



# Rethinking Instructional Delivery for Diverse Student Populations:

*Serving All Learners with Concept-Based Instruction*

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When students arrive at content classes reading below grade level, teachers are challenged to deliver complex content. Also, students often study facts without reaching larger concepts. Research at the University of Oregon has concluded that if the teacher takes responsibility for identifying and elucidating the concept within course materials, both of these difficulties can be overcome. Overt identification of concepts and their characteristics and the deliberate use of graphic organizers reduce the reading comprehension demands placed on students with low abilities. Using the functional taxonomy presented, teachers can develop effective student exercises and assessments. An example shows that students provided with the concept-based approach outperformed students in a more traditional classroom on a problem-solving task.

**M**any students arrive at middle and secondary content classes reading significantly below grade level. Whether a result of learning disabilities, language barriers, or low skill levels, struggling readers often focus on decoding text at the expense of understanding material (Jitendra et al., 2001). Because textbooks are commonly used in content classes, students face serious difficulties attempting to understand the material. The diversity of student characteristics and learning needs can present seemingly innumerable challenges to general education teachers as they deliver complex content material in a diverse classroom. It follows that student learning is potentially jeopardized because of inappropriate instructional materials and overburdened teachers who are unable to serve the needs of all students.

To help students challenged by heavy reading requirements in content classes, text-related demands must be reduced without compromising the content. Addressing this issue has been the focus of ongoing work at the University of Oregon's Behavioral Research and Teaching (BRT) facility. We have been successful in redirecting curriculum and assessment practices to take into account not only the difficulties both skilled and struggling readers face in learning content material but also the instructional techniques teachers have employed for some time. Our goal is to increase student comprehension and retention through instructional modifications rather than tolerating the loss of instructional time by waiting for students' reading abilities to improve.

## Basis for Research

Teachers can address the needs of individual students with varied abilities and backgrounds by drawing from a smorgasbord of techniques and strategies, but this is taxing for teachers and may well result in confusion for the students. Thus, teachers need a strategy that supports students with cognitive disabilities and specialized learning needs while still advancing the learning of other students in the classroom.

Early research at BRT indicated that many students in general education classrooms, even those who test well in decoding and comprehension, have difficulty prioritizing information within the text (Tindal, Nolet, & Blake, 1992). This supports conclusions drawn by other researchers in the field (Bryant, Ugel, Thompson, & Hamff, 1999; Garner, Gillingham, & White, 1989) and highlights the critical need for content-area reading supports. Students are often distracted by alluring or seductive details that, although interesting, may not be as instructionally important as other information in the text (Garner et al., 1989).

The difficulty many students face in trying to isolate important information from the text is easily traced to

the nature of textbooks. Both researchers and reviewers have noted that most information in textbooks is purely factual and fails to show how discrete facts can be linked together to form complex knowledge forms (Jitendra et al., 2001). Our research indicates that only high-achieving students ever arrive at a full understanding of the underlying concepts and principles from the content presented in texts. This shortcoming among textbooks leaves the responsibility for drawing these connections to either the teacher or the students themselves.

## A Concept-Based Model

Because most students cannot link facts to concepts, classroom teachers must take responsibility for identifying concepts within the curriculum, an explicit and overt act. The following concept-based instructional model was designed to accommodate students with various learning needs while raising the expectations and performances of all students. For some time, other researchers have been investigating issues related to concept-based teaching with similarly positive results (Erickson, 1998; Roid & Haladyna, 1982). Our model draws on this earlier work but is characterized by three distinct components:

1. The teacher determines the concept that is the target of instruction.
2. A graphic organizer is developed to illuminate this concept for the students.
3. Students' success in mastering the concept is measured by applying it across instances using increasingly complex critical thinking measures.

Under the model, we define a *concept* as consisting of the following:

- a broad class of objects or events bearing a unique label and spanning multiple instances and examples (e.g., revolution vs. the American Revolution);
- attributes (i.e., those elements of the concept that fully describe the concept and separate it from similar concepts); and
- examples and nonexamples that illustrate the attributes relative to a specific instance.

A key component in this effort is identifying the defining attributes for the concept. Other researchers have made use of concept-based models or graphic organizers and have reported some success. The model described here relies heavily on including attributes that can generalize to multiple instances of the concept; other models depend merely on defining the concept exclusively with a collection of example facts (c.f. Boudah, Lenz, Bulgren, Schumaker, & Deshler, 2000; Erickson, 1998; Kameenui

& Carnine, 1998). Generalizing concepts is the primary strength in our instructional model, and the attributes greatly enhance this generalizability across multiple instances.

The graphic organizer in Figure 1 for the concept “world war” illustrates this model. *Instances* of a world war include World War I, World War II, and the Cold War. The *attributes* of a world war used in this lesson sequence are technology, alliances, and dominance. These attributes and their associated *examples* (from the instance of the Cold War) are presented on the graphic organizer. This unit, presented in an 11th-grade American history class, helped all students to better understand the associations and relationships among World War I, World War II, and the Cold War (i.e., shared aims among alliances, striking improvements in technologies, and universal efforts at and reversals of domination) and dispelled many previously held misconceptions (see Figure 2, for an example of student work). Thus, isolating the critical concepts allows both the teacher and the students to focus on information that is necessary for understanding the domain of instruction (Voltz, Brazil, & Ford, 2001). All students will benefit from such explicit organization of important knowledge.

In addition to the teacher’s effort in identifying the essential concepts for the instructional unit or lesson, graphic organizers, such as the one presented in Figure 1, are essential elements of concept-based instruction because they explicitly illustrate the structure and organization of information (Hudson, Lignugaris-Kraft, & Miller, 1993; Tyree, Fiore, & Cook, 1994). By constructing a visual display of relevant content material, students are able to link prior knowledge with new learning, thereby deepening their level of understanding the material (Bryant et al., 1999; Merkley & Jefferies, 2000/2001).

To design a graphic organizer, the teacher identifies the central concept that will be the focus of instruction. Associated attributes and their relationship to the concept are then determined. Next, a visual display of the information is constructed that explicitly links the attributes with the concept in a manner that highlights the relationships. Finally, space is provided for recording examples and nonexamples for the attributes. This design enables students to discern important facts from statements that may be interesting but that are not integral to the concept. Thus, all students are presented with a model for drawing meaning from the text, identifying concrete examples, and distinguishing between seductive details and critical facts. Ellis (1994) presented designs that showed cause-and-effect relationships, compare and contrast, and sequential organization of information. Students with disabilities or other reading difficulties will benefit substantially from a visual representation of the structure and organization of relevant information (Hudson et al., 1993; Jitendra et al., 2001).

These two elements—overt identification of subject-specific concepts and the creation and completion of graphic organizers—are central to the model. Carefully planned assessments aligned with the instructional content and goals effectively measure student acquisition of concept-related materials. This does not suggest that teachers abandon existing measures but rather that they consider alternatives appropriate to the concept addressed rather than the factual information presented in the textbook. Higher-order thinking skills can be measured across the student population when assessments are aligned to concepts rather than to facts.

### Aligning Assessments

Assessment tasks in this model are based on a functional taxonomy similar to that proposed by Benjamin Bloom in the 1950s (University of Victoria, 1996). Here, however, the levels of intellectual engagement are operationalized to provide clear opportunities for students to demonstrate their levels of accomplishment (see Table 1). For example, in Bloom’s taxonomy, instructional objectives might require students to comprehend or analyze the ancient Greeks’ influence on the development of democratic models and institutions. The taxonomy presented in this model would ask that students summarize or illustrate instead. The latter acts are directly measurable compared to Bloom’s taxonomy, which asks the teacher to determine what sorts of tasks might best reflect comprehension or analysis.

Applying concept-based instruction, teachers can use the targeted intellectual operations to develop and implement student practice exercises and assessments. Generally, assessments for this model are open-ended in an effort to move students’ thinking beyond simple recall. It is difficult, although not impossible, to assess and evaluate students’ ability at the more advanced levels of this taxonomy using multiple-choice or short-answer questions. Therefore, we have focused our attention on open-ended essays scored using a scoring guide. Despite the greater time demand involved in scoring, most teachers are amenable to assessments of this type for higher-level intellectual operations; they believe that the significant improvement in the amount of information such assessments return on student ability is worth the extra effort at scoring.

### An Example

This model of concept-based instruction has been widely implemented and studied in middle and secondary schools in a variety of content areas in our geographic region. To illustrate the potential benefits this model brings to teachers and students, we will briefly present our experience in two sixth-grade social studies classes studying the culture and history of Meso-Americans. A technical report on

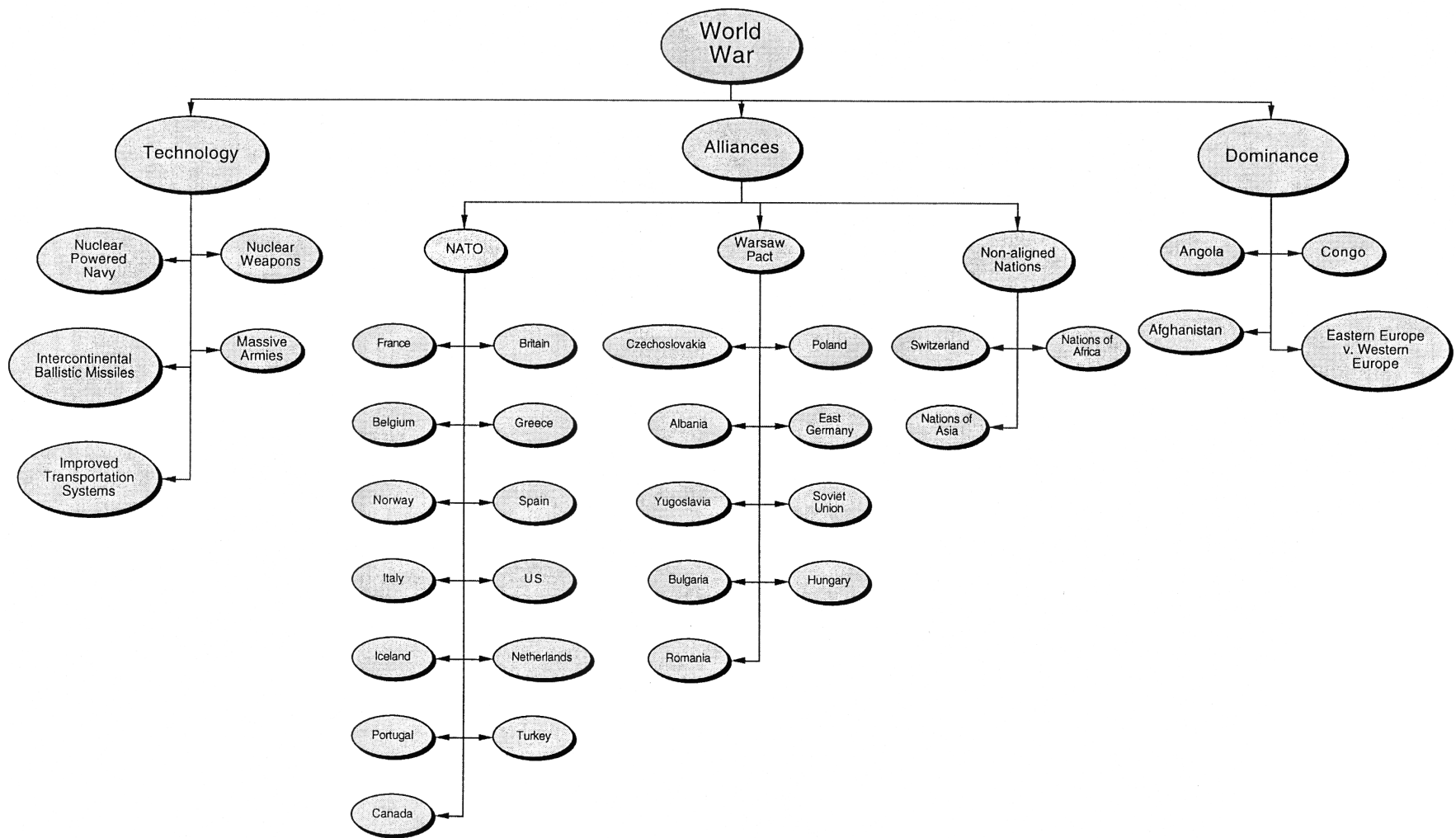


Figure 1. Graphic organizer for world war (Cold War examples).



### Prompt

1. Describe the role technology played on the German war plans and the blitzkrieg strategy.
2. How did the alliance of Great Britain, the U.S., and the U.S.S.R. help the allied powers take back France following the D-Day invasion?

### Student Response (transcribed with errors)

1. A. The battle was affected by alliances. The US sent our left over war material to Great Britain.  
B. The battle was affected by the higher advanced radar system—and the British had better planes.  
C. It was also affected by the strategies of Britain. They blocked out towns at night, and the germans couldn't blitzkrieg!
2. A. Germany could've won if Italy would've surrounded britain.  
B. If Germany Had a better navy and radar system they could've won.  
C. If Germany Had attacked great Britain and overwhelmed them sooner and faster Germany could've won.

**Figure 2.** Student work sample related to world war.

**Table 1.** Taxonomy of Intellectual Operations

Intellectual operation	Student performance
Reiteration	A verbatim reproduction of material that was previously taught.
Summarization	Generation or identification of a paraphrase, rewording, or condensation of content presented during instruction.
Illustration	Generation or identification of a previously unused example of a concept or principle.
Prediction	Description or selection of a likely outcome, given a set of antecedent circumstances or conditions that has not previously been encountered.
Evaluation	Careful analysis of a problem to identify and use appropriate criteria to make a decision in situations that require a judgment.
Explanation	Description of the antecedent circumstances or conditions that would be necessary to bring about a given outcome.

this research, *Tech Report on Meso-American Concept-Based Research*, provides a more thorough explication of the specifics of this effort (see the BRT Web site at <http://brt.uoregon.edu/techreports>).

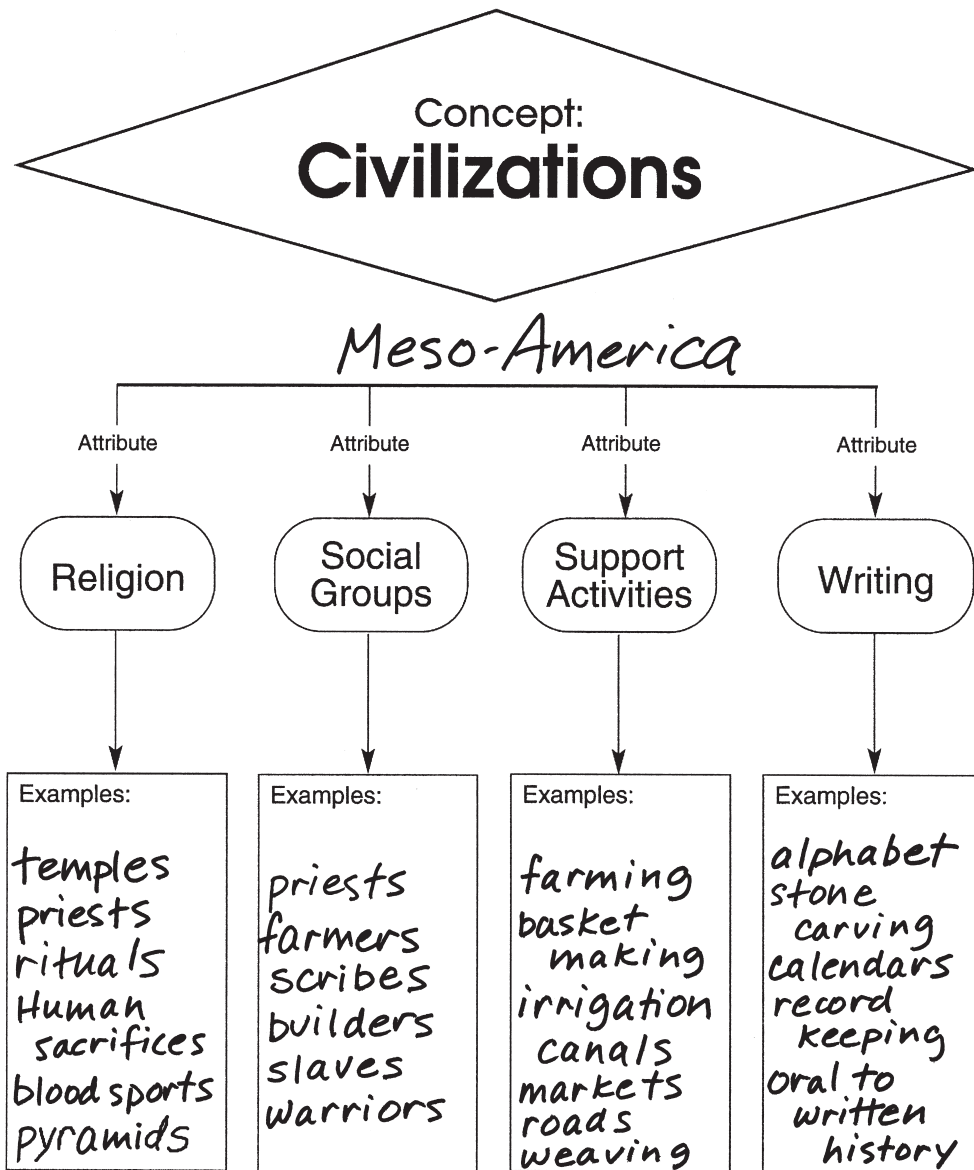
The purpose of the study was to explore the effects of using concept-based instruction on student understanding and retention of text material. The students of two classrooms, taught by Leroy and Daphne, were chosen to participate. Students in these two classes ranged from the 3rd to the 98th percentile rank on a statewide, standardized assessment of reading with an approximately equal distribution across classes.

Leroy structured his lesson in a traditional lecture format. Daphne, on the other hand, presented information using the concept-based approach, incorporating the graphic organizer shown in Figure 3 as an organizational strategy for the content of the textbook. Daphne identified civilizations as the key concept with religion, social groups, support activities, and writing as supporting attributes. Both teachers used the same textbook as the primary source of content information. At the end of the unit, students' understanding of the content materials was assessed using a traditional fact-based reiteration test and two open-ended assessments. One transfer task required the students to create a map of an imaginary culture's island habitat that comprised characteristics and features necessary to the functioning of civilizations. The second open-ended assessment asked students to write a description of their map, including an explanation of the features shown on the map and the significance of their relative placement. The scores from these various assessments were compared to determine the effectiveness of the instructional model.

Students presented with the concept-based approach performed much better on the open-ended assessments that required them to illustrate the concept in a new instance, demonstrating higher-order thinking. For example, Fred, a student ranked in the 14th percentile on the statewide reading assessment and identified as an English language learner, clearly demonstrated a thorough understanding of the concept and attributes. His response to the second open-ended assessment task is presented in Figure 4. The essay in Figure 5 was written by Daisy, a student ranked in the 90th percentile on the statewide reading assessment. Both essays illustrate that each student mastered the content.

Students who received instruction using the concept-based approach and who organized information from the text into a graphic organizer performed as well on the reiteration test as the students who received a more traditional instruction. This is an important result. A common concern among novice users of concept-based instruction is the potential loss of important factual instruction in favor of the more ethereal concept-based focus. Given these results, this appears not to be the case.

Throughout our research, our findings indicate that students across the spectrum of reading skills show consistent improvement toward mastery of higher-order thinking tasks when taught using the concept-based approach.



**Figure 3.** Graphic organizer for civilizations (transcribed).

I found my island in the Pacific Ocean. People all ready lived there. They heard that I have read about the early civilization of amicas-omecs, Mayas, Aztecs, and Incas. They think I know about four important feature of civilization. Peoples belief was that the temples were religion. People lived together by building a small villige so they can support themselves. By the water the put a farmed land farmers go fishing a lot that's also another thing they support them selfs they had trails to go from one city to the other., People communicated with writing language that is colled hieyoglyphics that how they know how to get from one village to the other by putting signs with hieyroglyphics.

**Figure 4.** Fred's description of his island transcribed (with errors) from student's handwriting.

## SURGE ISLAND

I have been appointed King of Surge Island. The waves here surge into the coastline of the island giving it its name. The civilization here has not yet developed an they (the people) have asked me to come up with some advice for our under-going religion, written language, how to live and how we can work together to stay alive. Here are my ideas:

### RELIGION & GOVERNMENT

In religion, everyone within our empire will worship the God of Gods, the Sea God. Each year prisoners of war will be sacrificed to the Gods, their blood will keep the Gods happy. In every city there will be a temple where people will hold religious ceremonies, in honor of our God, the "Sea God".

The government will basically be the king. What ever the king says goes. New kings will be appointed dies or is no longer able to make wise decisions. Each king that dies will have a proper burial sight. This sight will be a small temple or pyramid which ever is suitable at the time. When the king is being put in his temple or pyramid a priest will lead a religious prayer for the king.

### HOUSING

Since our land is some what marshy, I think it would be in our best interest to make our houses out of reeds. We would have to poke the reeds into the ground in the form of a round circle, then lay some reeds on top for a roof and tie it to the circular bottom, with the stalks left over from maize.

The people of our civilization will live in different cities or clusters of houses. The temple where people will hold religious ceremonies will be in the center of the city or the center of the cluster.

### OCCUPATIONS

Some people will become peasants, and will begin farming or working on the farms. Their primary crops will be beans and maize. One eighth of all crops grown will become the king's, to serve him and the people within the kingdom.

We will probably have to dike up and build canals for the rivers. This will allow for better irrigation, and also help control the water, so we don't have to worry about flooding in our cities. On the map I have shown where dikes and canals are to be made.

Some people will need to take up a career in craftmaking. This is so when over-seas travelers want to trade, our craft-workers will be able to trade or sell sea shell necklaces, bracelets, and other items made from the island's shore! Also, some people will need to become scribes. That way each city within our empire can communicate through a system of writing.

**Figure 5.** Daisy's description of her island transcribed (with errors) from student's handwriting.

## Conclusion

The outcome described in this example is typical of the results across our efforts to implement and test this model. Not only do students consistently perform as well as before on lower-level intellectual operations, they also reliably outperform students receiving traditional instruction on assessments evaluating more advanced intellectual operations. This result is not surprising given that most textbooks present information at the lowest level of intellectual operations, leaving advancement beyond this point up to the teacher.

Faithfully implemented, this model appears well able to accommodate the diversity of learning and reading skills found in contemporary classrooms without compromising expectations of student learning. Indeed, strong evidence has suggested that all students, including those identified as special needs and as talented and gifted, taught with this model can be expected to succeed not only in mastering the facts that fill their textbooks but also in demonstrating skill in applying a deeper understanding to unfamiliar instances of the same concept.

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## AUTHORS' NOTES

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# Words

## Integrated Decoding and Spelling Instruction Based on Word Origin and Word Structure

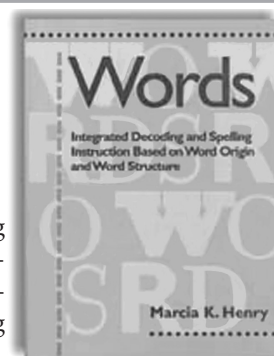
Marcia K. Henry

This teacher's manual contains 50 lessons for integrated decoding and spelling instruction. It was designed for classroom teachers in Grades 3 through 8 and teachers or tutors of students with learning disabilities.

The curriculum in *Words* consists of five units based on word origin and word structure. In a discussion mode, teachers and students organize letter–sound correspondences (phonics); study syllable patterns; learn about the three major language origins in English (i.e., Anglo-Saxon, Latin, and Greek); examine morpheme patterns (compound words, prefixes, roots, and suffixes); and practice decoding and spelling multisyllabic words taken from math, social studies, and science textbooks.

Each of the 50 lessons is loosely scripted for 45-minute sessions. Each lesson contains an opening statement of purpose, followed by middle activities, such as generating words

fitting a specific pattern, reading words, and spelling words individually or in phrases or sentences. Lessons close by probing the usefulness of the patterns, rules, or concepts taught and summarizing the important concepts. Follow-up activities are recommended to reinforce lesson content. The manual also includes a pretest, unit quizzes, a posttest, content area word lists, nonphonetic word lists, and spelling rules. *Words* can be used effectively by parents, teacher aides, and teachers in both general and special education classrooms.



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