.

Roger
Using the markers, students with the number 1 should silently re-read the story, focusing on Roger. Each time they come to a direct quotation by Roger, they should underline it in one color. Each time they come to something Roger does, they should underline that in a second color. Each time they find something told about Roger by the author or another character, they should underline it in the third color.

Then, they should use this information to fill out the Character Analysis Chart for Roger:

What Roger Says	What Roger's Comments Tell The Reader	What Roger Does	What Roger's Actions Tell The Reader	What Others Say About Roger	What These Statements Tell The Reader About Roger
Example: "I didn't aim to."	Roger did aim to steal her pocket-book. He is either really ashamed of what he did or he is trying to talk his way out of what he did. Maybe both things are true.	Example: Struggles to get away from Mrs. Jones.	Roger is nervous about what Mrs. Jones is going to do with him. His impulse is to escape from her clutches.	Example: "Ain't you got nobody at home to wash your face?"	Roger's face is dirty and he's also very thin. There's probably no one at home to take care of him.

After the students analyzing Roger have completed their individual charts, put them into groups of 3 or 4 to discuss the following questions.

•What did Roger do?
•Why did he do what he did?
•How did he feel about it afterward?
•Based upon his feelings in the remainder of the story, what kind of action do you think he will take ?

Mrs. Jones
While the students assigned to study Roger are completing their task, those who counted off as number 2 should be completing the same process with Mrs. Jones.

Using three different colors of markers, students assigned to study Mrs. Jones should silently re-read the story, focusing on Mrs. Jones. Each time they come to a direct quotation by Mrs. Jones, they should underline it in one color. Each time they come to something Mrs. Jones does, they should underline that in a second color. Each time they find something told about Mrs. Jones by the author or another character. they should underline it in the third color

Then, they should use this information to fill out the Character Analysis Chart for Mrs. Jones:

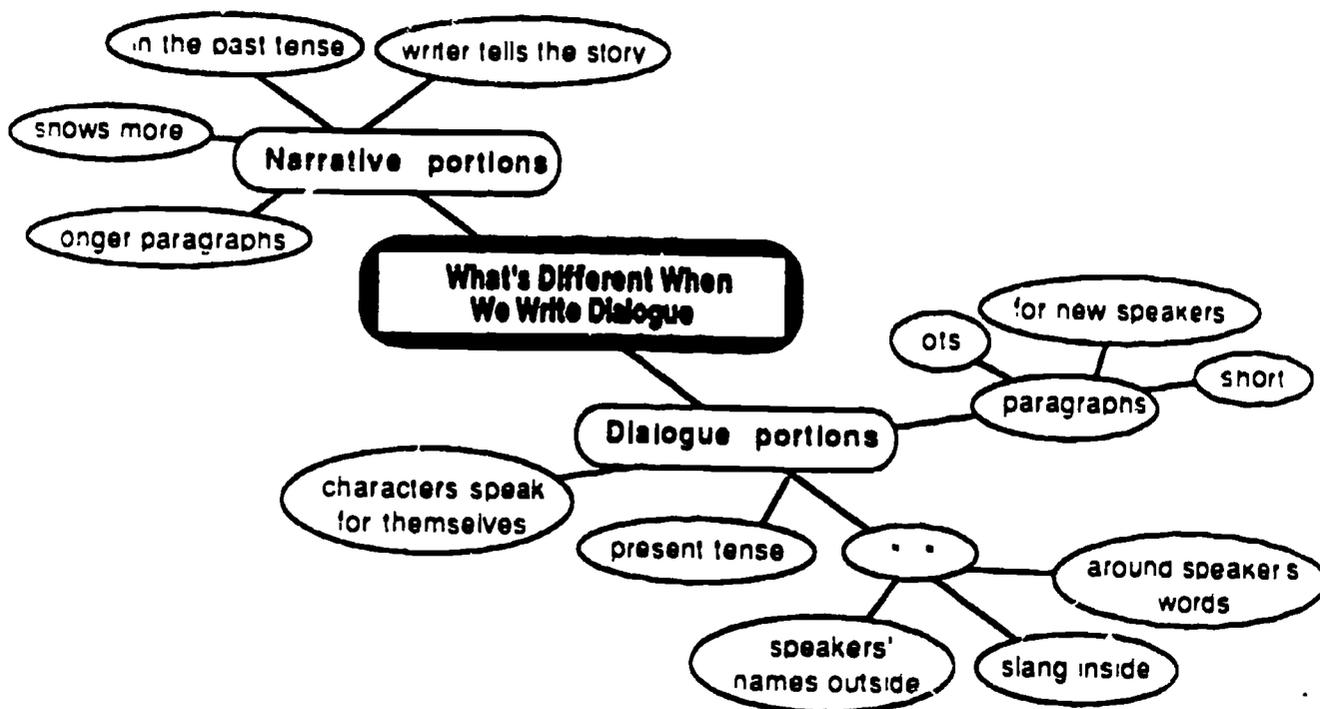| What Mrs. Jones Says	What Mrs. Jones Comments Tell The Reader	What Mrs. Jones Does	What Mrs. Jones Actions Tell The Reader	What Others Say About Mrs. Jones	What These Statements Tell The Reader About Mrs. Jones
Example: "You ought to be my son. i would teach you right from wrong."	Mrs. Jones still seems to have a maternal feeling toward Roger even though he tried to steal her pocketbook.	Example: Takes Roger home to make him a bite to eat.	Rather than blame Roger, she looks for a motive behind what he did. She decides he must be hungry to steal from her.	Example: She was a large woman with a large purse. It had everything in it but hammer and nails.	Mrs. Jones is a large, imposing and determined lady. You don't mess with Mrs. Jones.

After they have completed their individual charts, break the students who analyzed Mrs. Jones into groups of 3 or 4 to discuss the following questions:

•What did Mrs. Jones do after Roger tried to snatch her pocketbook?
•Why did she react the way she did?
•How did she feel about what happened?
•Based upon her feelings, what kind of action do you think she will take in the remainder of the story ?

4. Sharing Character Analyses: Now, pair up each student who analyzed Roger with a student who was assigned to study Mrs. Jones. Give each student 5 minutes to share with a partner:

•what each character did;
•why Roger and Mrs. Jones did what they did;
•how he/she is feeling about what has happened; and
•what actions each might take as a result.

5. Silent dialogue: Keep students in the same pairs--one who analyzed Roger and one who focused on Mrs. Jones. Direct them to look at the portion of "Thank You M'am" given to the class to read and to note the places where Roger and Mrs. Jones talk to each other. Then, ask the pairs to compare the sections of the story written in dialogue form with the other portions of the narrative. As a class, make a list or cluster of "what's different when we write dialogue." A sample cluster might look like this:

in the past tense • writer tells the story

snows more

Narrative portions

onger paragraphs

What's Different When We Write Dialogue

for new speakers

ots

paragraphs

short

Dialogue portions

characters speak for themselves

present tense

around speakers words

speakers' names outside

slang inside

Then, give the pairs a chance to practice writing dialogue in the roles of the characters they have just analyzed. They can begin their conversation with the end of the portion of the story they have just read . . ."The door was open . . ."

They may choose from the following dialogue starters below or select any other option that seems plausible to them:

To begin with Mrs. Jones

•"You eyein' that door pretty hard, boy. You fixin' to run?"
•"What you hungry for. son? I'm going to make you a meal you won't forget."
•"I was young like you once. boy. I know what it's like to want something that isn't yours."

To begin with Roger

•"You sure you ain't gonna take me to jail. M'am?"
•"Ok. I'll wash my face. What you got to eat?"
•"You turned me loose. Does that mean I can go if I want?"

Advise students that the goal of this exercise is not to complete an ending to the story but simply to expenence being in the role of one of the characters and to share their insights into what that character might sav with their partner. Once students finish their silent dialogues. have them read them aloud to see if they sound like Roger and Mrs. Jones.

Writing

Have students go back to their quick-wnte endings of "Thank You M'am" and see if their first impression of how the story would end still seems appropriate now that they have taken a closer look at the characters. They can also use their dialogues and character analysis charts in composing their endings to the story.

Revising

1   C r i t i q u i n g   M o d e l s . Have students read and discuss the following sample endings to "Thank You M'am," focusing on how each is effective and how each can be improved. You may wish to put these student models on an overhead and to record the students' comments as in the first example provided below

Effective to show what Roger is thinking. Seems like what would be on his mind.

The door was open. Now's my chance to get out of here. he thought to himself. Maybe I can sneak out when she goes to fix dinner. But she seems like such a nice lady. It wouldn't be right to just run away after I promised. Besides, she must trust me a lot to bring me in her home and open her arms out to me. She has even offered me a free meal. Nobody's ever done that before. But what if she calls the cops on me. Then I'll be sitting up in jail feelin' like a fool for not runnin' away when I had the chance havin' no one to blame but me. Still, if I run away I could probably never come back here in this neighborhood because she'd catch me and turn me in for sure.

Maybe some dialogue could go here between these two paragraphs that would. lead to Roger's next thought

Doesn't look like I've got much of a choice but to stay here anyway. I got no place to go, so I might as well take a chance and stay. After all, if she can trust me I should be able to trust her. She seems to be real lonely like me. Must be sad to live in this place all alone. Yes, I'll stay here and keep her company for a little while.

This is all telling instead of showing. The writer should turn this from a summary into a narrative.

The tense of the ending changed here.

Mrs. Luella Bates Washington Jones gives the young boy a bath and feeds him. After they have eaten, Mrs. Jones gives the boy a pair of her husband's old shoes but they are too big and she tells him that he will grow into them. Then she gives him some money to get him through the week. The young boy learns a valuable lesson about people and never steals a purse or anything again.

--Marcus Mumford

• • •

The door was open. He dashed out. As he ran down the flight of stairs. one thought crossed his mind--over and over again. Why does this stranger care so much about me? He became very curious as to why a perfect stranger would care about a kid who has just stolen their purse.

Just as Mrs Jones stepped out of the kitchen and into the living room. she saw him sitting on the couch. He was breathing heavily and in a deep sweat.

She asked, "Good heavens. boy what in God's name is wrong with you?"

"Nothin M'am. I guess it's the heat."

--Shelly Register

• • •

The door was open. Roger thought, Should I try to get away? Naw, she might catch me. Then she'll be sure to take me to jail.

"Boy, why you looking at the door like that? I done turned you loose and you want to get sneaky?"

"No'm." said Roger. "I was just thinking about the suede shoes."

Mrs Jones went over to her stove and started filling the two plates she had with food.

"Come and sit down, Roger."

"Yes'm." They both ate in silence chewing and savoring the food. Roger finished his food first and in a flash ran through the door and to the outside. He stopped outside her window and said, "Thank you, M'am, but I gotta go home." Then he was gone.

Mrs Jones sat in her in her chair thinking over what had happened in the last half hour, and it dawned on her that she'd never see that boy again--Well, at least the boy said thank you.

--Pam Barnes

After critiquing the sample student models, students can break into groups of three and discuss what is effective and what needs to be improved in their own endings.

2. R e v i s i n g C h e c k · l i s t : Individually, or in pairs, students can also review their ending using the following checklist. This will ensure that what they have written meets the requirements specified in the prompt:

Revising Checklist   **"Thank You M'am"**

This story ending:	Great	Good	Needs work
Reflects a close reading of the story			
Makes inferences about: •wnat eacn character says •why Roger and Mrs. Jones do what they do •how he/she is feeling about what has happened •what actions each mignt take as a result			
Logically weaves the actual story ending with writer's ending for the story			
Relies on snowing, not telling as a means of vividly conveying information			
Uses dialogue as a means of revealing character development			
Demonstrates an understanding of narrative structure			
Displays a knowledge of the conventions of written English (spelling, punctuation, grammar), especially those dealing with proper dialogue form			

N o t e : This check-list could also be used for teacher/student conferences.

Editing

Students should exchange papers with a new partner and check each other's work for proper dialogue form. Some guidelines for checking correctness follow:
Compare the dialogue places in the story ending with those in the printed version
  •Do they look alike?
  •Are they different? Where? Underline these parts.

Is there a paragraph change for each speaker change? Use a ¶ symbol to signal your partner that he/she needs to indent.

Are the exact words--and only the exact words--of the characters in quotation marks? If not, move them/add the quotation marks.

Are punctuation marks used appropriately with question marks?
  •Periods always go inside.
  •Commas always go inside.
  •Question marks and exclamation points vary.

Are speaker identifications set off from what they say by commas? If not, add them/move them.

Is the tense right?
  •Narration is in the past tense.
  •Dialogue is usually in the present tense.

Partners should also mark any errors that they notice in spelling, punctuation, grammar, and sentence structure.

Evaluation

The following scoring guide may be used for self, peer or teacher evaluation

Scoring Guide: "Thank You M'am"

Reading/Thinking: Check if this paper

☐ reflects a close reading of the story

☐ displays the writer's ability to make inferences about the story based on facts 'rom the story

☐ reflects an understanding of what each character does. why Roger and Mrs. Jones do what they do. and how he/she 's feeling about what has happened

☐ uses facts and inferences from the reading of the story to speculate about what actions each character might take as a result--(based upon their understanding of what has happened, why it has happened, and how he/she is feeling about it.)

☐ Reading/Thinking Subtotal
4 points possible

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Thinking/Writing. Check if this paper

☐ 'ogically weaves together the facts and inferences that the writer gleans from the actual story with what he or she speculates about the story's ending

☐ relies on showing, not telling, as a means of vividly conveying information

☐ relies on dialogue as a means of character development

☐ displays an understanding of narrative structure

☐ Thinking/Writing Subtotal
4 points possible

Writing/Editing: Check if this paper

☐ uses paragraph change to show each speaker change

☐ encloses the character's exact words--and only his or her exact words--in quotation marks

☐ displays knowledge of how to use punctuation in conjunction with quotation marks:

•periods inside
•commas inside
•question marks inside a direct quote or outside if whole statement is a question
•exclamation marks inside a direct quote or outside if whole statement is an exclamation

☐ sets off speaker's identification from what he or she says with commas

☐ sets dialogue in the present tense

☐ sets narration in the past tense

☐ Writing/Editing Subtotal
6 points possible

☐ Total Score
14 points possible

Extension Activities

Analysis

Provide students with Langston Hughes' ending to "Thank You M'am." The remainder of his story is printed below:

He could make a dash for it down the hall. He could run. run. run. run!

The woman was sitting on the daybed. After a while she said. "I were young once and I wanted things I could not get."

There was another long pause. The boy's mouth opened. Then he frowned. not knowing he frowned.

The woman said, "Uh-hum! You thought I was going to say, 'but. I didn't snatch people's pocketbooks. 'Well, I wasn't going to say that.'" Pause. Silence. "I have done things, too. which I would not tell you. Things I wouldn't tell God, if He didn't already know Everybody's got something in common. So you set down while I fix us something to eat You might run that comb through your hair. Then you will look presentable."

In another corner of the room behind a screen was a hot plate and icebox. Mrs. Jones got up and went behind the screen. The woman did not watch the boy to see if he was going to run now. Nor did she watch her purse which she left behind her on the daybed But the boy took care to sit on the far side of the room. away from the purse. There. he thought, she could easily see him out of the corner of her eye, if she wanted to. He did not trust the woman not to trust him. And he did not want to be mistrusted now.

"Do you need somebody to go to the store?" asked the boy. "Maybe to get some milk or something?"

"Don't believe I do," said the woman, "Unless you want sweet milk yourself. I was going to make cocoa out of this canned milk I got here."

"That will be fine," said the boy.

She heated some lima beans and ham she had in the icebox. She made the cocoa and set the table. The woman did not ask the boy anything about where he lived. She didn't ask about his folks. or anything else that would embarrass him. Instead, as they ate. she told him about her job. She worked in a hotel beauty shop that stayed open late. All kinds of women came in and out, she said. Then she cut him a half of her ten-cent cake.

"Eat some more, son." she said.

Soon they were finished eating. She got up and said. "Now. here. take this ten dollars and buy yourself some blue suede shoes. And next time, do not make the mistake of latching on to my pocketbook nor nobody else's. Shoes got by devilish ways will burn your feet. I got to get my rest now. But from here on, son, I hope you will behave yourself."

She led him down the hall to th front door and opened it. "Good night! Behave yourself, boy!" she said, looking out into the street as he went down the steps.

The boy wanted to say something other than, "Thank You M'am," to Mrs. Luella Bates Washington Jones. But although his lips moved he couldn't even say that. He turned at the foot of the barren stoop and looked back at the large woman in the door Then she shut the door. And he never saw her again.

Prompt: You have just read Langston Hughes' ending to "Thank You M'am." Compare and contrast his ending with the ending you wrote. What parts of your stories are alike? How are they different? What ending do you like the best and why?

Application

Turning Your Ending of "Thank You M'am" Into a Screenplay/Drama

1. You have learned that short stones often contain dialogue. *Dialogue* is a term used to refer to conversation between characters. Dramas have dialogue, too. but there are different conventions for writing dialogue in a drama. A *convention* is an agreed-upon way of writing something.

2. Look at two or three scenes from plays. Now, look back at the dialogue cluster and checklist for writing dialogue in the lesson we have just completed. Use these as a model to make a cluster and checklist for dramatic dialogue.

3. Compare your checklists. How are they alike? How are they different? Complete a Venn Diagram for dialogue. Model the one below.

Dialogue

Short Stories

Both
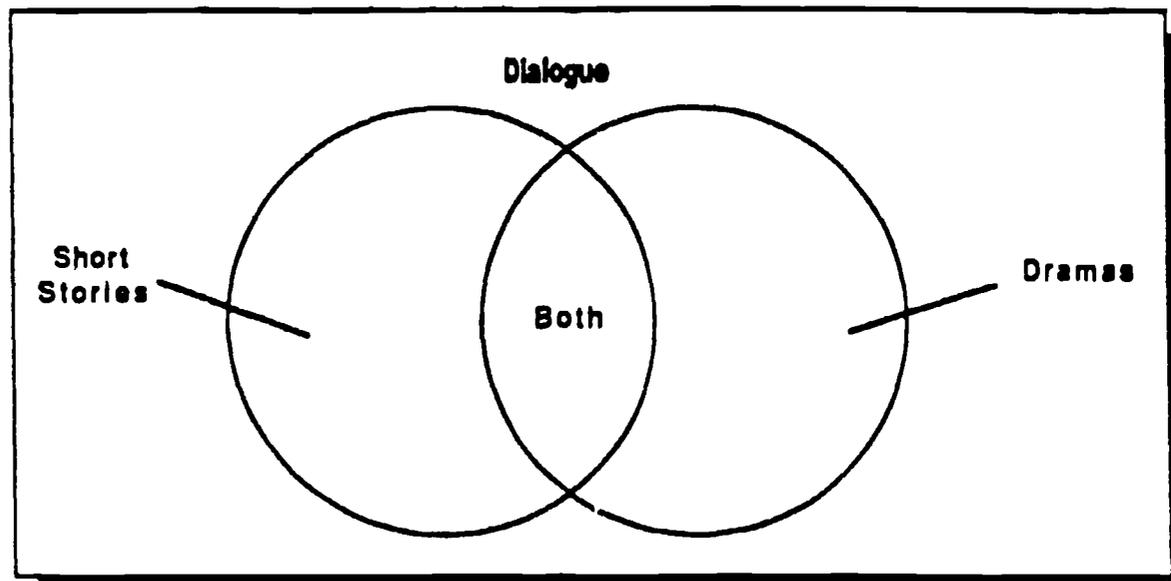
Dramas

Prompt: Now, using a scene as a model and referring to your CHECKLIST FOR DRAMA DIALOGUE, adapt your ending of the story, "Thank You M'am" for production. When a wnter changes the *genre* or kind of writing from a novel or short story to a drama. we call him a "screenwnter." When you have completed your adaptation, you will be a screenwriter too.

4. Find some partners.

5. Assign jobs. You'll need a stage crew, a prop crew, a costume crew, a cast, and a director.

6. Get your jobs done. For the stage crew, that means creating scenery. For the prop crew, it means finding tables, chairs, and other props and setting them up and taking them down. For the costume crew, it means finding clothes, shoes, and jewelry for the characters. For the cast members, it means memorizing and rehearsing lines.

7. Produce your play for an audier :e.

Taffy E. Raphael
Carol Sue Englert

Writing and reading: Partners in constructing meaning

Raphael and Englert codirect the Cognitive Strategy Instruction in Writing project of the Institute for Research on Teaching at Michigan State University where they are both Associate Professors of Education.

In early October, Samantha and her fifth-grade classmates were asked to write an expository paper. They were asked to think of something they knew a lot about and to explain their topic to readers who knew little or nothing about it. The class discussed many possible reasons why they might need to explain something, including describing how to get to their house from school for a friend who was visiting, explaining how to make something in art, and explaining rules for a game. Samantha chose the latter and wrote:

> I had to explain how to play Trivia Adventure she cought on quick. I was fun playing but you have to answer questions some are hard like for example their is 1 & 2 for A and 1 & 2 for B A is easy B is hard and That is how you play.

Anyone reading this paper would be challenged to play or even identify the game as Samantha described it. She provided no sub-stantive information about her topic. Instead, she gave her audience personal feelings and opinions about the game without supporting details. Yet, follow-up interviews with Samantha suggested she possessed a wealth of knowledge about how to play the game. Samantha had problems sustaining her thinking about her topic and perceiving what information was vital to her audience.

Her paper also illustrates a lack of purpose, and she provides readers little context. Her insensitivity to the needs of her audience may be due to the fact that she assumed the only readers would be adults (e.g., her teacher) who, in the eyes of many children of that age, already know the information. It is further apparent that Samantha did not know the requirements of the explanation text structure because she did not include any information about requisite elements such as materials or steps.

Another activity Samantha and her peers completed involved reading an expository selection, either about bats and owls or dolphins and fish; then they wrote whatever they could remember from their article. Samantha's recall about bats and owls demonstrated problems similar to those found in her explanation: It lacked organization and sustained thinking, and it missed many of the key points in the article. She recalled:

> My story is about bats and owls. Most animals are awake during the day but bats and owls sleep during the day and eat at night. The difference between the two are bats sleep in a cave with

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many other bats they sleep upside down owls live in trees and if they tried to hang upside down they would fall off.

It is interesting that Samantha used the term *My story* to introduce information that is definitely not a story. Further, while she focused on the primary similarity of bats and owls as nocturnal animals, she contrasted less important information from the text about how they sleep rather than key information contrasting how they obtain food.

Many problems are apparent in Samantha's expository writing and recall, problems that have been noted in the writing and recalls of other upper elementary school students (Raphael, Englert, & Kirschner, 1986), learning disabled students (Englert, Raphael, Anderson, Anthony, Fear, & Gregg, 1988), and secondary students (Applebee, 1984). The problems include students' (a) inability to sustain their thinking about topics, (b) poor organizational skills, (c) insensitivity to audience needs (e.g., not setting contexts, no use of text signals), (d) failure to provide a purpose, (e) inability to perceive themselves as informants with information to share, and (f) poor use of conventions of print.

We have been exploring ways to improve elementary students' writing and reading of informational, or content area, texts (Englert & Raphael, in press; Raphael, Englert, & Kirschner, 1989). In an earlier article (Raphael, Kirschner, & Englert, 1988), we described the Expository Writing Program (EWP) as one way of improving the informational writing of poor readers. This instructional program features a set of curriculum materials, or think sheets, that guide students through planning, organizing, writing, editing, and revising components of the writing process. Research about the effect of using the EWP think sheets as a basis for instruction showed that students' writing improved, as did some aspects of their reading comprehension (e.g., Raphael et al., 1988). However, although we were satisfied with the curriculum *materials*, both the teachers and the researchers were concerned with the ambiguity of the actual *instructional* guidelines.

Whereas the think sheets served as a guide for defining the content of instruction, in and of themselves they provided little information about how to develop students' knowledge of the writing process. In EWP, teachers

focused on explaining the questions on the think sheets and working the students through the writing process. However, the teachers did little writing themselves and little modeling of *why* the think sheets were useful or *how* they could support a nonlinear, constantly changing process of writing. Teachers' discourse about writing was procedural, providing little insight into the thinking that directed the writing process, strategy use, and peer collaboration. Also, few direct links were made between the thinking underlying writing information texts and the thinking that leads to successful comprehension of such texts.

Further, teachers who had read the article, used the materials, or participated in EWP workshops raised many other questions that encouraged us to expand aspects of that program. The questions included requests for more information about students' writing and reading problems, samples of the think sheets, and ideas for using think sheets to draw connections to comprehension activities. These questions and our own desire to improve the EWP led to the development of the Cognitive Strategy Instruction in Writing (CSIW) program.

In this article, we describe CSIW as we address three questions: (a) What knowledge bases are useful for expository writing and reading? (b) What features of instruction inherent in CSIW help build knowledge for successful writing and reading? and (c) What is the effect of CSIW on students' expository writing and reading?

Knowledge bases for writing and reading Informational text

Many authors have written about the knowledge bases underlying writing and reading in general. For example, writers and readers need to know about and have authentic purposes (Graves, 1983; Hansen, 1987) and audiences (Hansen, 1983). They must also understand the needs and expectations of authors and readers (Tierney & LaZansky, 1980). Research on expository text demonstrates that comprehension is enhanced when students understand different text structures (e.g., Armbruster, Anderson, & Ostertag, 1987; Taylor & Beach, 1984), possess strategies for creating plans (e.g., identifying audience, purpose, ideas), use text organization and text signals throughout the writing proc-

ess, and have self-regulatory abilities to direct writing and reading (Englert et al., in press; O'Flahavan & Tierney, in press). The curriculum of the CSIW program focused on ways to facilitate students' development of this knowledge base, provided opportunities for them to practice using this knowledge, and offered ways to encourage independent writing and successful comprehension.

Features of Instruction

Both writing and reading are largely invisible processes. A teacher cannot ask a student to watch her write or read and expect the students to see the sustained thinking that is involved or the use of text structure knowledge to generate text, to organize ideas, or to predict upcoming content. Thus, one of our first decisions involved how to make these processes visible.

We chose to begin with writing. By beginning with writing, students learned firsthand about the decisions authors must make in selecting topics, determining how to present information, and identifying purposes, relevant audiences, and author/reader relationships.

CSIW provided opportunities for making the writing and reading of informational text more visible and accessible to students. Fundamental to doing this was helping teachers and students develop a common language about the processes and strategies underlying informational writing and reading and then helping them use the language as they made the writing and reading processes visible and accessible.

CSIW made the process visible as teachers (a) thought aloud, modeling their own writing and their analysis of texts written by others and (b) provided think sheets to give concrete reminders of the thinking appropriate throughout the writing process. Thinking aloud while modeling gave students a window into what more skilled writers and readers consider when faced with producing or analyzing informational text. This also helped them better understand the kinds of decisions authors make while writing and decisions the students may assume authors of their content area texts and trade books make. The think sheets included questions, statements, and graphic organizers that emphasized strategies relevant to different aspects of the writing

process and to extracting information from text when reading.

The instructional process focused on four recurring phases: (a) text analysis, (b) modeling the writing process, (c) guiding students as they wrote, and (d) providing students with opportunities for independent writing. To illustrate this instructional process, we include sample interactions between teachers and students.

Text analysis. Links between writing and reading began with the first phase, text analysis. Text analysis is fundamental to critiquing one's own writing and making decisions to improve it; it is also essential for making decisions about what is important and should be remembered in texts written by others. Features such as text signals and questions addressed in a text are valuable guides to determining what to include as one generates ideas; these features also aid in determining what an author may have hoped the reader would remember from a text.

Teachers modeled text analysis by responding to passages that had been written by fourth-and fifth-grade students from a previous year. Using actual writing samples makes the links between writing and reading more visible as students see that what is written today becomes text to be read tomorrow. The first text typically displayed was a relatively well-written explanation that contained key words and phrases and had an informative introduction but still had areas in need of improvement.

Elaine, a fifth-grade teacher, used the following passage:

Traveling By Plane

Are you bored? Then take a trip. It's fun—I did! I was real scared at first but you'll get used to it. First, you buy your ticket at the security desk. Next you take out all your clothes and see what you're going to take. Third, you pack what you're going to take. Oh, you can only take two suitcases at a time. Then you get on the plane and sit in the seat you're assigned to. You can eat on the plane and do activities. You can only stand up when the plane is in the air. Last, you're there.

Elaine began to model text analysis by noting the topic of the text, its apparent purpose, and the kinds of questions she expected the text to address. Displaying the passage on an overhead projector, she said:

Elaine: I have a paper that I'd like to share with you, written by one of my students, Den-

nis, last year. Let's read this together. [Reading occurs.] Something I noticed right away when we were reading is that Dennis is explaining how to take a trip. I know he had just been with his family on a vacation and had talked a lot about how much he liked the trip. I had some clues that told me that this was an explanation. One of my clues was he started by writing, "Then take a trip." It made me wonder if this was going to be about how to take a trip. He also wrote some things about what he would need. Do you notice any?

Students: A ticket
Two suitcases
Clothes

Elaine: Exactly! I also noticed that he wrote about the steps that I'd have to follow to do the same thing. Like, his paper says, "First you buy your ticket..." and "Third, you pack...." Any other steps you notice?

Students: You get on the plane.
You take out your clothes.
But you have to decide which ones to take, you can't take them all!

Elaine continued in this way until she and her students had discussed purpose, audience, materials needed, and steps. She then explicitly noted the use of key words such as *first* and *next*. Finally, she elicited from students additional information that might have been helpful or might have made the paper more interesting, including how you decide about the clothes to take, what activities you can do on a plane, and what made Dennis scared. Implicit throughout Elaine's lesson was how writers make comprehension easier for their readers. Using student passages of varying degrees of quality, students took an increasing role in analyzing each as they learned about implicit questions, signal words, introductions, and so forth.

Modeling the writing process. Once students had a rudimentary awareness of the text structure concept and its related key words and phrases, the second phase began. Elaine modeled how to write the type of papers that they had just read and analyzed. As she planned, she thought about answering implicit questions such as "Who will read my paper?" "Why am I writing this paper?" "What information do I want to include?" Teachers varied in how they approached their modeling. Many chose to model writing on topics that had a real purpose. One teacher modeled writing a piece on how to play a variation of dodgeball so that her students could read about it before playing at recess. Another teacher modeled writing about an art project that she and her

friends would be doing.

Elaine modeled explanatory writing: how to make peanut butter fudge. After making fudge in their classroom, Elaine said:

Elaine: We're going to write an explanation about how to make peanut butter fudge. I think that won't be hard since we all know a lot about how to make it now that we've done it once. I always find it easier to write about something if I know a lot about it. Let's see...I need to decide who will be reading this so I know what information to include.

Students: Mom
Sister
Me and my friends

Elaine: OK, so we need to write it for someone that may not know anything about how to do it. I think one of the first things I'll need to think about is: What materials or ingredients do I need? What's involved in this? Help me to remember all that we need to include.

Elaine listed on the overhead transparency the many ideas students generated, without editing the ideas in any way. After eliciting ideas from students about needed materials, she asked the students about steps to include. In this way, a second basic question about explanations was addressed: What are the steps? The students generated a rather disorganized list that included ingredients, steps, and events specific to their classroom activities such as Matthew eating the first piece of fudge and Cosette licking the spoons clean. She then modeled how to group these ideas into categories such as steps, materials, events, and purposes.

This sample interaction illustrates the way in which Elaine made visible the invisible process of planning and introduced students to basic questions related to writing explanations (What are the materials and steps?). Elaine then introduced the first think sheet, the *Plan* think sheet, not as a worksheet to be evaluated by the teacher, but as something that helps writers record their thinking so that they can refer to it later.

Elaine: Oh dear! It's time for us to go to lunch and we haven't had a chance to write our explanation yet. I'm afraid I'll forget all these good ideas to include in the explanation and will have to start all over again tomorrow. I just hate starting over! I have something that I use to help me remember my ideas when I write, and I'm going to use it right now before we go to lunch. You can help me get my notes down and we'll use these tomorrow when we work on our paper again.

Figure 1
Elaine's *Plan* think sheet

Author's name _Mrs. B._   Date _____

TOPIC: _Making Peanut Butter Fudge_

WHO: Who am I writing for?
Parents, brothers, sisters, + friends of my students

WHY: Why am I writing this?
_So my students can make peanut butter fudge at home,
+ so we can remember how we made it in school_

WHAT: What do I already know about my topic? (Brainstorm)
we made it after lunch
1. _peanut butter_   _Matthew got the first piece._
2. _chocolate_   _need an "8" pan (a square)_
3. _measuring cups_   _tastes great!!!!_   _taking turns stir..._
4. _Cosette got to lick the spoon clean_   _salt sugar_
wooden spoons glass bowls need patience stirring
it was a surprise

HOW: How do I group my ideas?

Materials I'll need	Steps
Chocolate - 2 ounces	melt chocolate + peanut butter
hot plate, bowls, wooden spoons	took turns stirring
aprons, buttered pans	add things
peanut butter 2 cups sugar	put in refrigerator
measuring cups	

Things that happened when we made it	Beginning + ending ideas
Cosette licked the spoon	tastes great!!
We put on aprons + took turns	Matthew took the first bite
we ate fudge at recess	we wanted to make it again

Elaine's completed *Plan* think sheet is presented in Figure 1. Note that Elaine explained why keeping notes can be valuable for writers since they rarely are able to complete a writing activity in one sitting.

Elaine's use of the think sheet illustrates how it was intended to be used. As she completed it, she explained that they were (a) personal records, not worksheets to be turned in for correcting, (b) flexible tools, with the author making decisions about the order in which to take notes, (c) something to be used to *prompt* thinking about their papers, not to *direct* their thinking, and (d) something to be used as a basis for *discussion*, not an isolated activity. It is important to understand that think sheets should not be handed out to students to complete individually and inflexibly. In fact, once students become comfortable with these processes, they may wish to generate their own think sheets to guide the writing of their specific papers.

The next day, Elaine modeled how to take the information she had brainstormed, evaluate what was important (what to add and what to omit), consider interesting introductions, and make decisions about how to order information. She then introduced the *Organize* think sheet as a way to prepare to write a first draft. Later the *Edit* and the *Revise* think

Figure 2
Lauren's *Plan* think sheet

Author's name LAUREN   Date _____

TOPIC: _how to play Monopoly_

WHO: Who am I writing for?
friends, Relatives , brothers/sisters
grandpa, uncle
WHY: Why am I writing this?
   to tell people how to play Monopoly

WHAT: What do I already know about my topic? (Brainstorm)
1. you chouse the banker + the real estate by rolling the die and getting the highest no
2. needs a playing piece
3. needs 2-500, 3-100, 4. 50s, 5. 20, 6-10, 5 5 and a parking
4. a sea in the middle of the board for free parking
5. you take turns rolling 2 dies
6. you can buy property on your 2nd time
7. you buy property by landing on it

HOW: How do I group my ideas?

how to start	RULES
a playing piece, money, banker, real estate, 500 in the middle for free parking, 2-6 players.	You take turn rolling 2dies. You choose the banker + real estate by rolling 1 die and getting the no. You can buy properties on your 2nd time around

How to lose	✗
You lose by loseing all your money	

sheets were introduced as tools to promote thinking and dialogue among the teacher and students at the revision and editing stages. These think sheets are illustrated below.

Guided writing. In the guided writing phase, teachers provided students with the opportunity to write papers on topics of their own choosing. The only restriction was to use the text structure they had been studying. Elaine drew connections to her earlier modeling by initiating a discussion of how authors decide what to write about, stressing the importance of audience and purpose. After the discussion, she asked students to share some of their ideas for explanations they would like to write, including why they were interested in writing about their topic and who they would like to read their papers.

She then had the students think about and record on a think sheet their plans for writing an explanation. Figure 2 shows Lauren's *Plan* think sheet for her paper on playing Monopoly. Notice how Lauren used the general guidelines on the think sheet but restructured it to fit her needs, using three categories for grouping her ideas and adding additional lines to the brainstorming section.

After generating their plans, students were asked to use an *Organize* think sheet to make decisions about the order in which to

Figure 3
Lauren's _Organize_ think sheet

WHAT IS BEING EXPLAINED?	How to play Monopoly
WHO OR WHAT IS NEEDED?	Rules+ 2-6 people, game of Monopoly maybe a table
SETTING?	in your room or den or kitchen
WHAT ARE THE STEPS?	FIRST. Rules: 2-6 people choose banker & real estate, you can buy houses when you get all of a color
	NEXT. start-get a playing piece, $300.00 in the middle for free parking, get 2-500's, 3-100's, 4-50's, 5-20's, 6-10's, 1-5's & hand out your money
	THIRD. You want to buy properties because when person lands on yours they have to pay the rent. You need four houses to buy a hotel
	THEN. lose: by losing all your money (win) by being the last one in the game
	FIFTH.
	FINALLY.

present their ideas. *Organize* think sheets differed for each text structure; each was designed to help students include information related to specific questions and key words to help their readers find the information. Lauren's completed explanation *Organize* think sheet is presented in Figure 3.

Elaine emphasized the recursive nature of writing since many students realized, only after beginning to draft their paper, that they needed more information or needed to consider a different sequence of information than originally planned. This was prompted not only through discussion but also with the help of *Edit* think sheets. Figure 4 illustrates Lauren's self-analysis of her first draft.

After self-analyzing and discussing her paper with one of her peers, Lauren then considered all the advice she had received and made decisions about what changes she would actually include in her final draft. Her

Revision think sheet (see Figure 5) prompted her to incorporate suggestions from her peers, teachers, and her own analysis by asking her to list suggestions received, decide which ones to implement, and then to go back to her first draft to make her changes. Thus, the final decision for revisions was her own, regardless of the source of the suggestions.

Independent writing. The independent writing phase, which moved students toward independence, actually involved two phases. First, students wrote a paper that involved the same structure as the one modeled. To accomplish this, they relied on think sheets when needed, worked on their own and with their peers, and eventually published their work in a class magazine.

The second phase occurred after students had learned about and written four informational texts, two each employing explanation and comparison/contrast text structures. They

Figure 4
Lauren's *Self-edit* think sheet

READ TO CHECK YOUR INFORMATION

(First, reread my paper)

What do I like best?

Why? party propeties
because I'm having a party

What parts are not clear? hotel

Why not?
getting them

QUESTION YOURSELF TO CHECK ORGANIZATION Did I . . .

Tell what was being explained?	(YES)	SORT OF	NO
Tell what things are needed?	(YES)	SORT OF	NO
Make the steps clear?	YES	(SORT OF)	NO
Use keywords to make it clear?	YES	(SORT OF)	NO
Make it interesting to my reader?	(YES)	SORT OF	NO

PLANNING A REVISION (Look back at the draft)

What parts do I want to change?

explain hotels

explain steps

What questions do I have for my editor?

Was it boreing, why?

was the hotels clear? if not why?

---

then learned a generic structure called *expert*. As experts, they created structures that best fit the topic and questions *they* wanted to address. Expert emphasized the idea that we rarely find pure structures such as explanation or comparison/contrast in texts we read or compose. Rather, structures usually reflect combinations that the authors put together to best suit their needs.

Thus, students learned to make their own decisions about the questions they wished to address and how to organize information in their writing. They also learned valuable text analysis skills that enhance comprehension of text.

Over time, the CSIW program and its curriculum components became part of the classroom tools available for students' independent use during any related reading and writing activities. For example, students in one classroom began using the organization think sheet when writing answers to questions after sections and chapters in their social studies and science texts.

The think sheets were particularly useful for students working collaboratively to write reports in social studies. The students generated their plan by identifying the knowledge they already had, the questions they wanted to address, and their intended purpose and audience. Next, they used their plan to guide the selection of the library books and to guide their reading for specific information. Finally, they used an expert *Organize* think sheet (see Figure 6) to draft their reports.

This type of activity lies at the intersection of reading and writing as students independently consider what they know, make decisions about how to gather information, read, and then write. Other students used the *Edit* think sheet with some modifications to double check essays they wrote in response to

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Figure 5
Lauren's Revision think sheet

SUGGESTIONS FROM MY EDITOR

List all the suggestions your editor has given you:

* 1. _put more key words_
  2. _be more specific about the money part_
* 3. _be more specific about the hotels_
* 4. _be more clear about steps_
  5. _____
  6. _____

DECIDE ON THE SUGGESTIONS YOU WANT TO USE

Put a * next to all the suggestions that you would like to use
in revising your paper.

MAKING YOUR PAPER MORE INTERESTING

Consider ideas for making your paper as interesting to your reader
as you can: Does your introduction grab your reader? _yes!_ What will make
your reader want to finish the paper? _how to play_ List other ideas below:

maybe add ending different
_____
_____

RETURN TO YOUR DRAFT

On your draft, make all the changes you think will help your paper. Use
ideas from your list above, from your self-edit think-sheet, and any other ideas
you have for your paper. When you are ready, you can write your final copy.

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selections read during reading group activities.

Changes in students' expository writing and reading

The greatest measure of the success of an intervention program is its benefits to the students involved. Information about the writing and reading behaviors of Samantha and three of her peers illustrates the variety of benefits students experienced.

In January, Samantha wrote an explanation that again focused on a game. This paper reflects the benefits of engaging in writing as a process and receiving feedback from her teacher and peers. Notice her improved introduction and her inclusion of relevant information about what she is explaining (who or what is involved, and the steps in the game):

Monopoly

Do you know how to play monopoly? Well, if you don't I'll show you. Get ready, here we go.
First you need to know what materials you need: Game board, dice, people and money.
Secondly you need people. Up to six people can play at a time.
Thirdly, you need to know the steps. You are not ready to play yet, because you don't have any money. You need 2 five hundreds, 2 one hundreds, 2 fifties, 6 twenties, 5 tens, 5 fives, and 5 ones = $1,500. The way you get money is if you pass go land on FREE PARKING.
Now you may begin. Here we go. Roll the dice then move your piece. If you land on something you want to buy, you may. Then you may get a card. If somebody lands on it they pay you rent. You do not have to buy if you do not want.
Finally, you win when everybody runs out of money.

Samantha produced a paper that reflects her sustained thinking, effective use of organizational strategies, attention to detail and needs

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of her audience, and sense of self as inform-ant.

In May, Samantha showed similar knowl-edge and confidence as she related informa-tion learned from reading a passage about dolphins and fish. She introduced key con-cepts in separate paragraphs and used text sig-nals so her audience might predict upcoming information. In her introduction, she signalled a knowledge of the difference between sharing information and telling a story:

> Hi I am going to tell you about Dolphins and fish.
> First, the way they breathe a fish has gills it opens let's water get in closes and oxygen comes out. A dolphin breaths like this there is an airhole in top of his head he goes to the surface of water to breathe.
> Second, a dolphin can go for six or seven minutes without air. A fish can not.
> Third, when a dolphin gets sick another dol-phin will push the sick one up to the surface for air. Now fish will not do that.
> People think fish and dolphins are alot alike but with dolphins and fish it's not true.

Her newly developed knowledge of compari-son/contrast and the importance of parallel traits can be seen in her use of contrasting statements (which were not explicit in the original passage) such as *A fish can not* and *Now fish will not do that.*

Larry, a low-achieving student, showed similar patterns of development. In October, he wrote an explanation about how to be cool, a topic that he indicated a great deal of knowl-edge about and one he willingly shared throughout the year. However, in his October paper, he wrote:

> Well, guys are cool as you can see they are acually the best in town right buddy? Well that is all right you now.

Like Samantha's earlier work, Larry's paper was quite brief, lacking sustained thought in spite of his extensive topic knowledge. He set little context, merely signalling the beginning of each sentence with the word *well*. His lack of audience sensitivity is obvious in th ambi-guity of the last sentence which might have meant "That is all right now," "That is all I'll write you now," or "That is all right, you know."

Larry's composition written in January showed improved sustained thinking, context setting, and better audience sensitivity as he explained how to boil an egg. Even with a less interesting topic, he maintained his voice as an author, made clear statements about necessary

Figure 6
Expert Organize think sheet

1. How can I group my ideas into categories?
2. How can I order my ideas?
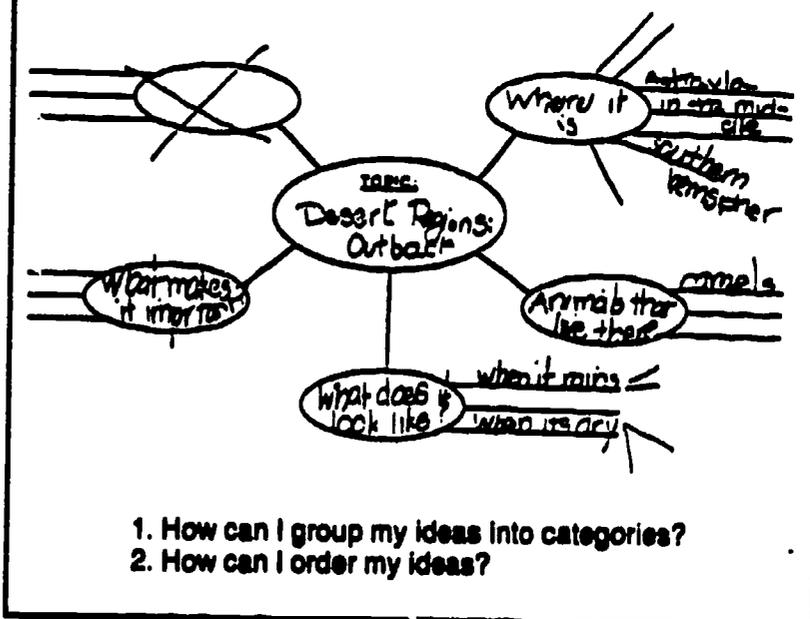
materials and steps, and included signal words and phrases about upcoming information.

> Boy I'm hungry, aren't you? Ya. All I have is eggs. That's OK, Let's boil an egg. How about one at a time? Cool with me.
> Now, let's boil an egg. First these are the things you need: a pot of cold water, a spoon, an egg, and don't forget you need a stove. Secondly, put the cold pot of water on the stove. Then put the egg in the pot. Put the pot on left rear, then turn left rear dial of the stove for 20 minutes. After 20 min-utes turn the dial off. Drain the water off the eggs. Let it cool off. When it's cool crack the egg and peel the shell off and eat the delicious egg. Mmm mmm, yum, yum. Eat well and hardy.

Larry's text still contains problems such as lack of punctuation and missing articles. However, his writing had dramatically im-proved, and these problems did not interfere with comprehension. Further, he had other opportunities to address mechanical changes throughout the year.

In addition to changes in students with se-rious writing and comprehension problems, we also saw growth in higher achieving stu-dents. In October, following a discussion of reasons why writers compare and contrast, David wrote:

> First, I will compare/contrast Chicago and Lansing. Chicago and Lansing are different be-cause Chicago has more buildings, highways, pol-lution, people, and doesn't have as much forets and woods as Lansing. Chicago and Lansing are alike because they both have houses, buildings, people, highways, sight-seeing places, etc. Now I shall

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compare/contrast Monopoly and Clue. Monopoly and Clue are alike because in both games you move around the board getting stuff to help you win the game. They are different because in Monopoly you go around the board collecting money and buying property, as in clue you go around the board looking for clues and guessing.

David's sample indicated a higher level of understanding of comparison/contrast, of informational writing, and of conventions of print than samples of less able students. However, his sustained thinking and purpose reflect a view that writing is a school task, and that audience refers to a teacher whose primary goal is to check his knowledge of text structure. To fill the page, he abruptly shifted to a second and unrelated topic to compare and contrast.

David's paper written in March illustrates his integration of newly acquired skills, in this case, the use of conversation to provide transitions and maintain reader interest. His topic was comparing apples and oranges:

"Hey, Bob!"
"Yeah, what do you want?"
"Do you want an apple or orange?"
"Sure!"
"Which one?"
"Gee, I don't know Pete. I like them both."
"Well, I'll compare/contrast them to help you figure it out."
"Thanks."
"First I'll compare/contrast them on their growth. Apples & oranges both grow in orchards.

Both have blossoms and both blossoms are white, both grow in trees and both have seeds! But oranges grow in warm climates and apples grow in temperate regions."
"Wow tell me more, Pete!"
"Second I'll compare/contrast their texture and taste. Oranges have a rough skin and apples have a smooth skin. On the apple you can eat the skin, on the orange you can't. The orange is a citrus fruit and the apple isn't. The orange is sweet or sour. The apple is sweet or tart. The only thing alike about them is that they can both be made into juice!"
"Neat, so which one are you recommending so far?"
"I'm not telling!"
"Thirdly I'll compare/contrast their design. Both are round and edible. Both have skin and both can be made into drinks!" They're both loaded with vitamin C and they both have seeds! But the orange has a thick skin and the apple has a very thin skin. Very few oranges are seedless, but apples are never seedless!
"One more thing to compare/contrast and then you can make your pick."
"Whew."
"Their color..."
"Ow wow."
"Finally the orange is, guess, orange. The apple is red or green on the outside and white in the middle."
"So which one are you recommending to me?"
"The apple."
"Why?"
"Because I like the orange better!"

David's growth can be seen in his focus on substance over form. He has not forgotten the importance of including information that responds to the implicit questions invited by comparing and contrasting, but he uses the information to inform as well as entertain his reader. His sensitivity to audience can be seen in his purpose-setting introduction, his use of text signals, his attention to dialogue to maintain his paper's momentum, and his clever ending. He maintained his author/reader relationship while he also provided the reader with information about the two different fruits. Most importantly, he clearly used what he had learned about writing/reading relationships as he gathered and presented information and created an interesting and informative report. Similar changes were seen in his recall of expository text.

Finally, Mark, an average achiever, provides insight into changes in students' ability to articulate their knowledge about writing, their perspectives about the purposes of writing, and how this knowledge is used to analyze expository text. In an interview format (Englert, Raphael, Anderson, & Fear, 1988), Mark was asked to give advice to a hypotheti-

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Figure 7
Tom's writing sample

Thair are meny steps you must follow to mak cukies. you mak them outside   Joe liks cukies.

Makeing cukies is diffrent in many ways from makJing cakes. I lik chocolate cake best. Do you?

When I mak cukies, I sometimes have a problem I go and ask my big brother. Then every thing is ok. We eat our cake before dinner.

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cal student, Tom, who was planning to turn his paper (see Figure 7) in to the teacher for publication.

Before CSIW, Mark focused almost solely on conventions of print, suggesting that Tom "indent each paragraph, correct all the spelling on the paper, every spelling error, and correct the spacing, it's not right." He suggested one meaning-based addition, that Tom should add, "my friend" so the sentence about Joe would read, "Joe, my friend, likes cookies." Mark did not appear to notice the paper's inconsistencies, superfluous information, and lack of an explanation of how to make cookies.

In contrast, Mark's interview in May revealed a concern for meaning, recognition of the importance of considering the implicit questions a paper should address, and understanding of alternative text structures used by writers and readers.

Mark: [reading the paper aloud]: You make cookies inside [changes "outside" to "inside"]. Who is Joe? We're explaining how to make cookies [crosses out "Joe likes cookies"]. And making cookies is different from ways you make cakes. Are you comparing/contrasting cakes and cookies?

Interviewer: What if he is?

Mark: I don't know, he never said that up here. He should have said I am going to compare and contrast cookies and cakes. Oh, I've got an idea, it wouldn't be a compare and contrast because he is explaining how to make cookies. He said there are many steps to follow to make cookies but it wouldn't be a compare/contrast if you were saying there are many steps you follow to make cookies. And I just don't know why he brought in this cake thing because it has nothing to do with making cookies. [Mark removes the middle paragraph.]

Mark: [Reading aloud from student's paper] "When I make cookies I sometimes have a problem." That fits in. Well, that's OK because it tells how he needs help. And "We eat our cake before dinner." That doesn't haven't anything to do with "There are many steps you must follow to make cookies." That should come out.

Interviewer: Is the story OK now?

Mark: Well, he could include those [changes] but he has wrong spelling in a lot of these [sentences] and he'd have to add a lot more.

Interview: Like what?

Mark: Like how to make cookies. First he'd say, he would have to tell you what kind of cookies he's telling you to make, and then he could add this...[indicates that he would have to tell about cookies before the paragraph that tells about asking his brother for help]. I mean, he'd have to write about where he has trouble.

Mark's reflections showed greater sophistication about writing to communicate. He also showed an understanding of different text structures and the role they play in determining the meaning in text being read. Unlike initial remarks, his concern about conventions of print is meaning related. Thus, from the language he uses, we can see growth in his ability to analyze text, a fundamental skill for writing and comprehending expository text.

What emerges from examining the writing, recalls, and interviews of these four students is their developing sense of themselves as informants, their ability to sustain their thinking about topics of their own choosing, their consideration of the audience who they plan to have read their paper, their ability to evaluate the quality of text on the basis of *meaning* rather than form, and their developing language about the writing and reading processes.

Implications for Instruction

The CSIW program provides opportunities for teachers and students to develop a knowledge base fundamental to writing and reading informational text. Students not only learn a language and vocabulary with which they can talk about writing and reading, they have multiple opportunities to use this language as they listen to and discuss ideas with their teacher, as they engage in peer-editing and peer-sharing groups, and as they work to internalize the strategies and language they have learned. In this sense, students come to understand that reading and writing are active partners in constructing meaning.

Throughout this instructional process, teacher modeling and think sheets provide support. The think sheets (a) help teachers make decisions about what to model and think aloud, (b) provide a representation of strategy use across reading and writing, and (c) lead to independent and effective strategy use. However, a note of caution is required: If used as traditional worksheets, handed out to be completed and then evaluated by the teacher, think sheets can encourage *more* worksheet question-answer activities and even *less* composing and thinking about text. Instead, teachers should prepare their own think sheets, individualizing them according to their own preferences, the types of texts the students are creating, and the special needs of their stu-

dents. Finally, it is important to remember that CSIW is not *the* writing or reading program. It is a program designed to complement, enhance, and guide ongoing writing and reading instruction.

One of our participating teachers captured the benefits of CSIW when she stated: "I feel a lot more confident. I feel like I'm really accomplishing something. I'll feel a lot more comfortable next year—a lot more defined. I was doing an awful lot of editing and an awful lot of me was ending up in their writing because I would ask the question and, you know, it was too much me and not enough them."

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Profile:
Byrd Baylor

Bette Bosma

"I am a writer," says Byrd Baylor, a southwest Arizona author, "and each morning, as I go out my door with my backpack I read the sign that I wrote to myself and tacked on the door.

All the other writers are sitting at their desks.
Where are you going?"

Walking in the desert is essential for her writing, Byrd relates. "I don't have to go anywhere to find out about things. It's all right here. I pick up stuff like bits of prehistoric pottery, pretty stones. I do things that are fun like following the tracks of a coyote or maybe a packrat. I'm

writing more and more about desert animals. so I write things in my notebook about what I see." Byrd Baylor feels that living close to animals is one way of keeping in touch with natural forces. She is happy living in the desert, and being part of it. "I have a fondness for a kind of country that is rough and wild and hard to get along with, so that it takes strength to make it there. I like the animals that live there."

With the help of friends, Byrd has built her own adobe house, on her property less than ten miles from the Mexican border. "It was really fun to mix clay and straw, and slowly build up the earthen walls. It's beautiful because it is made from earth." It even has an earthen floor which she cools in the summer by wetting it down—"nature's air conditioning." she explains. Because the walls went up slowly, she was able to place the windows right where they would make the best frames for the clouds and the mountains.

In the middle of this house she has a tree. Why a tree? "I always wanted a tree in my house. I have to see the sun come up every morning so that I can start my day the right way. I built a loft high enough so that I can see the sun come up over the mountains." She really wanted a live tree, but had to settle for a dead black

walnut. A friend notched steps with a hatchet. Now, whenever Byrd is home, she can start the day by walking up the tree to view the sunrise.

Byrd was born in San Antonio, Texas and her fondest memories are of visits to a family ranch in west Texas. Her father worked in small gold mines in the southwest area, and they moved frequently. She counted west Texas, Sonora, New Mexico, and Tucson, Arizona as home, before she found her special place in the southwestern Arizona desert. "You live where your heart tells you to be. For me, that is the desert."

Children often ask Byrd Baylor if she is an Indian, perhaps because of her obvious kinship with the environment. "Even the Indians ask that. Whatever tribe I am with, they place me in another tribe." My impression while talking with her was that she is pleased that the Indians think of her as one of them. She admires their respect for the environment and their ability to adapt to the harsh land and climate. Byrd lives in harmony with her environment and sees the uniqueness and beauty of each element of nature that she observes. She shares these observations in her books.

"I started writing in the third grade. I made up my mind then to be a writer, but I didn't tell anybody. I just told myself." Byrd kept her writing in a cigar box, cutting paper to fit, and adding story after story. She didn't think about illustrations for the stories, because all the pictures were in her head. Now, she marvels at the way Peter Parnall shares her

impressions of the desert and is able to capture the feeling of her books through his bold lines and brilliant colors. As a result of this successful collaboration, three books have been named Caldecott Honor books and four books have received ALA notable book awards.

Parnall has illustrated nine of her books, including the latest one published in 1986, *I'm In Charge of Celebrations*. When she saw the illustrations for the first time in the finished copy, she was delighted with them. She felt that he had understood exactly what her feelings were in choosing those particular celebrations. "I have one hundred and eight celebrations," Byrd reported. "All my celebrations are private things. The feeling is meant to be that you can celebrate anything you want to celebrate. They are private and don't have to appear to anybody except you. I celebrate things like coyote day, green cloud day, or dust devil day."

When Byrd begins writing a book, she does not think about anyone reading it, or what age of person would be interested in it. When she was young, Byrd thought that if she lived in a more exciting place like Europe she would be able to write more exciting stories. Now she thinks that whatever she does in her life is exciting. "If I want to write about a rock, a coyote, or a lizard—that's wonderful. I write about all the things that I truly love myself. The only thing I plan for sure in a book is the feeling that I want the book to have."

After she has collected all the

notes and observations she needs and is ready to stay at her desk to write, she says that finding the right words is the hardest part. "When I finish a book, it probably has about ten words that I just love—the rest of them just hold those words together." She writes her books in poetic form with the words carefully chosen for each line. The visual effect forms a unity with the illustrations and portrays the mood which she sets in her story.

Her first book was about a prairie dog town, and was titled *Amigo*. It was published by Macmillan in 1963, and in 1986 is being published in Japan with the original drawings by Garth Williams. Byrd recalls that this book was a result of a summer when she was trying to learn how to make tortillas. "My tortillas were awful. Everyday, I would try again, and no one would eat them, so my son and I would tear them up and take them out to the prairie dog town. The prairie dogs loved them. One day we went out there and right on this rock there were beautiful bluejay feathers. We knew the prairie dogs put them there as a present for us. Later they left beautiful little stones. The book came from that experience. Finally, after sending the book out to many, many publishers, I received a letter saying that they loved my book and were going to publish it even though they didn't know what prairie dogs were."

Byrd can tell a unique story about each book she has written. *I Am a Hunter of Fossils* was written on the fossil hunting site. "I love fossils." Byrd "I love things that take

me back to the beginning of life. I like to feel that I'm in a chain of life. I go around touching trees and fossils and pick up pottery pieces in the desert and think about the hands that held them before I did." But when she came to the middle of the book, she felt that she was doing a terrible job, so she packed up the fossils, got in the car and went back to west Texas where she did her fossil hunting. She sat on a rock at the actual site and finished the book.

The Best Town in the World was the result of hearing her father telling over and over how perfect was the town in which he grew up. The people were nicer, the houses were made better, and there were such wonderful cooks! This story appeared first in *McCall's* magazine, and Byrd received many letters from older people who were sure that they could identify the town. Byrd shared *The Best Town in the World* with children in a writing workshop in an elementary school. She told them some of the things she left out of the book, and they scattered to write their own ideas about a best town. Then all the authors shared their stories, and talked about the importance of their surroundings.

Byrd Baylor has worked with school children from Anchorage, Alaska to Midland, Michigan. "Many schools are bringing people in to talk about writing. I think it's more than just seeing a person who writes books; it's turning kids on to ideas. I see my work with children as encouragement to help them realize that they, too, have ideas and that's all they need to write. There is a

clear difference between writing as a creative endeavor and writing on an assigned topic. We should know what the difference is, and be in touch with what the children do."

Byrd feels that children should have time to look around them and see the important things. "I hope when children read my books that their eyes are a little more open to the world around them. It's so wonderful. That's not the reason I write, but I do hope that comes from my writing."

Books by Byrd Baylor:

And It is Still That Way. N.Y.: Chas. Scribner Sons, 1976.

Before You Came This Way. Illus. by Tom Bahti. N.Y.: Dutton, 1969.

The Best Town in The World. Illus. by Ron Himmler. N.Y.: Chas. Scribner Sons, 1983.

Coyote Cry. Illus. by Symeon Shimin. N.Y.: Lothrop, Lee & Shepard Co., 1972.

The Desert is Theirs. Illus. by Peter Parnall. N.Y.: Chas. Scribner Sons, 1975. New York: Atheneum, 1975. Caldecott Honor Book. ALA Notable Book. NY Academy of Science Honor Book.

Desert Voices. Illus. by Peter Parnall. N.Y.: Chas. Scribner Sons, 1981.

Everybody Needs a Rock. Illus. by Peter Parnall. N.Y.: Chas. Scribner Sons, 1974. New York: Atheneum, 1985. ALA Notable Book.

A God on Every Mountain Top. Illus. by Carol Brown. N.Y.: Chas. Scribner Sons, 1981.

Guess Who My Favorite Person Is. Illus. by Robert Parker. N.Y.: Chas. Scribner Sons, 1977. New York: Atheneum, 1985.

Hawk, I'm Your Brother. Illus. by Peter Parnall. N.Y.: Chas. Scribner Sons, 1976. Caldecott Honor Book. ALA Notable Book.

I'm In Charge of Celebrations. Illus. by Peter Parnall. 1986.

If You Are a Hunter of Fossils. Illus. by Peter Parnall. N.Y.: Atheneum, 1984. N.Y.: Chas. Scribner Sons. 1980. Outstanding Science Trade Book.

Moon Song. Illus. by Ron Himmer. N.Y.: Chas. Scribner Sons, 1982. Notable Children's Trade Book in the Field of Social Studies.

The Other Way to Listen. Illus. by Peter Parnall. N.Y. Chas. Scribner Sons, 1978.

The Way to Start a Day. Illus. by Peter Parnall. N.Y.: Chas. Scribner Sons, 1978. Caldecott Honor Book. ALA Notable Book.

When Clay Sings. Illus. by Tom Bahti. N.Y.: Chas. Scribner Sons, 1972.

Your Own Best Secret Place. Illus. by Peter Parnall. N.Y.: Chas. Scribner Sons, 1979.

Bette Bosma teaches at Calvin College in Grand Rapids, Michigan.

GETTING STUDENTS INVOLVED
IN PROBLEM DEVELOPMENT

Problems **without** numbers

> Bon Jovi's latest release is available in both cassette tape and LP.
> How much could I save by buying the album rather than the cassette?

Questions:

Which costs more?
What would you need to know to solve this problem?
How would you solve the problem?

Activities:

Students put in their own prices
and solve the problem.

Extend the problem by adding
information such as, "I have a
$20 bill..." or "Why do prices
vary by label and artist?

Problems **without** questions

> Beverly and Sheila go to the store. Beverly has $5.80 and
> lucky Sheila has $6.20. Their intent is to buy a frisbee that
> costs $9.20.

Questions students might generate:

Do the two have enough money?
If Sheila uses all her money, how much will Beverly pay?
What if Beverly uses all her money?
If each pays the same amount, how much would each pay?
Could they buy two frisbees?
How much more money would they need to buy two?

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GETTING STUDENTS INVOLVED
IN PROBLEM DEVELOPMENT

Given a picture or chart

SCOREBOARD

HOME	VISITORS
53	38

QUARTER	TIME
4	1:45
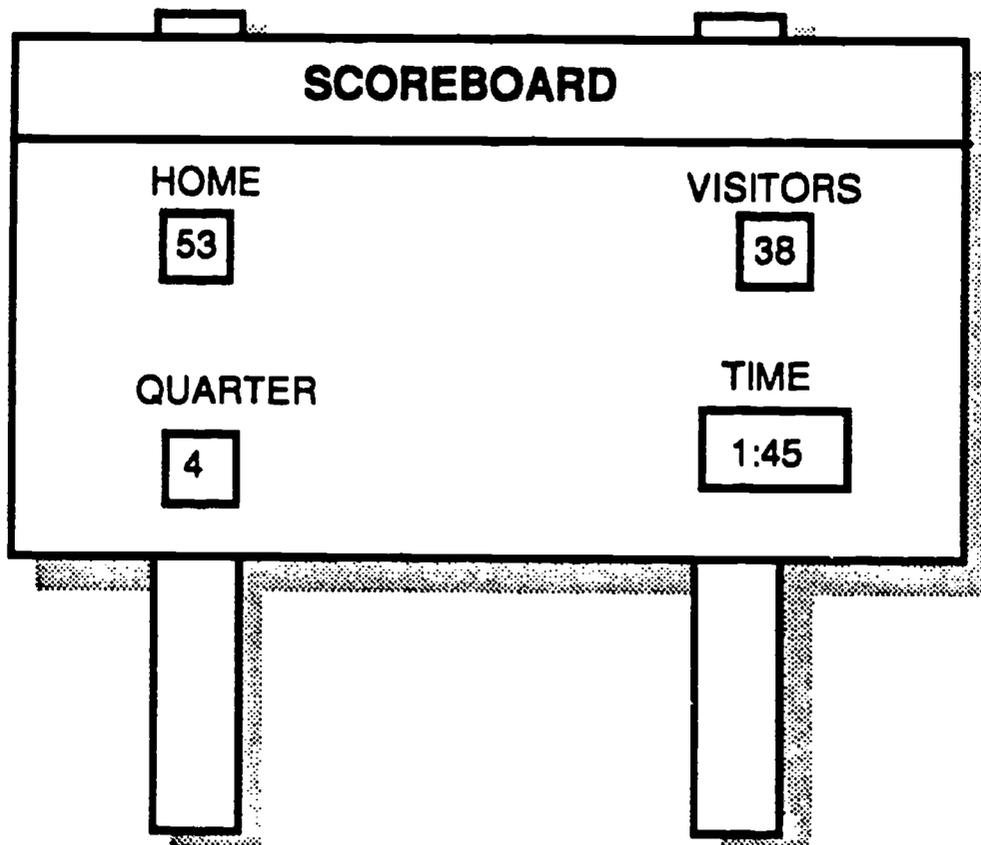
Questions students might formulate:

Is the game over?
How many total points were scored?
If a quarter is 8 minutes long, how many minutes
have been played in the game so far?

Adapted from: *"Problem Solving in School Mathematics,"* **NCTM 1980 Yearbook.**

PROBLEM SOLVING BACKGROUND

A Bit of History

Congress passed Title I of the Elementary and Secondary Education Act (ESEA) in 1965 to provide funding to state and local educational agencies to help meet the needs of educationally disadvantaged students. Since that time, legislation has revised, updated, and superseded the initial program, but the basic purpose of Chapter 1 of Title I of ESEA (1988) has remained the same. A majority of Chapter 1 assistance has been used by eligible schools to teach basic skills in reading and math with approximately 60% of Chapter 1 schools offering mathematics (National Assessment of Chapter 1, 1987).

Due to the long-held belief that students must learn "basic skills" before attempting problems requiring "more advanced skills," the traditional Chapter 1 classroom has focused heavily on "filling in the gaps" in student attainment of these basic skills. This focus has resulted in a heavy emphasis in Chapter 1 mathematics classrooms on repetition through drill and practice of the four basic arithmetic operations. These basic skills are important for students to learn, but many educators feel that this focus on computational facility has led to a lack of student understanding of the importance and relevance of mathematics in real-world applications. Furthermore, many students are unable to solve even simple problems requiring them to apply these skills. The National Council of Supervisors of Mathematics in its "Position Paper on Basic Mathematical Skills" (1977), made the following statement placing the important skill of problem solving at the center of mathematics:

> "Learning to solve problems is the principal reason for studying mathematics."

This view that problem solving should be the foundation of the mathematics curriculum was given additional impetus in 1980 by the National Council of Teachers of Mathematics (NCTM). In An Agenda for Action, NCTM recommended that problem solving be the focus of mathematics in the 1980s. Further, this document redefined basic skills (in terms of essential, not lower-order skills) to include more than computational facility:

> "Some groups narrowly limit them to routine computation at the expense of understanding, applications, and problem solving."

It further emphasized that the definition of what is basic must change with the times:

> "It is dangerous to assume that skills from one era will suffice for another. Skills are tools. Their importance rests in the needs of the times. Skills once considered essential become obsolete... . Necessary new skills arise... ."

The Risk--The Needed Changes

Others voiced a similar concern for student achievement in more advanced skills. The National Commission on Excellence in Education (A Nation at Risk, 1983) stated that America is at risk-- both in terms of competing in world markets and in terms of a citizenry that is capable of making informed, intelligent decisions. Furthermore, the Commission stated its concern that all citizens be able to make these decisions in the following statement:

> "Part of what is at risk is the promise first made on this continent: All, regardless of race or class or economic status, are entitled to a fair chance and to the tools for developing their individual powers of mind and spirit to the utmost. This promise means that all children by virtue of their own efforts, competently guided, can hope to attain the mature and informed judgement needed to secure gainful employment and to manage their own lives, thereby serving not only their own interests but the progress of society itse f.."

Those of us involved in Chapter 1 may see this statement as additional validation of the need and purpose for Chapter 1. Furthermore, the goal of education in the United States as seen by the Commission is in the same spirit as the overall goal of Chapter 1 programs:

> "Our goal must be to develop the talents of all to their fullest."

The need for improvements in mathematics education was again brought to light by the fourth mathematics assessment of the National Assessment of Education Progress (NAEP, 1986). One set of problems, labeled "Mathematical Methods," concentrated on assessing processes or procedures considered to be important to students' problem-solving abilities. Not surprisingly, students performed at their best on problems that involved everyday, simple, and familiar settings. When students were given extraneous information or problems requiring multiple steps, they had more difficulty. In light of the difficulties the "average" student demonstrated in solving problems, the additional burden of succeeding at these tasks faced by the disadvantaged student is evident. The National Assessment of Chapter 1 (1987) reported that some researchers found most Chapter 1 students were given "limited exposure to higher order academic skills" and some "argued that current approaches to compensatory education systematically underchallenge disadvantaged students and that continual drill and repetition of basic skills limits Chapter 1 students' opportunities to progress to more challenging material." However, the Whole School Day Study (1986) found that when Chapter 1 students were given the opportunity to engage in higher order tasks, they were able to succeed at them.

Changes in Chapter 1

The Chapter 1 Law of 1988 requires that students be given the opportunity to succeed at these higher order tasks. Further, the law addresses the concern of educators along with business and government leaders that all students develop their full potential in mathematics (and other areas) in order for them to become productive, thoughtful, and decisive adult citizens. The desired effects of Chapter 1 assistance-- to help students attain grade-level proficiency, succeed in the regular classroom, and improve achievement in basic and more advanced skills-- are necessary conditions for individual students to reach their personal best.

In the report, A Nation at Risk (1983), it was stated that "many 17-year-olds do not possess the 'higher order' intellectual skills we should expect of them." This document included recommendations for increased high school graduation requirements, including three years of mathematics but also pointed to the need for improvements in the first eight grades:

> "The curriculum in the crucial eight grades leading to the high school
> years should be specifically designed to provide a sound base for study
> in those and later years in such areas as English language development
> and writing, computational and problem-solving skills, science, social
> studies, foreign language, and the arts."

Once again, problem solving is stated as a much needed ability for students--all students. The Chapter 1 law concurs and encourages SEAs and LEAs to "develop programs to assist eligible children to improve their achievement in basic and more advanced skills." The term "more advanced skills" is defined as

> "skills including reasoning, analysis, interpretation, problem solving,
> and decision making as they relate to the particular subjects in which
> instruction is provided... ."

Therefore, for Chapter 1 students, mathematics problem solving is one of the more advanced skills that instruction should include.

Standards with Care

In his paper entitled, "New Schools for the Disadvantaged" (1987), Henry Levin called for reforms in programs for the disadvantaged but warned that "any strategy for improving the educational plight of the disadvantaged must begin at the elementary level and must be dedicated to preparing children for doing high quality work in secondary school. Simply raising standards at the secondary level

without making it possible for the disadvantaged to meet the new standards is more likely to increase their dropping out." Although the need for improvements in mathematics education has resulted in the call for new and higher standards such as those found in NCTM's Curriculum and Evaluation Standards for School Mathematics (1989), Levin makes a crucial point:

> "Reforms for the disadvantaged must address their needs directly, rather than assuming that a rise in general standards will automatically solve the needs of all students."

With this caution in mind, we must meet the need for teaching problem solving and other more advanced skills to Chapter 1 students, without simply setting standards that cannot be met, causing more frustration and failure on the part of students. The types of activities teachers select and the atmosphere in which these tasks are carried out are crucial to the successful problem-solving experience for Chapter 1 students. Whether or not students develop a useful "problem-solving attitude" (Mathematics Teacher, Dec., 1989) will depend a great deal on these factors. In Standard 6 of the Evaluation Standards, it is suggested that teachers assess students' "mathematical disposition." This is described as:

* Confidence in using mathematics as a tool to communicate, to reason, and to solve problems;

* Flexibility in exploring mathematical ideas and trying alternative methods in the solution of a problem;

* Willingness to persevere at a mathematical task;

* Interest, curiosity, and inventiveness regarding mathematics; and

* Tendency to monitor and reflect upon their own thinking and performance.

Along this same line, Chapter 1 programs are now required to evaluate student achievement in both basic and more advanced skills (Sec. 1019 (a) (1)); among advanced skills, problem solving is always included.

When asked to define problem solving, most people think of the story or word problems they were asked to solve in school. Although solving these problems constitutes a significant amount of classroom effort and time and are a necessary part of classroom mathematics, they are only a small portion of the types of problems in which students need experience. In addition, many of these problems are ~~lonlenpsdbindsinsdugfolkowingvdefinifidefofisonathMoaticahpoublensed~~ definitions contain the

"For any student, a mathematical problem is a task

    (a) in which the students is interested and
       engaged and for which he wishes to obtain
       a resolution, and

    (b) for which the student does not have a
       readily accessible mathematical means
       by which to achieve that resolution.

(Schoenfeld, "Teaching Mathematical Thinking and Problem Solving, ASCD 1989 Yearbook) The two critical elements in this definition are that the student cares enough about the problem to want to solve it, i.e., the student "takes ownership" of the problem, and that the solution is not immediately obvious to the student. This second part is extremely important for teachers to keep in mind when choosing problems for their students. What constitutes a problem for one student or class may be routine and not a problem at all for another. A simple example of this is the following "problem":

Steven collected bottles with his friends, Jim, Leslie, and Kevin. He returned the bottles to the grocery store and received $6.00. How much money should he give to each of his friends (and keep for himself), if they are going to share the money equally? (By the way, how many bottles did they collect?)

For some students, this would be a problem requiring them to use some type of strategy, perhaps acting it out using play money and dividing the six dollars equally among four classmates. For other students, this is not a real problem at all--it's a simple matter of dividing $6.00 by 4.

For the purpose of the workshop, we considered that most textbook problems are usually routine, actually exercises, often requiring the direct application of a single operation or algorithm that has just been studied. These problems help students see the relationship of mathematics to real-world applications, often improving recall of basic facts and reinforcing algorithmic skills (NCTM 1980 Yearbook, p. 105). Instruction should include, but not be limited to, textbook-type problems. Process problems--often problems with more than one step, extraneous information, and even problems without numbers--will encourage students to develop strategies that they can use again and again. Process problems are taught in order to stress the method or process of solving the problem rather than the solution itself, and to encourage students to develop and experiment with various strategies.

Although deciding whether a problem is or is not a "real" problem depends upon who is trying to solve it, we can divide them into two general categories--textbook-type problems (routine exercises) and process problems (non-routine). Some problems are non-routine for just about everyone (like the last example), but teachers must decide what is appropriate for their own students when teaching problem solving as a more advanced skill.

Problem Solving--Everyone's Doing It?

Now that we know there are problems...and then there are problems, it is appropriate to look at what problem solving actually entails. One definition of problem solving follows:

> Problem solving is the process by which the student resolves an unfamiliar situation or non-routine problem.

The word "process" is important in this definition. In his most famous book, How to Solve It (1946), George Polya, sometimes referred to as the "father of problem solving," gave a four-step heuristic (or strategy) for problem solving:

1. Understand the problem.

2. Develop a plan.

3. Carry out the plan.

4. Reflect on one's work.

This heuristic (or some variation of it over the years) has been used because it contains the desired and necessary steps for solving problems. Although this process sounds simple enough, it is obvious that developing a plan causes the most difficulty for students. However, each component is important and so is considered separately.

<u>Understand the Problem</u>   Before any problem can be solved, it must be recognized by the student as being a problem. Once this has occurred, the student must thoroughly understand the problem. There may be many obstacles to this understanding, including such things as a lack of personal experience with the topic and language barriers. If a student "gets stuck" in this phase, it is impossible to go any further. Sometimes, the "ah-ha" that indicates the student knows what the problem is asking is a minor breakthrough in itself.

<u>Develop a Plan</u>   Once the problem is acknowledged and understood, then a student must begin to make decisions about how to solve it. This is the most crucial and difficult component, the phase where many students give up. To avoid having students give up too quickly, the first few non-routine problems must be chosen carefully. When students are initially introduced to problem solving, it is especially important that they be given problems that generate a "can do" feeling without being so simple that they are not real problems. In her article, "Problem Solving, an Attitude as well as a Strategy," Schmalz makes a point that will be helpful to those teaching problem solving (1989):

> "It is important that we discuss with them that our attitude
> toward our work is just as important as the strategies we use
> in our work."

Students also need to be given the opportunity to explore and develop various strategies for solving problems. The strategies may include drawing a picture, making an organized list, acting out the problem, making a graph or chart, using logical reasoning, guessing and checking, solving a simpler case, and others. However, we must be careful how these strategies are taught to and discussed with students. Schmalz also makes a good point on this issue:

> "When we teach problem-solving strategies to students, we
> must be cautious that we do not give them the impression that
> problem solving is a bag of tricks that we apply at the right
> time and place."

It is evident that both a student's knowledge and attitude are important to becoming a successful problem solver. Students need to believe the problem can be solved, that they can solve it, and be willing to persevere in solving it. They also need to have opportunities to develop and try various strategies for solving problems.

<u>Carry Out the Plan</u>   Once a student has persevered to the point of understanding the problem and developing a plan, then the plan must he carried out. Often, in textbook or routine problems, this phase is a matter of performing some simple numerical operation or solving an equation. However, in non-routine problems or process problems, the student is often required to do a great deal more thinking as the plan is carried out. For example, look at the following problem:

> If a jar is 1/4 full of a bacteria which doubles in size every minute, then how long will it take before the jar is full?   .

Suppose you decide to draw successive pictures to solve the problem--one for every minute until the jar is full--then you have decided on a plan but still have some thinking to do. This phase should not be considered trivial, nor should the computational portion, if any, be overemphasized. Solving good problems can require lots of time, and students should not be rushed through it. Additionally, too much emphasis on the computations can give students a skewed view of problem solving.

<u>Reflect on One's Work</u>   At first glance, this final phase seems insignificant, but reflecting can actually be the most important component. This phase includes checking to see that the problem has been solved--that the right question has really been answered--and looking for the possible mistakes in the solution--computational mistakes, errors of logic, or mistaken assumptions. If a problem has not been solved correctly, then returning to the beginning and making sure the problem is understood, developing a new plan, etc., will need to be repeated. This is also the point at which the problem may be extended, generalized, or otherwise altered for additional exploration. The "What if...?" and "Can you predict...?" questions usually occur at this time. Using the previous example, the student may explore the extension question, "How many jars will be filled in an hour?"

It has been said that the knowledge of mathematics can be divided into several parts, two of which are (1) information and facts and (2) the ability to use information and facts. This ability to use information and facts is an essential part of the problem-solving process. Problem solving requires analysis and synthesis. To succeed in problem solving is to learn how to learn. Experiences in problem solving are always at hand. All other activities should be subservient. Thus the teaching of problem solving should occur in every class period. Discussion of problems, proposed solutions, methods of attacking problems, etc., should be considered at all times. There will, of course, be times when studies of algorithmic skills and drill and practice sessions will be called for. These times permit the delay necessary for the incubation period required by many problems. By allowing time between problem-solving sessions, students are permitted to become familiar with the problem-solving process slowly, and over a longer period of time. The number of problems discussed in any one class session must, of necessity, be small. This is a natural outgrowth of the process of problem solving. The goals are a stuay of the problem-solving process and growth in using the process, rather than merely "covering the material" (Rudnick, et al., 1987).

Teachers Make the Difference

What are Good Problems?

Before jumping into problem solving, teachers must be careful to develop or select problems that are appropriate for their students. If students have no experience in solving process problems, they may need to be given extra assistance and direction. Problems that are not readily solved by using a single operation or a recently studied algorithm may cause student anxiety but may also stimulate and foster a more creative and explorative environment. The following suggestions from the booklet, <u>How to Choose and Create Good Problems for Primary Children</u> (NCTM, 1983) are appropriate for most school children:

1. The problem should be of significance mathematically.

2. The situation in which the problem occurs should involve real objects or obvious simulations of real objects.

3. The problem situation should capture the interest of the child.

4. The problem should require the child to move, transform, or modify the materials.

5. The problem should offer opportunities for different levels of solution.

6. The problem situation should have many physical embodiments. (It should be possible to create other problem situations with the same mathematical structure.)

7. Children should be convinced that they can solve the problem, and they should know when they have a solution for it.

Although standard textbook problems may be solved using a single operation or by applying some algorithm, process problems require the use of one or more strategies. Even when a problem can be solved using an algorithm, younger students do not always have the algorithm available to them--transforming the seemingly simple question into a more difficult process problem for students of that age and ability.

Helping Students Become Good Problem Solvers

Over the years, educators have searched for the important characteristics of good problem solvers. Students with relatively high IQ scores and reasoning ability, along with high reading comprehension and computation scores tend to be successful problem solvers. The following list of additional characteristics of good problem solvers should encourage Chapter 1 teachers, since their students either have or are capable of developing many of these characteristics (NCTM, 1980 Yearbook, p. 36):

- The ability to understand mathematical concepts and terms;

- The ability to note likenesses, differences, and analogies;

- The ability to identify critical elements and to select correct procedures and data;

- The ability to note irrelevant detail;

- The ability to estimate and analyze;

- The ability to visualize and interpret quantitative or spatial facts and relationships;

- The ability to generalize on the basis of a few examples;

- The ability to switch methods readily;

- Higher scores for self-esteem and confidence, with good relationships with other children; and

- Lower scores for test anxiety.

Teachers can create and choose classroom activities that foster a classroom atmosphere helpful to student development of these characteristics. So, in addition to developing a classroom list of problem-solving strategies and modeling the use of Polya's 4-step heuristic, teachers can plan classroom activities that encourage students to discuss likenesses and differences, estimate answers--even guessing initially; visualize problem situations; draw pictures, generalize and find patterns--including number and shape--and try a variety of methods for solving the same problem. All of these activities need to include appropriate praise to help students develop confidence. When students find that they can be successful problem solvers, their self-esteem rises, and their anxiety level decreases.

Summary

Clearly, instruction in problem solving is a necessary but not sufficient condition for producing better problem solvers. Helping students develop an understanding of the process of problem solving, teaching them a repertoire of strategies, and providing a variety of problems to solve are essentials for improving students' problem-solving abilities. By increasing our understanding of this complex process, research will continue to provide clues that indicate how problem-solving instruction can be improved in classrooms at all levels.

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What's Whole about Whole Language?

Picture this: Scenes from a Whole Language Classroom

"What's Whole

about Whole
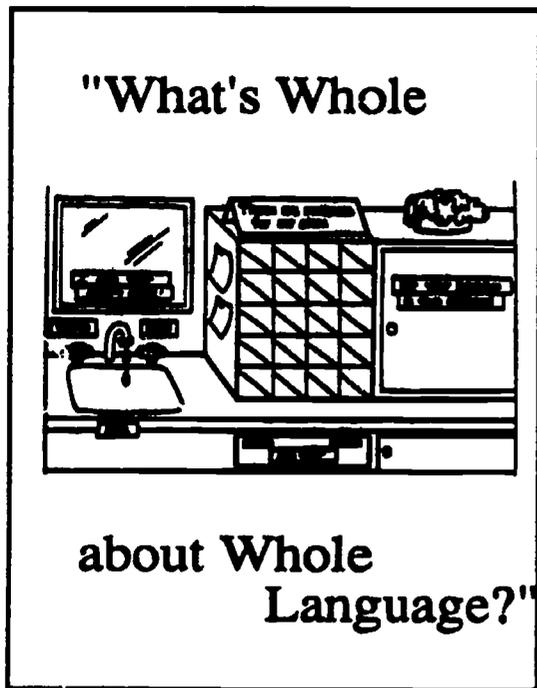
Language?"

Introduce this review of "Whole Language" by discussing the fact that it is not a *method* of teaching reading and writing, but rather a *philosophy* or *approach*. It is a different way of thinking about and planning instruction and the classroom environment. To convey this message, read the following scenarios drawn from teachers' descriptions of language behavior in theirclassrooms (Taylor, 1989).

Scene 1: Kindergarten classroom (Mark)

Mark knows many alphabet letters and corresponding sounds and is beginning to use this knowledge to label his pictures with critical features of the needed word: "SR" for

REFER TO TRANSPARENCY

spiderweb...Mark continues to describe his pictures in great detail orally. Sometimes he notes every single thing he has drawn: "This is Mickey Mouse watching Pluto in the shade beside the doghouse under the tree on the nice grass. And Mickey's standing on his front porch. And that's his house with his windows, his basement, his stairway, and his front porch."...His own writing varies from none to the initials "USA" on a truck, to a single word ("VOOKANOO"--"volcano"), to several words ("SKAEHS KAD" --"sky house cloud") or a complete sentence("DSAPNGOTORC" --"This is

REFER TO TRANSPARENCY

a person going to work"). Mark prefers to write words he knows from memory, such as "Mickey Mouse." He also integrates print into his art work; in addition to USA on a truck, he made a sign which said, "Mark," and he told me, "It says, 'Mark's town, next stop!'"

When he reads his own writing, he pays attention to the letters he has used. One day, I asked him to read "TKK" at the top of his paper. He started to read, "Tiger Sh...," but then he grabbed a pencil to add "AK" at the end to complete it: "TKK AK" --"Tiger Shark.."

📷 Picture this:

Scenes from a classroom

"SR"

"DSAPNGOTORC"

Mark

"Jill has worked some time on her story, "Hidden Crown," an adventure tale for which she has created many detailed illustrations to carry the action of the narrative."

Jill

1
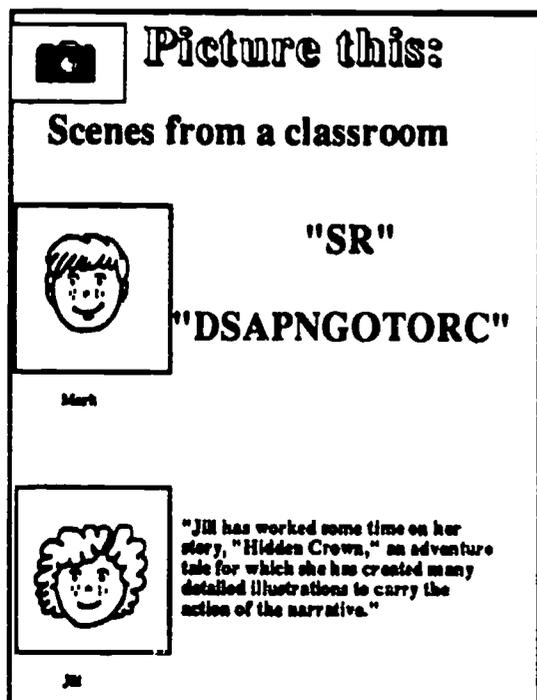
Scene 2: Third Grade (Jill)

"I don't know what's different,' Jill told me one day. "Last year I thought reading was, you know, just okay. But this year I love reading! It's my best thing!" Jill's enthusiasm for reading also appears in her reading journal: "I feel like I read a million pages. It is a wonderful book." ...The few entries that Jill has written in her reading journal are either brief descriptions of the story she has read or simple, evaluative comments: "I really like Little House on the Priarie. I think it is comfortable."

Jill has worked for some time on her story, "Hidden Crown," an adventure tale which bears some resemblance to the "Choose-Your-Own-Adventure" books that she often seeks in the school's library. Jill spends an extensive amount of time creating detailed illustrations to carry the action of her narrative.

For most of this month, Jill has been reading Chester Cricket's Pigeon Ride, which in her reading journal she describes as being "good in one way and good in another way." The reading journal entries that she wrote were one-or two-sentence descriptions of the main idea behind what she read.

Jill is able to adjust her writing to her audience and to the purpose that her writing serves. Her reading journal letters to me are chatty accounts of her feelings about reading, questions to me as a reader ("What book are you reading?"), or reviews of the stories she reads.

Think about this:
Whole Language Philosophy

Think about this:

Whole Language Philosophy

- derived from observations of children's natural use of language

- literacy programs must build on existing learning and utilize textbooks and various

- reading and writing strategies are built during functional, meaningful, relevant language use

- there is no hierarchy of sub-skills

- teachers create an environment and invite learners to participate in and plan literacy events and learning opportunities

- materials for instruction must be whole texts that are meaningful and relevant

- risk-taking is essential

Mention that many of the details of the preceding scenarios reflect the philosophy of Whole Language: children using invented spelling, making choices about what they will read, keeping reading journals, reacting affectively to what they have read, communicating with the teacher about what they have read, and writing extensively in reaction to and in conjunction with things they have read.

In contrast to the typical classroom which begins with the premise that the teacher and curriculum are at the center of learning, in whole language classrooms, children and their needs are at the center. In a Whole Language classroom, teachers are often hard to spot. Rather than directing the class from the center of attention, whole language

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teachers usually participate with their students in organized reading and writing activities. If the children are writing and sharing their compositions, the whole language teacher is also writing and sharing his or her compositions with the children.

The traditional classroom evolved from a technology of reading instruction in which behavioral psychology strongly dominated, and narrow views of language and language learning were incorporated. In contrast, the Whole Language philosophy was derived from the observation of children learning language in natural ways, in the context of meaningful usage. As a result, there is no hierarchy of sub-skills, no pursuit of skill mastery. Learning to read and write happens naturally, informally, and through the process of discovery. The teacher's job is to create an environment that encourages the use of reading and writing to solve problems and in which language can continue to develop in meaningful, natural ways.

Focus on this:
Facts about Whole Language

A visit to a whole language classroom reveals noticeable contrasts in teacher behaviors. Whole language teachers encourage children's attempts to read and write through frequent praise, although these attempts are often only approximations of mature reading and writing behaviors. Conversely, teachers in traditional classrooms stress correctness over trying. Risk-taking is essential in the whole language classroom. Developing readers must be encouraged to predict and guess as they try to make sense of print. Developing writers must be encouraged to think about what they want to say, to explore genre, to invent spellings, and to experiment with punctuation. Learners need to appreciate that miscues, spelling inventions, and other imperfections are part of learning.

☑ **Focus on this:**

Facts about Whole Language Language

1. Children have choices

2. Teachers participate and facilitate.

3. Instruction is informal and discovery based.

4. Comprehension of meaning is always the goal.

5. Children are immersed in language.

3

Say this: Whole Language language

The flavor of the Whole Language movement is captured in much of the vocabulary or jargon which surrounds it. (Unfortunately, sometimes the use of the wrong terminology in conversation has a distancing effect for those who are the most zealous about their position.) Whole language advocates describe whole-language tasks and texts as **functional, natural, genuine, authentic.** In Whole Language, readers read to **construct** their own interpretation of texts written by authors whose genunie intent was to **communicate** with an audience for purposes of entertainment, information, or persuasion.

Whole language curriculum is **integrated** in the sense that it seeks to preserve the wholeness or integrity of literacy events; no literacy act is mercilessly and unnecessarily decomposed into subskills. All language acts are undertaken with genuine communicative intent. When this occurs, these activities are **authentic.**
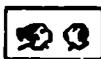
Check this: Assessment in Whole Language Classrooms

Whole language teachers become aware of student progress by **"Kid Watching"**--observing growth in students' repertoire of language activity while they complete authentic literacy tasks.

A **miscue analysis and retelling** procedure provides a profile of the quality of errors made during oral reading and the strategies students use as they read, as well as information regarding students' comprehension of text.

4

An "Emergent Reader Evaluation" designed for students who cannot independently read text and therefore cannot be evaluated with other procedures. Such an instrument examines knowledge of literature, book handling, and letters. It also allows teachers to observe students' retelling of text read to them, story dictation, and reading of dictated text.

A writing sample, administered at all grade levels, that provides information regarding the quality of the students' writing, the process by which students compose, and some quantitative product measures such as number of words written and words correctly spelled.

Student interviews that tap children's metacognitive knowledge of reading and writing as well as their attitudes toward reading and writing.
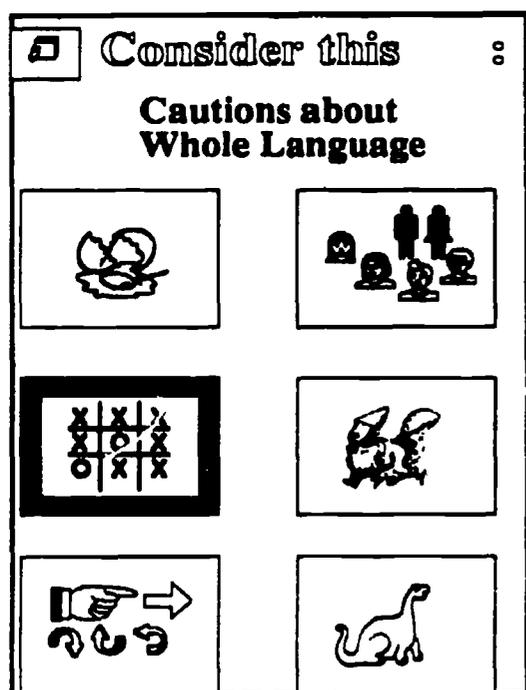
Consider this: Cautions about Whole Language

The following points should be discussed as cautions to take into consideration before launching into a Whole Language approach.

- A thorough understanding of the Whole Language philosophy is important before teachers try to implement strategies reflecting this philosophy. There is considerable risk of "doing it badly" and thereby confusing children and delivering instruction that is counter-productive.

- "Leading from behind" is a common phrase in Whole Language parlance, but keeping the teacher so much in the background runs counter to recent research on active teaching--modeling and demonstrating the processes of learning.
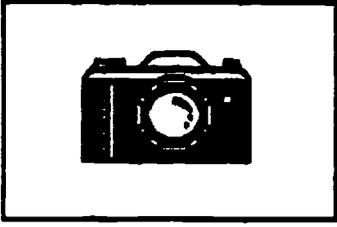
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- By valuing children's language and not presenting the language of a dominant culture, minority children may be deprived of learning the "power code".

- The insistence on including "real world" tasks in the classroom may reflect a romantic view of the world, a world that does not always encourage as much reading and writing as would be desirable.

- In some ways, the Whole Language movement values "signs" over "substance". Advocates often respond to anything that smacks of "classroom control, manipulation of the instructional environment, modeling, guided practice, time on task, skill, or error" with such knee-jerk, emotional reactions that one wonders if they are considering the substance of what is being discussed, if they are willing to find the common ground in what researchers and educators in general are recommending.

- Finally, Whole Language proponents recommend an "all or nothing" revolution in classroom instruction that does not take into account that people change most easily when they are allowed to adapt, revise, reformulate, consider--in short, it might seem that *evolution* rather than *revolution* is what is required.
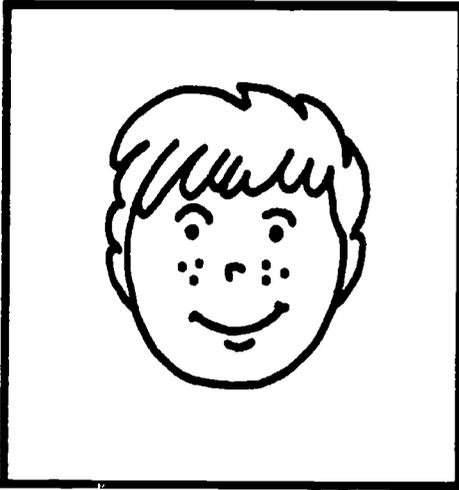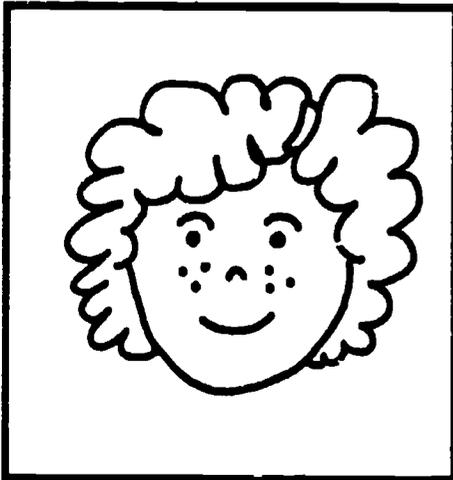
"What's Whole
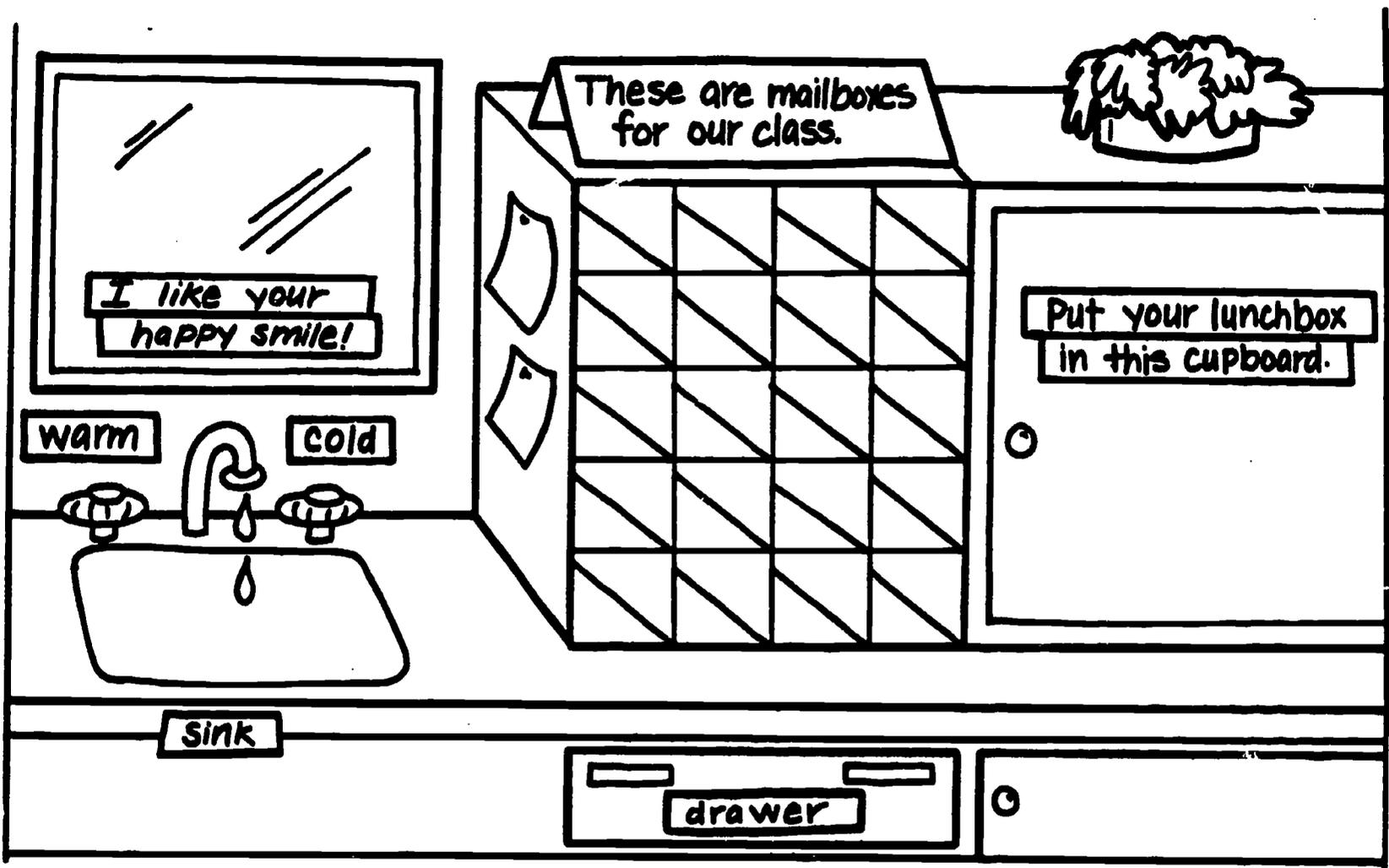
These are mailboxes for our class.

I like your happy smile!

warm cold

Put your lunchbox in this cupboard.

sink

drawer

about Whole

Language?"

Picture this:
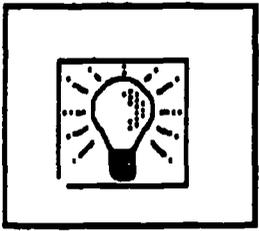
Scenes from a classroom

Mark

"SR"

"DSAPNGOTORC"

Jill

"Jill has worked some time on her story, "Hidden Crown," an adventure tale for which she has created many detailed illustrations to carry the action of the narrative."

Think about this:

Whole Language Philosophy

derived from observations of children's natural use of language

literacy program must build on existing learning and utilize intrinsic motivations

reading and writing strategies are built during functional, meaningful, relevant language use

there is no hierarchy of sub-skills

teachers create an environment and invite learners to participate in and plan literacy events and learning opportunities

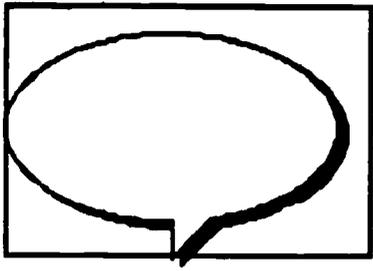materials for instruction must be whole texts that are meaningful and relvant

risk-taking is essential

# Focus on this:

Facts about Whole Language Language

1. Children have choices

2. Teachers participate and facilitate.

3. Instruction is informal and discovery based.

4. Comprehension of meaning is always the goal.

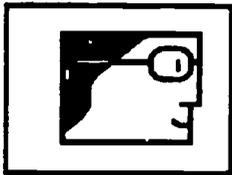5. Children are immersed in language.

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Say this:

Whole Language language

- **authentic**

- **natural & functional**

- **contextualized**

- **empowering**

- **integrated**

- **personal & social**

- **indivisible & holistic**
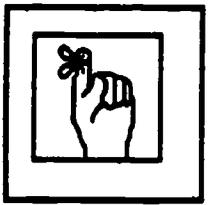
Check this:

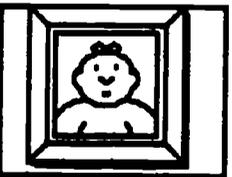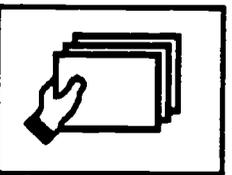## Assessment in Whole Language Classrooms

Kid-watching

Self-evaluation

Miscue Analysis & Retelling

Emergent reader Evaluation

Writing Samples

Student Interviews

THE COMPREHENSION-CENTERED CLASSROOM
Setting It Up and Making It Work

Vera Milz

As I moved into room 14 at Way School in September 1976, I faced four walls, assorted tables, bookcases, and a movable storage unit on a partially carpeted floor. I began immediately to evaluate my new surroundings, and to design an environment which would enable twenty-eight first and second graders to interact and communicate. Following is a description of the classroom environment and the program which was developed.

Room Arrangement

Children learning language would be the focus of my program, and I wanted to provide many places and opportunities for them to experience and use language. I settled upon the room arrangement shown in the following diagram. However, this arrangement is subject to change as materials are removed or as new things are added to accommodate changes in my program.
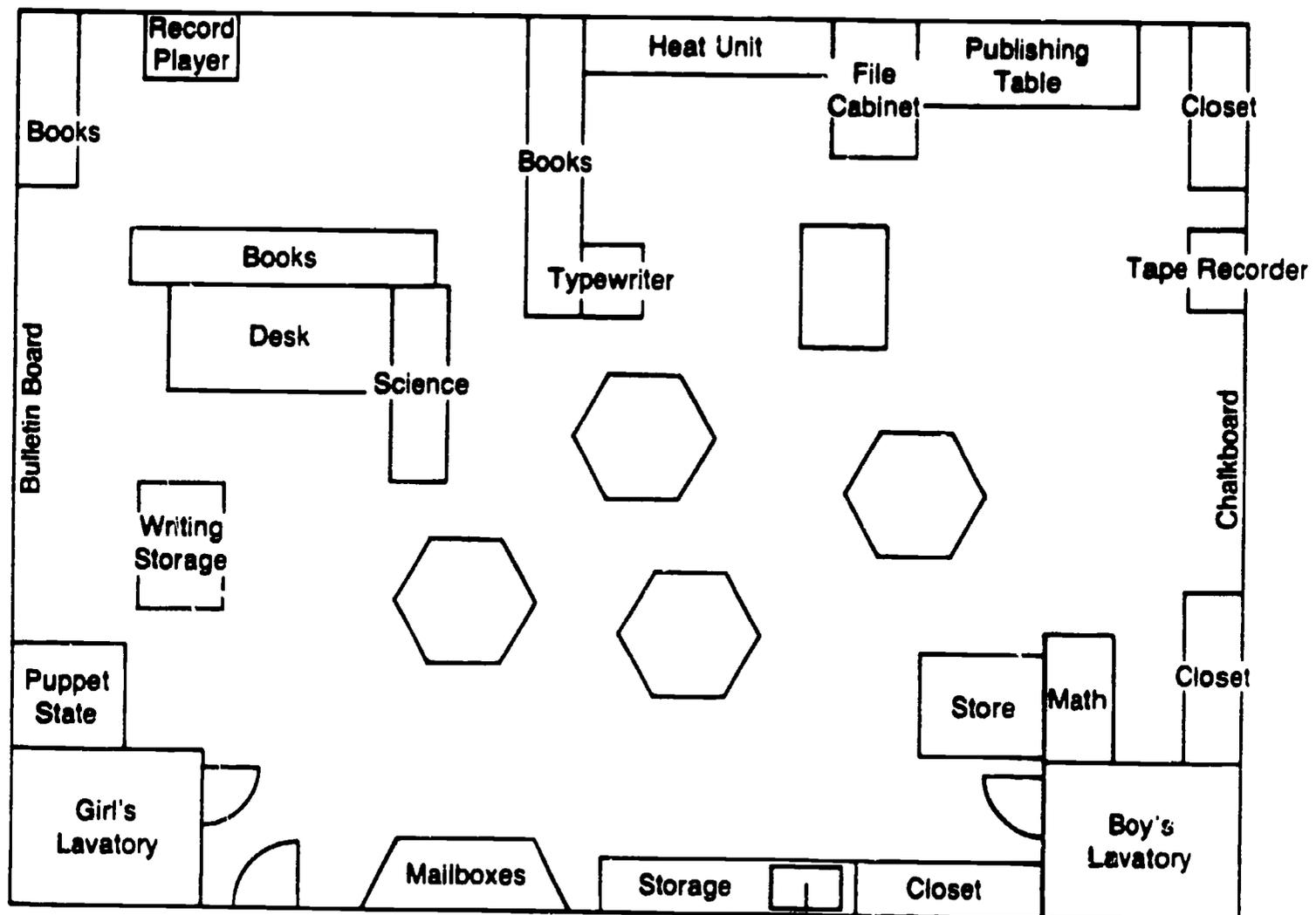

Figure 1

Regardless of the room you have, I feel the following elements are of importance:

Reading Corner:
A collection of books accumulated over the years. I have about 2000 books acquired from donations, paper-back book clubs, and my own purchases. These books are alphabetized by title, except for titles beginning with the words "A" or "The". A book like *Strega Nona* is put in S, *Apron On, Apron Off* is placed in A, but the *Seeing Stick* is placed in S. Even first graders can learn to use the books independently and replace them so others can find them. If the graphic letter in the title is hard to distinguish I use a permanent marker to write the letter on the upper left corner. The children need to learn to replace the books with the spine out to assist others to locate a book. I have a bookcase of assorted basal readers, and the tops of the bookcases hold children's magazines, such as *Ranger Rick* and *World*.

Writing Supply Area:
A storage place which will hold a variety of writing materials. I was fortunate to inherit a movable storage unit in which I keep:

Assorted types of paper
Markers, crayons, and colored pencils
Scotch tape
Stapler
Scissors
Blank Books
Print-set letters,

and a place to put completed books for others to read. Such a place can be seeded with books written by other children. I usually place a few books that children in previous classes have duplicated for me.

Mailboxes:
I glue together two or three two-quart milk cartons with dividers, and cover the whole unit with contact paper. Notes from me, and later from pen pals and from other children in the room are placed in the mailboxes.

Listening Areas:
In this area I have a tape recorder and record player with assorted books and matching tapes/records. Since I have a fairly high tolerance for sound, I do not use head-sets. As children notice others using these materials, they often go over themselves to try them.

Spaces:
Children need places where they can interact with each other. Tables or desks pushed together, as well as floors and corners need to come together to work and share ideas.

Content Area Places:
Shelves holding math manipulatives, science equipment, projects-in-progress, etc., allow children to get materials and continue on long-term projects.

Old Typewriter:
If you can talk someone out of an old typewriter, it will prove to be a valuable instrument for developing writing in the classroom.

Daily Schedule

My self-contained classroom has been described as having "a flow"—children are working on many projects yet moving independently from one to another. At any time that children are working independently, some will be reading, others will be writing, and still others will be using other materials. Each year, my schedule changes depending on classes like gym, music or art. My schedule for a typical year follows:

Using the above schedule to get an idea of the week, a fairly typical day is composed of:

Opening-Attendance, lunch count
Sharing Time
Planning the Day
Work Period
Recess
Story Time
Work Period
Lunch
Story Time
Work Period
Special Classes
Evaluation and Clean-up
Story Time

Although I use the title, "Work Period," the activities vary. At times, I call the whole class together to use movies, or filmstrips, as well as present other material. At other times, the children are working independently or in small groups.

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Period	Monday	Tuesday	Wednesday	Thursday	Friday
9:30-9:30					
9:30-10:30			Mrs. G.—Parent Helper	Art 9:15-10:15 Story Time	Mrs. K.—Parent Helper
10:30-11:00	Morning Recess				
11:00-11:50		Mrs. W.—Parent Helper			Math Lab.—Mrs. H.— & Mrs. C.—Parent Helpers
11:50-12:55	Lunch and Recess				
12:55-2:00					
2:00-2:30	Music	Music	Gym	Gym	Gym
2:30-3:35					
3:35-3:40	Dismissal				

Figure 2

Listening

Listening goes hand-in-hand with speaking. Just as children need to be able to talk, they need to be able to listen. Teachers also must listen! It is here that we begin to realize the background that children bring to the classroom. Caterpillars are common in the fall in Michigan, and several were brought to school. As we looked at them and talked about them, I realized that the children expected each to spin a cocoon and become a butterfly. Lots of discussion and checking of several books led the children to realize that not all caterpillars spin cocoons. At the same time, a monarch caterpillar changed into a chrysalis, and several weeks later a monarch butterfly emerged. When I read *The Very Hungry Caterpillar*, several children noted that the author didn't know that moths come out of cocoons—not butterflies.

In addition to gathering information from listening, children also hear the sounds of literature. As Dorrie comes down the stairs from the Big Witch's magic-making room, the children hear the down down, down of Dorrie's steps. I read to children daily—actually several times—as I want them to be surrounded by the sound of our language. Children can also listen to tape recordings and

records based on children's books. They love to play with the sounds they hear. Every child in my room can say the longest name in the world, "Tikki tikki tembo-no sa rembo-chari bari ruchi-pip peri pembo," as they listen to *Tikki Tikki Tembo*. Bill Martin's *Instant Readers* have accompanying tapes which can be listened to independently. Language Master cards with pictures and accompanying description allow children to read and listen to what their classmates wrote.

Reading

Reading is a solitary activity between a reader and the message written by a writer. Readers get meaning from the message as they use their knowledge of:

1. graphophonics (sound-print relationships)
2. syntax (grammar and structure of language)
3. semantics (perception of the word, meaning)

Reading takes place as readers use the above cues to understand the ideas the writer is trying to convey. The reader, representing diverse patterns in background and interests, reads signs, labels, messages, and books.

Children entering first grade are using oral language quite proficiently. To meet their reading needs, I begin with whole, real, relevant written language—not isolated words, sounds or letters. Print fills our classroom, from the calendar to the lunch menu to the books in the Reading Corner. Research has shown that children can read words in a meaningful context or story, which they were unable to read in isolation. Thus, I write notes which the children find in their mailboxes from the first day of school. A store is set up with many empty household boxes and cans donated from the children's homes. Toy street signs and a car provide play experiences, and children begin to read the signs as they "drive" the car. Classbooks can capitalize on this growing knowledge. For example, a book to which each child contributed a page was written after a tour of the building-inside and outside. This helped children realize there are many signs they could already read and understand. The words from signs were taken from a situational context and placed in a book context by using photographs of the actual signs in and around the building.

Methodology and Materials

Language development is the primary concern in my classroom. Inasmuch as I believe that language develops through use, (for example, I believe that we learn to read by reading) my goal is to provide opportunities for this to happen. Isolated exercises using fragments of language are often counter-productive and take time away from "whole language" activities, so I have tried to develop activities such as the following:

Speaking

By the time children enter my classroom they know how to talk. They have discovered how oral language works and are using it effectively. Many children also have developed an awareness of written language and print. There is much evidence of their increasing proficiency and continuing development taking place, as I hear Chris say, "I *buyed* my lunch today," or Dana ask, "Is it (gym) *Shimday?*" Both children are creating language, and if they are to develop further, they must be given the opportunity to talk in the classroom. Total silence dominates many classrooms; but I have found that children can

learn acceptable levels of sound which still allow others to concentrate on what they are doing.

If a child is learning English as a second language, opportunities to talk to other children and adults become especially critical. Francis is learning English in my classroom, and I often hear him trying out the sound of new words. The day that he first said my name, he must have repeated it fifty times as he realized he could get a response from me when he spoke it.

Children learn to expand their own command of language at the same time as they are using it with others in a shared setting. As a teacher, I believe my job is to provide opportunities for oral interchange—not to be a lecturer dominating the classroom. Too much lecturing, and asking questions which only a few students answer forces the majority of students into a passive role. Instead, I prefer to try to balance the day and find time to talk individually with the children—perhaps over a science table watching a monarch butterfly emerge. While developing a puppet play, while eating lunch, or while discussing a book together. In short, rather than discourage talk, the classroom must encourage and stimulate talk among its students and the teacher.

STOP
by Lynne

Stop signs are very important
If you see one you should stop
because what if a car is coming—
it will hit you!

To provide early reading experiences, I have found that the children quickly respond to repetitive, predictable patterned stories, such as *The Lion's Tail*, *The Missing Necklace*, and the *Three Little Pigs* which are found in the *Scott-Foresman Reading Systems* (1971). Children, also, respond to the natural language in the *Breakthrough to Literacy* books, and relate stories like *Our Baby* and *The Loose Tooth* to happenings in their own lives. As the children are getting started, I give them a list of the stories in the Level

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2 "Blue Books" in the *Scott Foresman Reading Systems*. They place an "x" beside the stories they read independently and I initial the ones that we share. Later, they begin to write the titles of other stories and books that they read in a "Reading Notebook."

Name: Jon
My Reading List
The Lion's Tail
Ten Little Bears xxx
The Bus Ride x
Head to Feet MM xx

As teachers we need to be aware of the reading strategies used by our children. The most productive way I have found to do this is to schedule conferences with children on a "needs basis." This gives me more flexibility than the typical reading group setting where at most I can hear one child read a few lines. In the conference, I can have a child read a whole story, or perhaps a favorite part. I can stop and discuss a point— perhaps adding information or even let a child figure out something without boring 8-10 other children while doing so. As an example of this, Malcolm was reading from *The Plant Sitter*. He read the portion where Tommy says that he is earning two cents a day for each plant. As Malcolm read the story, he looked at me after reading *two*. After a pause he skipped *cents* and read on to finish the page. Then he said, "I know he earned two pennies for each plant." He finished the story and began to talk about it—even commenting that maybe he could earn money that way. Finally, as he prepared to leave, he looked at me, and said, "You know, I just figured it out—he would get two cents a day." The reading conference allows children to "figure it out" by themselves, yet it gives me the opportunity to look at the way they are processing print while reading. It also allows children to choose from a range of books to suit their personal interests rather than being forced to use a single basal reader chosen by the teacher or the school board. I believe this freedom of choice contributes a great deal to the development of their reading tastes and habits.

In addition, my young readers ask many questions about written language in the classroom. Greg asked me why I had Shirley and Mandy written on the front bulletin board. I realized that, although he had not had specific instruction on letter-sound relationships, Greg was using graphophonic cues in an attempt to figure out what was written. I pointed out that the bulletin board had a calendar on it, and calendars have certain kinds of information on them. October was the month which he knew. As we looked further, he told me that calendars show days. Once he had that information, Shirley became Sunday, and Mandy became Monday, and Greg read the rest of the days of the week. As he used the calendar, and other materials, many times during the year, he was learning to read the information they provide. Reading will make sense to him and will not be just a slow, tedious act of sounding out words letter by letter. Reading is a useful and rewarding experience.

Writing

Of the four language processes, writing is probably the most complex and the least used in most classrooms. I have found that writing can be easily encouraged, and the task of producing a meaningful message can be easy and enjoyable even for young children. I begin writing notes to the children in my classroom as soon as class members are identified. This has meant that sometimes I have even sent a note or post card to them before they enter school. Within days, I get notes back like these:

I like
you Miss Milz
Love Greg

Tiffany

I Like Me ss
Mels

As they first begin to write, children ask for a lot of help. I provide help by "taking dictation" from children. I leave a space below what they have dictated for the child to copy what they wish to write. Very quickly, I begin to ask questions, "What would you write?" and the child soon moves to independent writing. These first attempts often bear little resemblance to adult writing, yet they are very uniform and reveal the phonological relationships the child has discovered. Charles Read calls this "invented spelling" and has studied this phenomena in children as young as three years old (1975). Over the year's time as each child's knowledge grows, the spellings become more and more like conventional adult spellings. As children ask, "Did I do it right?" I can tell them they are writing like other children. As they grow and learn, their spellings will change. If they seek more information I will show them an adult spelling, but as I begin to read their writings, most are quite comfortable in allowing themselves to grow up a little bit each year. Too often children are faced with a model of perfect spelling and are so tied down with correctness that they are unable to communicate the meaning they wish to represent.

As the children begin to write notes to me, they also write to each other. Penpals can be found with a class within your school district or a nearby community. A useful adult/child pen pal relationship can be built by calling a nearby teacher education college. Language Arts students preparing to be teachers can learn as much as their young pen pals learn from writing to them.

Labeling items and making charts can be beneficial to young children if they help make the labels. Last year I had a child in my classroom who spoke no English when he entered school.

Children made labels to show him what they call things. The first words that Francis spoke in English were "2 Blue" as he pointed to a classroom chart listing the buses that the children ride to go to school.

Children of all age levels can be encouraged to keep a journal of things that interest them. As they participate in classroom activities, notations can be made in a notebook. After several months, children begin to realize the permanence of print, and how they can remember things that happened to them. Young children enjoy the interaction of having a teacher read their journals, and receiving comments or questions relating to the meaning of the passage. I never correct or write evaluative comments, such as Good, Excellent, etc. in the journals. Older children should be given the privilege of privacy, and should have the opportunity to fold a page and ask that it not be read.

October 16
to day
me and
Shirley
and
Tiffany
hav a
beg Evcrt
Btt of Cant tal

Will you tell me
Sunday? A.M.

The importance of reading to children daily has been mentioned often. As I read, I like to tell as much as I know about the author so that children can begin to understand how writers write, and then create characters which they can place in imaginary settings. Children can also relate to the many characters found in books, and begin to create further adventures for their heroes and heroines by writing their own stories. "Ramona," "Fudgie," and "Dorrie" are a few of their favorite characters they have "met" in books that I read to them. As they begin to grow in their ability to write, they begin to create original stories which can be "published" in a hardcover edition to provide pleasure for classmates, family and friends. As

students write daily, they will discover that writing becomes easier, and they will be able to notice how they are changing.

Reading, writing, listening and speaking are all interrelated and support each other. One is not used to teach the other, and no one process stands alone for instructional purposes. Instead, all are integrated as children are busy investigating the content areas of the curriculum. As children cook, explore nature, dissect a pig's heart, or read children's literature, they should be "languaging" in material that is relevant to the endeavor.

Evaluation

Evaluation in my classroom is continuous and defined in terms of each child's progress. I keep a clipboard with a class list, so that during the day I can write quick notes. These are entered on 5 x 8 cards which are kept for each child. Evaluation also needs to involve the child. During reading, a child has often commented that the story became easier as they read on. Occasionally I tape a child to show them how they are becoming more efficient readers, and I try to point out good strategies a child used after their reading has been completed. In writing, children can keep samples of their work, and the journal provides a dramatic documentation of the change occurring over time. Parents can easily understand what is happening to their child as they examine these kinds of materials.

Parent Involvement

Parents can be of great value and benefit to the students in your classroom as they have been in mine. During time set aside for independent activities, parents can provide invaluable assistance as "listeners" of children's reading, or as readers for children who need to hear stories. Parents can take children for walks around the building to take pictures for classbooks, and often are able to help assembling them.

Last year, my class made several hundred books that we "published" in our classroom. (See attached directions). Without parents involved in the book-making process, I could never have kept up with such a production schedule. Parents did the following for me:

1. **Made covers:** I had a parent meeting where I taught them how to make them. They each made several covers that night, and took one home to use with their child. Later, several made a supply for me at home.
2. **Sewing pages:** I send a package of ditto paper home with a student who has a mom with a sewing machine. I like six pages put together with the largest stitch on the machine. Within a week or so, the child brings back the inserts, and I glue in the two end-pages.
3. **Typing manuscripts:** I send several manuscripts home with a student in my room. The volunteer parent types them on a 5" wide sheet of paper. When they are returned, I cut and paste the typed copy into the previously-made blank book.

The above services are ones that working mothers often are happy to provide. As parents become a part of your classroom, they begin to see how language is learned. They see change and progress in the children, and often engage in self-evaluation of their own ideas and attitudes. At times, parents will realize they have been doing something that discourages their child from learning, or they note the inadequacy of practices they have engaged in, such as commenting, "Sound it out," when a child is using their own language. At this point of understanding, the education of their child becomes a truly shared concern.

In summary, the comprehension-centered classroom is built on a whole language base. The following drawing shows some of its many components:

Perhaps you will be able to add others. This is a classroom where children and adults live and interact every day. Room 14 is *our* classroom—a place where we are all learning and growing together.

The Comprehension-Centered Classroom

TIME TO:
talk
laugh
paint
interact
enjoy things
read
question
think
listen
write
feel
draw

PEOPLE:
kids
parents that
    listen to kids read
    read to kids at home
    make books
teacher
principal
from community
from other classrooms

A ROOM WITH:
science materials
record player
mailboxes
chalkboards
toys
puzzles
games
writing supplies
math games
bulletin boards
old typewriter
calendar
lots of BOOKS
  comics
  magazines
  predictable
  old
  funny
  without words

  written by kids
  sad
  reference
  story
  factual
  written by teacher

PLACES TO:
watch
paint and draw
mess around
sit and think
write
read
listen to tapes and
   records
observe things
play
be quiet
discuss
talk

EVALUATION:
continuous
self
developmental
in conferences

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Book Making: A Basic Book [*]

by Vera Milz, Way School, Bloomfield Hills, Michigan

Children write or dictate a manuscript. After the first writing is complete—have the child read the manuscript with you. Then help to edit for publication. Offer suggestions by skilled questioning which will not in any way destroy or diminish the author's pride in the product.

Discuss placement of text, and where illustrations will go in the book.

Type the entire manuscript. Work within margins of 5". State the author's name, grade, school, and date written on the title page. Include dedications and table of contents if the child wishes.

Make the book:

a. Cut two pieces of cardboard (6 x 8")

b. Cut contact paper or wallpaper or fabric with matching dry mount or cleaner bags

c. Adhere above covering to cardboard. (14 x 10) Leave one fourth inch between cardboards, or the book will not close. Mitre corners. Cut off a triangle of contact paper, or fold corners in if it is fabric or wallpaper. Fold side edges in. Paste the triangles of contact paper over the four corners to reinforce. Set aside.

d. Cut pages to size. (11 x 7½"). Ditto paper works well. Fold pages in half.

e. Sew paper down the middle fold. This can be done by machine (largest stitch available) or by hand (punch an uneven number of holes—start sewing in the middle from the back and go in and out to each end.)

f. Paste end sheets to the cover you made previously. Use a rubber cement.

g. Cut text you typed before apart, and paste in book using rubber cement.

h. Have the student make the illustrations. (If crayon is used, iron to set crayon and smooth the sheets—just face the illustration down on old newspaper, and use a low temperature). Cut to 5 x 7". Paste in book.

i. Put title on cover.

Read and share the new book. Enjoy the pleasure of publishing a book with a young author.

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[*] This size can be modified according to your needs and available materials. I make classbooks approximately 9 x 12", and miniature books 2" x 3".

Discussion Topics

1. Vera Milz makes the following comments about children learning to read:

   They need to become "someone who can make sense out of print."
   They need to "build on language strengths."
   They need to "know that print communicates a message."

She explains ways that she has helped children develop these skills in her primary classroom. Apply these concepts to a 4th grade, 7th grade, and senior high classroom. What approaches, techniques, or materials can be used to accomplish these important goals?

2. Vera Milz has several parent aides in her classroom involved in several activities. Many schools have parent aides available, but they are not really used effectively. Suggest as many ways as possible that parent aides could be used for maximum benefit in a comprehension-centered or "whole language" classroom.

3. Many of the presenters in this series have mentioned the importance of reading to children every day. Many teachers do include this as part of their program, especially at the primary level, but they see it primarily as entertainment or providing enjoyment, and often as a "reward." What other important benefits do children gain from this activity? What, specifically, do they learn from the experience to warrant identifying it as an "essential" in a comprehension-centered program?

4. "Setting the stage" for learning is very significant in an educational environment. Many researchers have found that the initiating experience, the first few minutes or days, determine the effectiveness of the learning experience. Milz mentions several things she does or "stage-setting" techniques in her elementary classroom. What messages are conveyed to children by these techniques? What other techniques could be used at elementary and secondary levels to convey the same messages?

Chapter 1 Resource Materials

Workshop Leader's Guides

One-Hour Workshop Series

The workshop series is designed for use with teachers, coordinators, instructional assistants, and others associated with Chapter 1 programs. They can easily be adapted also for use with regular classroom teachers or other educators. The materials are designed for easy use by anyone with a background in education and some workshop skills.

Each of the workshops contains all of the materials necessary to conduct a successful workshop: a presenter's guide, participant handouts, transparency masters, a background paper, support materials, resource articles, and a bibliography. While the following are all part of the one-hour series, the extra materials and activities make it possible to extend them easily to one-and-a-half or even two hours.

Striving for More: Advanced Skills in Chapter 1

This workshop introduces participants to research and practical theory on advanced or higher order thinking skills: "the why, what, and wherefore of advanced skills." Participants will understand the requirements of teaching advanced skills in Chapter 1 programs; become familiar with current research, terminology and skills in instruction. The emphasis of the workshop is on practical classroom suggestions. The ASCD framework, *Dimensions of Thinking*, is used as the organizer for discussing thinking strategies to incorporate in classroom instruction.

Advanced Skills for Chapter 1 Mathematics: Estimation

The goals of this workshop are to help participants understand estimation and its importance; recognize classroom situations in which estimation should be used, and to learn specific estimation strategies to use in an instructional program. Hands-on experience with estimation problems and suggestions for classroom teachers make this a lively and stimulating resource for encouraging the development of estimation skills in the classroom.

A More Advanced Skill for Chapter 1: Problem Solving

Problem solving should be included throughout the curriculum, including mathematics. It should not be taught as a separate unit or at "special times." The premise of this workshop is that problem solving should be the focus of mathematics instruction. Additional value is placed on other skills such as computation and measurement when students realize the value of these skills for solving problems. Problem solving is the first standard at each grade grouping in the NCTM *Curriculum and Evaluation Standards*.

INFORMATION REQUEST
ORDER FORM

The resource materials are available from the Chapter 1 Clearinghouse for the cost of reproduction. To order any of the materials, send this form with check or purchase order.

Name: _____

Title: _____

Address: _____

_____

_____

Phone: _____

Mail Request to:

Clearinghouse
Advanced Technology, Inc.
2601 Fortune Circle E.
Indianapolis, IN 46241
(800)456-2380
(317)244-8160

Striving for More: Advanced Skills in Chapter 1

☐ Complete Workshop $38.00

☐ Paper only $18.00

Advanced Skills for Chapter 1 Mathematics: Estimation

☐ Complete Workshop $36.00

☐ Paper only $15.00

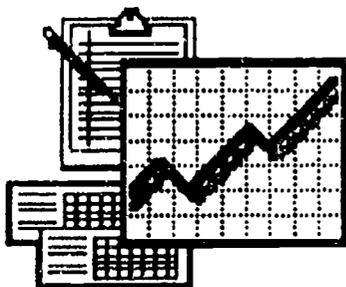## A More Advanced Skill for Chapter 1: Problem Solving

☐ Complete Workshop $36.00

☐ Paper only $15.00

Coordinating Instruction in Chapter 1 Programs

☐ Purchase $34.00

☐ Rental $10.00

Database

☐ Reading or Inst. Mgt. $20.00

☐ Reading and Inst. Mgt. $30.00

Videotape

Coordinating Instruction in Chapter 1 Programs: Resource Kit

The primary purpose of the 15-minute video program and accompanying resource guide is to help improve instruction for Chapter 1 students. The video program and related activities are designed to assist Chapter 1 and regular staff in coordinating instructional services so that all Chapter 1 students will be able to achieve success in the regular program. The kit was designed to be used for Chapter 1 inservice or for a district or school to use for an inservice program with the entire staff.

Computer Databases

The resource database is available on an IBM-compatible set of diskettes that are self-booting (no other software required). The database currently includes two topics (three disks each):

Reading Comprehension

Instructional Management

The database provides abstract summaries of articles on numerous sub-topics. The database disks are enclosed in a three-ring notebook.

These materials are developed under contract with the U.S. Department of Education and are made available on a cost of reproduction basis only.

Resource Materials for Chapter 1 Program Improvement

Workshop Leader's Guides
- Advanced Skills
- Problem Solving in Mathematics
- Mathematical Estimation
- Reading & Reading Assessment

Videotapes
- Coordination
- Chapter 1

Computer Databases
- Reading/Language
- Instructional Management
- Advanced Skills
- Mathematics

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