1990

Integrating reading and literature into content area curriculum through thematic units

Yvonne R. Sisk

California State University

San Bernardino

INTEGRATING READING AND LITERATURE INTO CONTENT AREA CURRICULUM THROUGH THEMATIC UNITS

A Project Submitted to

The Faculty of the School of Education

In Partial Fulfillment of the Requirements of the

Degree of

Master of Arts

in

Education: Reading Option

By

Yvonne R. Sisk, M.A.

San Bernardino, California

1990

APPROVED BY:

Advisor: Dr. Adria Klein

Second Reader: Joe Gray

Summary

The goals of this project include developing a way to efficiently teach the many required subjects in the overloaded elementary school day and incorporating literature into content area curriculum. This project also attempts to design curriculum that will help students develop thinking and social skills that they will need in an increasingly service-based economy and more global, unified world. Lastly, this project endeavors to align curriculum with cognitive theories of learning.

Cognitive theories of learning argue that learners actively seek meaning and connections. Learners relate new information to their existing knowledge, or schema. Language and schema are interactive, so learning of language--reading, writing, listening, and speaking--is closely tied to content area learning. Implications for curriculum include a holistic, child-centered program in which concepts are connected to language and to each other, and in which children have choices.

The review of the literature on integrated curriculum and thematic units indicates that integrating language and content areas can provide for

maximum meaningful and efficient learning of both language and content.

Integrated curriculum is not new. Throughout recent American history curriculum focus has shifted between segmented and integrated. Educators have described and developed many different types, forms and levels of integration, including the thematic unit.

A thematic unit may be built around a topic or concept, and includes activities and projects incorporating most subject areas. Students develop reading, writing, listening, and speaking abilities while learning about the unit topic. Students frequently have opportunities to choose their own activities and to work together. Although there is no one correct way to write a thematic unit, some general guidelines exist which may help teachers plan and implement a unit effectively.

The project includes three thematic units which incorporate many curricular areas in addition to the language arts. The units are built on the topics, plants, teeth and weather. Although designed for second grade, the units are adaptable for other primary grades.

TABLE OF CONTENTS

Introduction

"The aim of science is not things themselves, ...but the relations between things; outside those relations there is no reality knowable" (Poincaire, 1952, p. xxiv).

Poincare's statement about science can be applied to other academic endeavors. The aim of education is not facts themselves, but the relations between ideas. School curriculum has often approached learning as a collection of facts rather than emphasizing the relationships between those facts. Children, therefore, may not understand the connections between various subjects they are expected to learn. Learning may lack meaning for many children because they do not comprehend the whole picture.

This paper proposes integrating curricular areas around a theme in a way that allows children to work together to explore connections between subjects. Not only does this approach save valuable class time, but also helps learners develop their thinking and social skills, learn material in a holistic way, and promotes use of literature and language across the curriculum.

Statement of the Problem

One concern regarding much of the present day curriculum is that society expects schools to teach too much in a short time period (Hunkins, 1982; McCutcheon, 1978; Melle and Wilson, 1984; Shoemaker, 1989). The schools are largely reactionary to society's various demands, adding new curriculum to address each of society's problems (Hunkins, Shoemaker).

As a solution to this problem, Nelms (1987) suggests that integrating language and content areas by providing instruction in reading and language skills as they apply to other curricular content would reduce time required in direct instruction, thus increasing time for other areas. Teaching reading and language skills through other curricular content areas would increase time for those content areas.

Brountas (1989) explains that a thematic approach meets the criteria of efficiency and effectiveness. "As professionals we are constantly striving to be more effective and efficient teachers...efficient in the use of time, material and energy...the thematic approach meets these criteria very well" (p. 53).

In addition to limited time, some writers express concern that education needs to meet changing needs in a changing world. The world situation is becoming more global and interdependent. The economy is increasingly information and service based while more information is available than ever. Family structure and social demographics continue to change (Berg, 1989; Keitz, 1987). Furthermore, due to the influence of the media, declining family support and structure, and the cultural value of instant gratification, students are different from those of 20 years ago (Gilbert 1987). Gilbert concludes that "we can no longer be assured that the education we received is still adequate or meaningful for our children" (p. 10).

One of the current influences on children is TV. Postman (1980) argues that television is hostile to the world, partly because it discourages language development and intellectual activity and provides no connections of content or of people. Postman suggests that the schools take over these responsibilities through integrating curriculum around human themes.

In the future children will need, more than ever, to be lifelong learners who can cope with diversity.

Students need to become active learners with more advanced cognitive skills. They need to be able to effectively communicate. This calls for a process approach to curriculum in which students develop strong communication skills (Shoemaker, 1989). Berg (1989) writes, "Clearly the knowledge and skill requirements for this vision of the future cut across the curriculum" (p. 39).

As for language use and acquisition, Gambell (1987) argues that in the "Information Age" students "need to be able to distinguish between different uses for language for different purposes and audiences and to critically evaluate language...Language needs to be conceived of as a communicative medium rather than a body of skills" (p. 11).

Boyer (1982), president of The Carnegie Foundation for the Advancement of Teaching, argues that students are highly individualistic and need to understand the interdependence of a more global world. Boyer suggests organizing the curriculum around shared experiences to accomplish this.

In addition to the changing needs of a changing world, there are other reasons to integrate curriculum. In recent years cognitive theories about

learning have emerged. This information points to the value of an integrated curriculum.

One aspect of cognitive learning theory is that a learner is actively involved in the learning (Barnes, 1987; Schuell, 1986). A study by Rickards and August (1975) shows that student-generated structure facilitates reading comprehension more than teacher-generated structure. Referring to this study, Wittrock (1986) concludes, "It is the learner's generation of meaning that promotes achievement" (p. 309).

Furthermore, an active learner associates new learning to what is already known. Wittrock (1986) points out, "Learning is facilitated when the learners construct images and verbal representations that relate old memories to new information, especially in organized or sequenced ways" (p. 311).

This association of new learning with old involves schema theory. Schema is the organized, structured, and abstract information one has about a subject. As a person learns new information, that information may be assimilated, or included, in the schema. If the new information does not fit into the existing schema, the new information is accommodated,

or, in other words, the schema is adjusted to make sense of the new learning. Some schema is necessary for understanding most experiences or information (Anderson, 1977; Pappas, Kiefer & Levstik, 1990; Schuell, 1986). In this way, children are active learners, constantly formulating and testing new hypotheses.

An integral part of schema development is language development. Concepts and language are learned simultaneously (Pappas et al., 1990). After closely observing the learning process of a child, Clem and Feathers (1986) concluded that content learning is closely related to functional use of language. Hart (1978), discussing brain research, points out that young children especially must verbalize in order to learn. It is logical, therefore, to integrate learning of language with content in curriculum.

Because learners associate new learning with their existing schema, they constantly seek meaning and connections. Knowledge is not segmented in a learner's brain. Kucer (1989) states, "we don't have sections for literature, social science and science. Nor do we store information from books in one part,

information from memories in another part...We store and integrate information based on conceptual relatedness" (p. 35).

Further illustrating this concept, Gilbert (1987) explains the difference between content and process in learning. Content is information, whereas process is the connection and patterns within that information. One must have the 'whole' experience, an understanding of what is to be accomplished, before the content has meaning and relevance. Gilbert states, "We know that learning is a wholistic experience; seeing connections and patterns is a vital part of that experience" (p. 9).

Gambell (1987) further points out the current shift in thinking from language as content to language as process. Mastery of language results from using language in all subject areas and in a variety of situations, not from receiving instruction in language mechanics.

Shoemaker (1989) also relates cognitive theories of learning to suggestions for curriculum.

> ...the human brain actively seeks patterns and searches for meaning through these patterns. Learning should involve the

opportunity to explore these pattern concepts.

Meaning more readily comes when new learning relates to past experience. Schools should involve students in real-world experiences instead of contrived exercises.

The brain processes and organizes many things--both parts and wholes at the same time. Students should be exposed to much more input than the traditional classroom provides....

Learning is a collaborative endeavor. Schools should shift from competitive models to models in which students and teachers work together in cooperative environments (p. 13). Integrated curriculum can accomplish all of these suggested items.

In addition to saving time, helping students prepare for the future, and concurring with cognitive learning theory, integrated curriculum allows literature to become an integral part of the whole curriculum.

Children need exposure to all types and genres of quality literature. Tunnell and Jacobs (1989) cite

numerous research projects which conclude that children learn better and read better using literature. Literature helps children focus on meaning and deepens their knowledge of language.

The History Social Science Framework for California Public Schools (1988) calls for enriching children "with the use of literature, both literature of and literature about the period" (p. 4) of study. The California English-Language Arts Framework (1987) advocates a literature-based program "to touch students' lives and stimulate their hearts and minds" (p. 7). This framework states that literature moves students toward higher thinking, engaging them in ideas and values, while motivating learning.

O'Brien (1988) writes that literature can capture the human element, bringing history alive, as well as deepen and extend understanding.

In addition, literature provides background information, thus adding to a child's schema. Because comprehension depends on schema, literature enhances the reading experience (Barr, 1988; Brozo & Tomlinson, 1986; Moss, 1990). Literature also acquaints students with narrative structure, or story language, allowing them to better predict and comprehend when reading or

listening (Stott, 1987). Not only does literature provide a model of story language for reading, it also serves as a model for writing (Routman, 1988).

Moss (1990) also points out that across the curriculum literature can "serve as a springboard for inquiry and observation" (p. 19). Students can read literature and move into active observations and experiences. Rudman (1983) comments, "Use of children's literature can intensify and augment learning in every area of the curriculum" (p. 13). Literature provides opportunities for children to find themselves and value cultural diversity. It provides a practical way for children to learn about the process of research while studying content.

Brozo and Tomlinson (1986) state that literature "makes content curriculum more palatable, comprehensible and memorable...use of literature is likely to promote students' interest in and involvement with content material and thereby increase their chance of learning" (p. 288).

In conclusion, integrated curriculum, as proposed in this paper, is efficient, helps prepare students for the society of their future, is in harmony with

the way students learn, and enriches children's lives through literature.

Procedure

The thematic units proposed in this paper will attempt to integrate most curricular areas with literature-based instruction. Students will learn content through literature and integration of all the language arts--listening, speaking, writing, and reading. Language will be treated as a process by which to receive, comprehend, and communicate meaning, rather than as an end in itself.

Thematic units, as proposed herein, fit on the reading continuum in a transitional stage between skills and whole language, closer to whole language than skills.

On the whole language side, the units provide children with choices, use reading and writing for meaning, and rely on intrinsic motivation. Children often work together as a community of learners. Some writing options include creative, personal expression. Suggested evaluation techniques include ongoing holistic methods, such as miscue analysis, learning logs, and student portfolios.

The program, however, departs from whole language in some ways. The children do not have a choice about content topics nor do they have major projects to explore using a discovery approach. Writing assignments include some individually expressive writing on the whole language side, but some writing assignments are more skill oriented, including fill-in-the-blank sentence structures.

The units do not address reading and writing strategy instruction. Each teacher using the units would determine specific reading and writing strategy needs of a particular class of students and address those in context of the unit. How a teacher chose to do this would affect to what degree the unit, in actual operation, was whole language, transitional, or in a skills oriented position on the continuum.

Literature Review

The following chapter covers the recent history of integrated curriculum in the United States as well as philosophy supporting integrated curriculum. The chapter reviews several types of integrated curricula including a detailed review of literature dealing with the thematic unit.

History of Integrated Curriculum

The idea of integrated curriculum is not new. Throughout recent history education's pendulum has swung between segmented and integrated curriculum under various forms and terminology with reading and literature playing various roles.

Von Bracht Donsky (1984) studied textbooks to determine the role of writing and literature from 1900-1959, including the extent of integration into the curriculum. In the early 1900's teachers taught literature and grammar side by side. With the influx of immigrants around 1907 literature began to disappear from text books and schools depended more on oral recitation, partly because many schools could not afford texts.

During the 1920's schools used more texts, but literature was mostly supplementary. During the

1930's curriculum largely was interdisciplinary, with language instruction drawn from the natural and social sciences which were organized into holistic units. Peer teaching and revision in writing were common (von Bracht Donsky, 1984).

During the 1940's and 1950's academic instruction, rote learning, and memorization were down played, and emphasis was on personal growth (von Bracht Donsky, 1984), but after Sputnik there was a push for stronger academics in the late 1950's and 1960's, leading to a more splintered curriculum (Gilbert, 1987).

Later, during the social turmoil of the 1960's, critics blamed the schools for over regimentation and ignoring student needs. This led to more student-centered integrated curriculum in the late 1960's and 1970's. However, a decline in academic scores and a belief that students were unprepared for the work force followed this period (Bunting, 1987).

According to Bunting (1987), an integration of student- and academic-centered curriculum, as proposed by John Dewey, would balance curriculum between student-centered goals and academic goals. Dewey advocated a balance between the child-centered

curriculum and academic disciplines through an integrated, experience-based curriculum.

Dewey (1902, 1915) viewed the child as a developing, active learner who learns through experience. Dewey called for a meaningful curriculum relating the child's experience to the curriculum.

Dewey (1915) sought a compromise between the sect that put the curriculum over the child, expecting the child to divide, sequence, and master the curriculum as a docile learner and the sect that advocated child-centered curriculum to accommodate an active learner. Dewey pointed out how the child's experience already contains elements of formal study. Compromise can be reached by interpreting academic studies as an outgrowth of the child's life, by integrating the child's experience with the subject matter.

To do this, Dewey (1915) suggested hands-on learning, or experiential curriculum, in which learning is built around a topic or idea, showing the relationships of the disciplines. Dewey proposed a hands-on, project-oriented curriculum built around the child's interests. Dewey also advocated natural language use in a social context for expression of thoughts rather than rote recitation of lessons.

Dewey wanted "the school to be a place in which the child should really live, and get a life experience in which he should delight in meaning for its own sake" (p. 59).

Dewey's views have frequently been misinterpreted as permissive and anti-intellectual. His perspective, however, according to Bunting (1987), involves rigor and relevance. It goes beyond content and incorporates thinking.

In spite of Dewey's influence on education, schools today tend to be organized around fragmented curriculum although there is a move toward integrated curriculum. The move toward child-centered integrated curriculum in the 1980's is due in part to the influence of cognitive psychology which views the learner as active and social (Moss, 1990; Schuell, 1986).

Philosophy of Integrated Curriculum

Some of the philosophy behind integrated curriculum involving cognitive psychology has already been discussed in the introduction of this paper. In review, children are actively involved in learning and learn best when they control their own learning. People learn by associating new learning with old,

adjusting schema appropriately. Learners are constantly formulating and testing hypotheses, seeking meaning and connections.

Kovalik (1986) states that "learning is the acquisition of useful programs" (p. 20). The mind recognizes patterns, remembering them if they are useful or if they incite creativity or emotion. It is the learner who determines which patterns will be retrieved or lost (pp. 20-22).

Because it is the learner who determines what information is useful or meaningful, a related philosophy of integrated curriculum is the child as the central focus. Children learn best when learning has personal meaning, when questions and concerns originate with them. In some types of integrated curriculum children have opportunities to initiate and choose their own activities (McClure, 1982; Pappas et al., 1990).

The role of teachers, then, is as a guide and facilitator. Teachers plan experiences, interact with students, and arrange the environment for maximum active learning (Schwartz, 1983; Southgate, 1973). Teachers view themselves as professionals who develop a program rather than following textbooks (Pappas et

al., 1990). This sort of teacher involvement promotes student achievement (Veach & Cooter, 1986).

In addition to a child-centered philosophy, the philosophy of most integrated curriculum states that language is understood and used according to social contexts. Language, therefore, is learned through actual use, not through skill and drill worksheets (Pappas et al., 1990). Often children work together as a community of learners to provide a more social context in integrated programs.

Because language processes--reading, writing, speaking, and listening--are learned by using them in meaningful situations, language must be natural, authentic, and meaningful. Students do this in an integrated curriculum by learning content while using language processes (Anderson, 1984; Gambell, 1987; Goodman, 1986; Harp, 1989; Pappas et al., 1990; Tovey & Wieble, 1981).

Children need to understand the functional importance of reading--as a pursuit of knowledge. This is best done when reading is integrated with other curriculum (McClure, 1982). One way to provide meaningful reading experiences is through literature. The value of literature has been discussed previously.

In summary, literature provides meaningful experiences, promotes aesthetic values, motivates students, and provides information (Handbook for Planning an Effective Literature Program, 1987).

Knowledge of the process of reading supports using literature as a primary resource in integrated curriculum. Reading requires one to activate schemata in order to comprehend (Goodman, 1986; Harp, 1989; Moss, 1990; Pappas et al., 1990). "Readers predict, select, confirm, and self-correct as they seek to make sense of print" (Goodman, p. 38). Reading literature allows children to build content schemata in a wide variety of ways as well as develop their reading ability.

Not only does knowledge about reading support integrated curriculum, but knowledge of the development of writing also supports integrated curriculum. Writing is a process in which children need time, ownership, and response (Harp, 1989). In a holistic, integrated program children write for meaning. Conventions are learned through producing and revising one's writing (Goodman, 1986; Graves, 1983; Harste, Short and Burke, 1988; Moss, 1990; Pappas et al., 1990). Langer (1986), in a study

comparing students' writing in completing short answers, taking notes, and writing essays found that children integrate meaning and think more when writing in essay form.

In addition to reading and writing, oral language is important. Oral language is the way children first learn language. Development of oral language affects development of other language processes (Heath, 1983).

Buckley (1986), in describing the work of teachers who began to integrate the language arts, lists ten statements the teachers wrote supporting integration. These are summarized below as they illustrate the philosophy supporting integrated curriculum.

1. Language is the primary means of creating and communicating knowledge.
2. The four language processes are interrelated and interdependent.
3. Oral language is the primary language process.
4. Writing is the most difficult because it requires clear thinking and control of mechanics.

5. Literature is the best model. Internalizing literature is more valuable than direct instruction.
6. One can only learn language by using it.
7. Skills should be learned in the context of purposeful information.
8. Teachers can best evaluate through observation of students.
9. The classroom needs to be well-controlled.
10. Integrated curriculum comes from teachers and students, not texts.

In summary, integrated curriculum is based on cognitive theories of schema and active, holistic learning. It is child centered and provides meaningful reading, writing, and oral language opportunities.

Types of Integrated Curriculum

Educators offer a variety of definitions and styles of integrated curriculum. Relationships among parts may be teacher or student initiated. Content matter may be based on curricular areas or on other ideas. Emphasis differs for different types of integration and terminology is sometimes interchangeable.

Good (cited in Shoemaker, 1989), defines integrated curriculum as "a curriculum organization which cuts across broad subject matter lines to focus upon comprehensive life problems or broad areas of study that bring together the various segments of the curriculum into meaningful association" (p. 2). Integration may be provided by the teacher or students may be encouraged to seek connections and ways of organizing information.

Busching and Lundsteen (1983) describe three basic types of integrated curriculum: nonsubject-based curriculum, broad fields curriculum, and interdisciplinary.

Nonsubject-based curriculum is built around "human activities and concerns, rather than skill sequences" (Busching & Lundsteen, 1983, p. 7). An example of nonsubject-based curriculum is the experience curriculum of John Dewey (1915). In nonsubject-based curriculum societal functions or current social problems, rather than traditional disciplinary content, are the center of focus and organization.

Shoemaker (1989) describes some types of nonsubject-based curriculum: holistic approach, using

all mind/brain functions approach, and integrative brainwork. Shoemaker describes a holistic approach as one that involves the whole child--cognitively, physically, spiritually, and affectively. In addition, holistic approaches start with the big picture first.

The using all mind/brain functions approach, according to Shoemaker (1989), focuses curriculum on thinking, feeling, physical-sensory, and intuitive functions of the mind. The third type of nonsubject-based curriculum listed by Shoemaker is integrative brainwork, which involves seeking or creating meaning and organization by the individual.

Biestman (1975) also advocates an integrated curriculum based not on content, but emphasizing the child's personal experience. The most important thing to Biestman is allowing children to express themselves through several media--listening, art, oral and written language, fantasy, and movement.

The second type of integration described by Busching and Lundsteen (1983) is the broad fields approach. In this approach naturally related subjects, such as the language arts, are unified. Busching and Lundsteen warn that some programs labeled

integrated may be little more than several "pasted together" (p. 5) activities on related subjects with no thread of discovery or purposefulness.

Tanner and Tanner (1975) see the broad fields approach a little differently. For them, the goal is not putting broad fields together, but understanding the relationships between them.

A third type of integration is interdisciplinary, according to Busching and Lundsteen (1983). In this approach the scope and sequence of one discipline is attached to skills and concepts of other disciplines. One discipline is the principle organizer, the others are vital, but supplementary.

Berg's (1989) definition of integrated curriculum fits this third model. Berg defines it simply as "curriculum development effort in which two or more previously separate subjects are combined" (p. 38).

Roehler (1983) provides a more detailed definition: "Integration is a strategy for intentionally combining subject matter so that students are aware of this integration during implementation" (p. 28). To Roehler there are two basic elements of this curriculum--knowledge base of the culture and language strategies that carry that

information. Teachers can combine known learning and new learning of these two elements in various ways to achieve successful integration.

Gilbert (1987) uses different terminology to further describe types of integration. Gilbert divides integration into four types. The first type Gilbert calls interdisciplinary programs in which the teacher initiates the relationship between the parts, but not to the whole. Connections are superficial and the teacher is the source of information.

The second type is core curriculum. This type has heavy academic emphasis in three or four basic areas. Again, relationships between parts are initiated by the teacher (Gilbert, 1987).

The third type described by Gilbert (1987) is activity-based integration. This is more student focused. Skills and processes are considered along with subject matter content, but the whole is not complete. The activity-based curriculum includes nonacademic areas with an emphasis on problem solving rather than rote knowledge. The teacher is the facilitator.

The fourth type Gilbert (1987) labels as integrated curriculum. The emphasis here is process.

The teacher facilitates and students make connections. Emphasis is on the right questions rather than the right answers. Students use and apply knowledge.

The degree of this type of integration varies. Anderson (1984) describes different degrees or levels of integration, depending on the point of transition from traditional instruction to whole language instruction. The more a classroom is whole language oriented the more integrated the instruction.

In a whole language model learning is centered on the process of comprehending. Learning is child centered and language based. One of the characteristics of a whole language classroom is integration of speaking, listening, writing, reading, and content. Anderson (1984) acknowledges that no one blueprint or model for an integrated whole language classroom exists.

Some educators are not comfortable with a pure whole language approach. Cooter and Flynt (1989) describe a program that integrates whole language and direct instruction. This approach uses instruction in basal readers, shared reading, direct phonics instruction, and frequent sustained silent reading.

Still other ways to integrate curriculum exist. Gambell (1987), in a report for the Saskatchewan Department of Education, suggests developing an integrated curriculum that integrates language, or communication, throughout all areas of the curriculum. In this approach, language learning and usage is combined with each content area, but the content areas are kept separate and distinct from each other.

Pitman (1986) also describes ways to integrate language arts into the curriculum. These are: (1) language arts projects, such as a school newspaper; (2) reading-centered curriculum, in which activities are integrated around literature, such as a book, play, or poem; (3) communication-centered projects, such as media comparisons; (4) language-centered curriculum, built around conceptual statements such as "language changes from situation to situation" (p. 33); (5) theme centered curriculum, built around a broader topic; and, (6) interdisciplinary curriculum, which is like the theme centered except other subject areas are incorporated.

These are some of the ways curriculum can be integrated. The remainder of this chapter will

address one of those ways, thematic units, in more detail.

Thematic Units

Several educators support the theme-centered approach mentioned by Pitman (1986). McClure (1982) explains that thematic units are based on a central idea which relies on the theme for material. Focus is on developing the students' ability to gain meaning from all types of print.

In the thematic unit described by Ferguson (1988), teachers and students work together to plan activities. Literature is used rather than text books. Activities include shared reading, sustained silent reading, chanting, singing, and dramatic reading.

Pappas et al. (1990) expand on this idea. They portray a thematic unit with opportunities to explore in depth specific topics or domains by providing choices and sustained time to pursue activities. They explain that thematic units

> reflect patterns of thinking, goals, and concepts common to bodies of knowledge. They link together content from many areas of curriculum and depict

> connections that exist across disciplines. Thematic units provide a framework for a community of learners in which all children can continue to learn language and to construct knowledge (p. 49).

A thematic unit can be constructed around a topic, a type of literature, works of an author or illustrator, or even around a single novel. Most importantly, the "aim of any thematic unit is to provide context for meaning making" (p. 50).

Kovalik (1986) builds a thematic unit using one broad conceptual year-long theme with nine major components--past, present, future, art, music, literature/drama, careers, famous people, and political action--one for each month of the year. In this format the teacher writes, based on Blooms' taxonomy, inquiry statements for each component. Students choose inquiries to research and present to the class using their preferred mode of learning. The thematic unit concept is based on a classroom with trust, cooperative learning, a variety of methods and materials, and time to process and respond to information.

According to Anderson (1984), thematic units are "the highest level of teacher development and proficiency and of student learning" (p. 546) because all language processes are integrated and internalized and language is used naturally for communication.

The first step in planning a thematic unit is choosing a theme. Themes can come from content in curriculum guides and from student interests. They should be broad enough to incorporate many types of books and materials, yet narrow enough students will not lose sight of connections (Pappas et al., 1990).

In addition to these two sources Rhodes and Dudley-Marling (1988) propose that the teacher can also choose any topic which may inspire students and meet some of their needs.

Shoemaker (1989) points out two approaches to thematic units. Themes may be topic centered or concept centered. An example of a topic is 'dinosaurs' as opposed to the concept 'extinction'. According to Kaplan (cited in Shoemaker), topic centered themes stifle possibilities but concepts widen possibilities for choices, thinking, and activities. Themes should be related to a discipline,

significant to study, and contain a variety of teaching and learning options.

Ferguson (1988) also has suggestions for choosing a theme. It might be based on the children's needs, interests, and abilities. Curriculum goals and sometimes parents can help determine a theme as well. Themes may focus on a culture, region, or resource.

Baskwill (1988) argues that a good theme will be rich in literature, including fiction and nonfiction, will have natural links to curriculum, and will be provided with ample time. Kucer (1989) also lists characteristics of a good theme, suggesting that themes need to move beyond a simple topic to concepts or ideas so children will see connections between those ideas, not just activities on a related topic.

After selecting a topic the next step is to brainstorm and organize information. There is no one correct way to do this. Pappas et al. (1990) advise listing all materials, activities, and concepts, then organizing them into categories.

Another way to organize the information is by subject area if the teacher wants to make sure each subject area is covered (Corwin, Hein & Levin, 1976).

Rhodes and Dudley-Marling (1988) also advocate categorizing, or webbing, but while involving the students, having them brainstorm what they want to know. Categories conceived can later be used for interest grouping. Norton (1977) specifies how this can be done. Norton suggests choosing a theme, then, with the children, making a web that lists subtopics. Children form interest groups based on their choice of a subtopic, research it, and in some creative way present the information they find to the class.

Ferguson (1988) mentions that brainstorming also is a way to integrate speaking, reading, and writing as the teacher records students' thoughts. Another advantage is that the teacher can evaluate what students know while observing students brainstorm.

Taking this concept into more detail, Harste et al. (1988) recommend involving the students in a theme cycle. In this cycle, students make lists of things they know about the topic, things they want to know about the topic, and students and teacher together list resources--books, places, and people--where they can go for information. The teacher writes students' ideas on charts. Through various individual and group activities children search for the information and

present their findings in some way. The class completes and continues the cycle by listing "what we know now", and "what we want to know next" (p. 367).

No matter how the information is organized, the third step is to gather materials. Rhodes and Dudley-Marling (1988) believe this is primarily the teacher's responsibility, although students may help.

Gathering materials that include a variety of types of resources provides maximum exposure to concepts. The difficulty of the material should be appropriate for the students' reading and listening levels (Rhodes & Dudley-Marling).

The more types of resources, the better. Hart (1978) explains that the brain seeks patterns on its own. In instruction, it is quantity of information, not order, that helps children find those patterns. The more methods and materials teachers use the more students can learn. Different individuals will make sense of the information in their own way.

Teachers may use subject guide books of children's literature to find children's books on the theme. To provide children with a wide variety of experiences, fiction and nonfiction should be included, incorporating read-aloud materials, multiple

sets of books for group reading, extra books and magazines for personal choice reading, hands-on materials, community resources, and artistic resources (Pappas et al., 1990). Among the many resources, literature holds a central position.

The fourth step in planning a thematic unit is planning activities. These will include a variety of purposeful oral and written activities and other activities involving language. The activities may lead to books or may be a follow-up to books read. (Pappas et al., 1990).

Moss (1990) encourages dialoging before, during, and after reading. Dialogue before reading helps children bring their prior knowledge to the literature, facilitating comprehension. This dialogue could take the form of the teacher asking pertinent questions in order to start the students thinking about the content or theme of the story and having children make predictions about the story based on its title, pictures, or other elements.

During the reading the teacher may stop to have the children predict, interpret, or otherwise discuss the story. Children also may interrupt with comments or questions (Moss, 1990).

After the reading, the teacher may ask questions about the story, helping the children to make connections, evaluate, confirm prior predictions, discuss story elements, and so on. To further extend the literature experience, an ongoing dialogue about the literature may be kept in a dialogue journal between the teacher and student, or through individual conferences (Moss, 1990).

Similarly, Kucer (1989) deals with literature in a thematic unit with an into, through, and beyond format. Into activities generate information or focus information on the ideas of the literature to be read. Activities taking students into the literature may include reading related material, discussing concepts, watching filmstrips, or any other activity that focuses attention and activates schemata.

Activities through the literature help students read or write. Kucer (1990) describes this as a discussion of the story, including what students liked, disliked, would like to change, and understandings or misunderstandings.

Activities beyond the literature extend the reading experience, helping students apply and integrate the information. These may be any

activities, including music, art, other literature, and so on. The beyond activity may be the into activity for the next piece of literature encountered.

Another activity that might be used for any part of an into, through, or beyond lesson is a journal. Simmons (1989) explains the value of a journal in a thematic unit. The concepts of the unit provide natural writing topics and unit activities provide stimuli for writing. A journal need not only address literature, but also could address related controversial topics or any related idea.

In any case, lessons and activities the teacher plans "should be considered as a point of departure rather than cast in stone" (Rhodes and Dudley-Marling, 1988, p. 94). The students and teacher will generate new ideas and lessons as they go through the unit.

In a thematic unit, grouping is flexible and temporary (Anderson, 1984). Students may be grouped in cooperative groups, which are arranged by the teacher for collaborative activities, usually with the more able helping the less able. They might organize into interest groups, based on choice of a project or item of study. The teacher may also choose to put the children in temporary skill groups in which all

children need instruction on one skill. However, when students are not grouped by skill they generally seem to achieve beyond expectations (Ferguson, 1988).

After planning activities, and possibly sharing them with the children, the teacher's job is to arrange the classroom furniture and equipment to implement the unit. The students choose one project to do, either alone or with a group. At the end of the unit the students share their project with the class (Pappas et al., 1990).

Rhodes (cited in Anderson, 1984) mentions eight guidelines, summarized below, for a teacher to consider when planning a unit.

1. Who is the unit for? Consider age level and interests.
2. What is the time frame?
3. What is the topic?
4. In the unit being adapted from another unit or is it from scratch?
5. What are the concepts children should know?
6. What are the language attitudes and abilities the teacher wants children to learn through the unit?
7. What activities will be included?

8. What resources are available? Resources can include books, films, pictures, texts, and community people, artifacts, and activities.

In summary, there is no one way to plan and implement a thematic unit. Each teacher must use professional judgment and personal level of comfort when involving children in decision making and planning. Some general guidelines include choosing appropriate topics, including a variety of literature along with other resources, and providing some choices for children.

Conclusion

The review of the literature on integrated curriculum and thematic units indicates that integrating language and content areas can provide for maximum, meaningful, and efficient learning of both language and content. Integrated curriculum is not new; over the years educators have described and developed many different types, forms, and levels of integration, including the thematic unit. Although there is no one correct way to write a thematic unit, some general guidelines do exist which may help teachers plan and implement a unit effectively.

Proposed Project

The project proposed in this paper includes three thematic units, using topics from the content area of science as a primary thematic organizer, with activities from the other disciplines under that topic. Reading, writing, listening, and speaking are used in natural contexts for meaningful purposes. Connections are made by the teacher and by students.

The thematic units enclosed are built on concepts. Literature is a primary source, with a variety of other resources included. Activities are mapped by subject area. The into-through-beyond method described in the review of the literature is the organizing component of the lessons.

Goals and Limitations

Goals

The first goal of these thematic units is to teach more content and language in a given time. This will be done by integrating science, language arts, art, music, social science, and occasionally other curricular areas, such as math.

The second goal is to prepare students for future careers and social life by developing their communication and thinking skills using methods supported by cognitive theories of learning. Students will be encouraged, as active learners, to draw conclusions and share that information with others. They will work together often because learning is a social activity. Because reading, writing, speaking, and listening will be interrelated and will be used for meaningful purposes, students' reading and writing performance and conceptual understanding will improve.

In addition, students will acquire values and develop higher level thinking skills through their acquaintance with large quantities of diversified literature. Concept attainment will be facilitated through use of literature, providing different perspectives on content information, and different

styles of transmitting knowledge. Exposure to literature will also increase reading and writing performance because literature serves as a model for writing and acquaints students with story structure.

Lastly, enjoyment of literature, integration of material, working with others, and having choices will increase students' motivation to read and to participate in learning activities.

Limitations

The thematic units proposed do not fit the experience approach as proposed by Dewey. The units provide activities, but students do not choose large, overall projects from which they learn all needed concepts.

Instead of Dewey's experience approach, the units are centered around subject areas. The thematic units are topic centered rather than concept centered, although concepts within the topic are identified. This author chose topics--plants, weather, and teeth, as opposed to broader concepts, such as growth, change or conservation, because subject area topics are easier to bring into conformity with school district curricular objectives. Also, with topical

organization, concepts and ideas under the topic are easily organized and evaluated.

The units in this project do not attempt to involve children in the planning because this cannot be thoroughly done without children present. The units do, however, provide some choices for children in terms of ways to present information. Because children did not participate in the writing of the unit, the activities are not meant to be the only way to implement the unit. When done with children, they will change and develop according to the children's and teacher's interests and ideas.

In addition, the units do not address reading and writing strategy instruction. Because children need reading and writing strategy instruction, each teacher using the units may determine specific reading and writing strategy needs of that particular class and address those in context of the unit.

Furthermore, the units do not attempt to involve all information that children need to know in all curricular areas. Only applicable math, social studies, or other curricular areas are included. Other concepts and information would probably be

taught at another time outside of the unit instructional time.

Although the units may be adapted for other grade levels, they are designed for grade two.

Evaluation

Traditional means of evaluating students--standardized tests, basal, and other tests that break down reading and writing into skill sequences are not in line with the current philosophy of reading and writing (Busses & Chittendon, 1987; Pearson, 1988; Teale, Hiebert & Chittendon 1987; Valencia & Pearson, 1987). Pearson states, "Reading, with its strong creative, imaginative, interpretive and individualistic elements is not an activity which lends itself to measurement...The only way to assess reading is to examine reading itself, not some manifestation of it" (p. 159).

Although skill sequenced tests may be mandatory in school districts, this author does not recommend those tests in this project. Instead, evaluation will follow certain guidelines that are in tune with a more holistic point of view, as described in the review of the literature.

Routman (1988) points out that even with standardized tests, ongoing informal observations are needed to get a clear picture of a child's progress. The California English-Language Arts Framework (1987) states that "although objective tests are clearly

easier to administer, less expensive, or more quickly scored, they can measure only a small portion of what children learned and understood" (p. 35). Dyson (1987) further argues that children differ in the sequence and the speed in which they learn. Because children differ in focus they cannot be measured by a single standard.

Explaining this issue further, Teale, Hiebert and Chittendon (1987) differentiate between testing and assessment. They define testing as one particular method of evaluation whereas assessment is a variety of less formal methods of evaluation. Assessment is more accurate and more valuable. They list six qualities of assessment:

1. Assessment is part of instruction....
2. Assessment focuses on a broad range of skills and knowledge reflecting various dimensions of literacy....
3. Assessment occurs continually....
4. Literacy occurs continually....
5. Literacy is assessed in a variety of contexts....

6. Measures are appropriate for children's developmental level and background. (pp. 772-777).

Teale, et al. (1987) list areas that are important to assess. These are: concepts about functions and conventions of literacy, comprehension, emergent reading of storybooks, knowledge and use of writing systems, and composing.

Pappas et al. (1990) further illustrate this concept of assessment. In assessment, children are evaluated in context. "Assessment and curriculum are fused" (p. 321). To fuse curriculum and assessment children should be evaluated on three things: the level of development a child has reached in various aspects of learning, the attempts the child has made to learn, and what a child has mastered. Rather than focusing on children's weaknesses, holistic evaluation focuses on behaviors that demonstrate understanding and progress.

Henry Pearson (1988) lists these guidelines for assessment.

1. Assessment procedures and instruments should reflect...not determine the curriculum.
2. Assessment...should be child centered.

3. Assessment should involve a description of what children have achieved rather than a prescription of what a remote body thinks children should achieve.
4. The main intention of the curriculum, the methods and the assessment strategies should be to improve the quality of children's education (p. 158).

Adhering to these guidelines, in the enclosed thematic units children will be informally assessed through the following means: cumulative portfolios, reading miscue analysis or modified miscue analysis, learning logs, and teacher/student conferences.

Pearson (1988) refers to a cumulative portfolio as album assessment. Graves (1983) simply calls it a folder. Whatever its name, the portfolio is an ongoing collection of student writing samples. Writing samples are dated and may be selected by the teacher or the student to be included in the folder. The folder may also include lists of books read, projects, reports, posters, photocopies of journal articles, and anecdotes regarding student progress (Baskwill & Whitman, 1988). These notes might be written by the teacher, student, parent, or any adult

working with the child. Notes regarding student attitudes, responses, or strategies could be included (Pearson).

Rhodes and Dudley-Marling (1988) suggest writing anecdotes based on observations of students as they are writing and silently reading. During silent reading the teacher may make notes about a student's level of concentration, reluctance to stop, spontaneous reactions to material read, type of material selected, including difficulty level, and impatience with disturbances.

Teachers can make observational notes about writing as well (Rhodes & Dudley-Marling, 1988). Two questions to ask are: "Does it fulfill the intended purpose?" and "Does it show knowledge about conventions that help meet that purpose?" (p. 49). Some things to consider when observing student writing are: whether the teacher or the child initiated the writing and chose the topic; time the student was allowed; any speaking the child does while writing; the student's body language while writing; and the purpose, coherence, words, language structure, and mechanics of the writing.

Pappas et al. (1990), recognizing the difficulty of noting progress of all children, suggest periodically targeting certain children to observe so as to have notes about everyone in class. When observing writing, teachers might take notes on how children spell, use space, form letters or words, and make changes and corrections. Teachers can observe children's progress by assessing writing samples in the portfolio over time.

Along with anecdotes and work samples, a checklist might be included in a portfolio. Pearson (1988) points out two problems with checklists. Students may master a skill in one situation and not in another and checklists are prescriptions of how someone thinks a student ought to behave, rather than a description of existing behaviors. However, checklists do have value for summing up information included in the portfolio (Pappas et al., 1990).

Another method used to evaluate students' reading will be the reading miscue inventory or the modified miscue analysis. Miscue analysis was originally developed by Ken Goodman (1979), but is too time consuming for general use in the classroom. Pappas et al. (1990) present a modified miscue analysis

including a coding sheet for analyzing results (pp. 191-193). Baskwill and Whitman (1988) also present an easy-to-use recording checklist (p. 20).

According to Pappas et al. (1990), a miscue is "a deviation or difference between a reader's production and the text when the reader is reading aloud" (p. 188). In the miscue analysis procedure the teacher selects a literary text new to the child. As the child reads the text aloud, the teacher tape records the child's reading. After the reading, to assess comprehension, the teacher asks the child to retell the story. If the child's retelling is too brief to determine if the child understood the passage, the teacher may ask prompting questions that do not provide information about the material (Goodman, 1979).

Goodman (1982) explains that although retelling does not guarantee the reader will fully represent all that was comprehended, it does provide information. The person doing the miscue analysis must keep in mind the influence of the level of language development, dialect, and the child's background knowledge, both of experience and of literature, as these will affect the child's understandings and retellings.

As the child reads, or at a later time while listening to the tape recording, the teacher marks another copy of the text, using a code for types of oral reading miscues the child made, such as substitutions or omissions. The teacher can then analyze those miscues to determine strengths and weaknesses of the child's reading.

Miscues that do not result in loss of meaning are not considered a problem (Baskwill & Whitman, 1988; Goodman, 1979; Rhodes and Dudley-Marling, 1989; Pappas et al., 1990,). "The quality of the miscues and their effect on meaning are the central concepts" (Goodman, p. 4).

A third way of evaluating students will be learning logs. Learning logs are some type of notebook in which students daily record things they have learned, including understandings, questions, or confusing items. Each entry is dated, which helps an observer monitor progress. Learning logs may be specifically subject oriented, such as a science log or literature log, or they may be general (Harste et al., 1988).

For these units a general learning log will be used in which students can record in writing something

about the learning of each day. The teacher may need to prompt writing with prior discussion or questions such as "What did you understand?," "What didn't you understand?," or "What do you know now that you did not know before you came to school this morning?" (Harste et al., 1988, p. 187).

Learning logs give students control of their own learning, require them to think while writing, and encourage self reflection (Pappas et al., 1990). Because "it is children who do the learning, it makes sense to teach them to be self evaluative" (p. 324). The teacher may ask students, in addition to stating what they learned, to evaluate themselves on effort, group cooperation, and their feelings about the information learned. Routman (1988) believes that self-evaluation is the "highest level" (p. 218) of evaluation.

If the teacher senses that information is still needed and time permits, the teacher may have a conference with students, either in small groups or individually. In this conference the teacher and the student will discuss the content of the unit because content and language are fused. The teacher can

evaluate the child's knowledge of the content as well as oral skills (Pappas, et al., p 321).

Teachers might evaluate reading strategies in an interview as well. Wixson, Bosky, Yochum and Alvermann (1984) developed a Reading Comprehension Interview (RCI) with fifteen questions that provide insight into the reader's comprehension strategies.

Although the thirty minutes required for this one-on-one interview would be too time consuming for use with a whole class, and the interview is designed for students third grade and older, a teacher of the following units may wish to use some questions or ideas from the RCI to gain insights into reading comprehension strategies. "What is the most important reason for reading this kind of material?," "Who's the best reader you know?," and "What makes him/her a such a good reader?" (p. 348) are some questions that would quickly provide insight into a second grader's reading strategies.

In conclusion, evaluation will be holistic, informal, and ongoing. Specific evaluation will be done through student portfolios containing student work, teacher anecdotes, and a cumulative checklist;

modified miscue analysis; learning logs; and individual student/teacher conferences.

References

Anderson, G. S. (1984). A whole language approach to reading. Lanham, MD: University Press.

Anderson, R. C. (1977). The notion of schemata and the educational enterprise: General discussion of the conference. In R. C. Anderson, R. J. Spiro & W. E. Montague (Eds.), Schooling and the Acquisition of Knowledge (pp. 415-431). Hillsdale, NJ: Lawrence Erlbaum Associates.

Barnes, H. L. (1987). The conceptual basis for thematic teacher education programs. Journal of Teacher Education, 38(4), 13-18.

Barr, M. A. (1988). Implementing a research-based curriculum in English-Language Arts, K-12. Pacific Grove CA: State Staff Development and Curriculum Conference.

Baskwill, J. (1988). Themestorming. Teaching K-8, 19, 80-82.

Baskwill, J., & Whitman, P. (1988). Evaluation: Whole language, whole child. New York: Scholastic.

Berg, M. (1989). The integrated curriculum. Social Studies Review, 28(1), 38-41.

Biestman, M. S. (1975). Teaching children to integrate language experiences (preschool--third grade). San Francisco: Far West Laboratory for Educational Research and Development. (ERIC Document Reproduction Service No. ED 129 460)

Brountas, M. (1989). Using the thematic approach. Teaching K-8, 19(8), 53-55.

Brozo, W. G., & Tomlinson, C. M. (1986). Literature: The key to lively content courses. The Reading Teacher, 40, 288-293.

Boyer, E. L. (1982). Seeing the connectedness of things. Educational Leadership, 39(8), 582-584.

Buckley, M. F. (1986). When teachers decide to integrate the language arts. Language Arts, 63, 369-377.

Bunting, C. E. (1987, October). Educational purpose and the new curricula: A view from the theoretical perspective. NASSP Bulletin, 71(501), 119-125.

Busching, B. A., & Lundsteen, S. W. (1983). Curriculum models for integrating the language arts. In B. A. Busching & J. I. Schwartz (Eds.), Integrating the language arts in the elementary

school (pp. 3-27). Urbana, IL: National Council of Teachers of English.

Bussis, A. M., & Chittenden, E. A. (1987). Research currents: What the reading tests neglect. Language Arts, 64, 302-308.

Clem, C., & Feathers, K. M. (1986). I lic spidrs: What one child teaches us about learning. Language Arts, 63, 143-147.

California State Department of Education. (1987). English-language arts framework. Sacramento: Author.

California State Department of Education. (1987). Handbook for planning an effective literature program. Sacramento: Author.

California State Department of Education. (1988). History social science framework for California public schools: Kindergarten through grade twelve. Sacramento: Author.

Cooter, R. B., & Flynt, E. S. (1989). Blending whole language and basal reader instruction. Reading Horizons, 29(4), 275-282.

Corwin, R., Hein, G. E., & Levin, D. (1976). Weaving curriculum webs: The structure of nonlinear curriculum. Childhood Education, 52, 248-251.

Dewey, J. (1902). The child and the curriculum. Chicago: University of Chicago Press.

Dewey, J. (1915). The school and society. Chicago: University of Chicago Press.

Dyson, A. H. (1987). Individual differences in beginning composing. Written Communication, 4, 411-441.

Ferguson, P. (1988). Whole language: A global approach to learning. Instructor, 97(9), 25-27.

Gambell, T. J. (1987). Communication across the curriculum: A common essential learning for Saskatchewan students. A study completed for Saskatchewan education core curriculum investigation project. Summary paper. Regina: Saskatchewan Department of Education. (ERIC Document Reproduction Service No. ED 286 221)

Gilbert, J. C. (1987). Interdisciplinary learning: A resource guide. A small place to begin. Denver: Colorado State Department of Education. (ERIC Document Reproduction Service No. ED 294 189)

Goodman, K. (1979). Miscues: Windows on the reading process. In K. Goodman (Ed.), Miscue analysis: Applications to reading instruction (pp. 3-14).

ERIC clearinghouse on reading and communication skills, Urbana, IL: National Council of Teachers of English.

Goodman, K. (1986). What's whole in whole language?. Portsmouth, NH: Heinemann.

Goodman, Y. (1982). Retellings of literature and the comprehension process. Theory Into Practice, 21, 301-307.

Graves, D. H. (1983). Writing: Teachers and children at work. Exeter, NH: Heinemann Educational Books.

Harp, B. (1989). When the principal asks: "How are we using what we know about literacy processes in the content areas?". The Reading Teacher, 42, 726-727.

Harste, J. C., Short, K. G., & Burke, C. (1988). Creating classrooms for authors. Portsmouth, NH: Heinemann.

Hart, L. A. (1978). Brain-compatible teaching. Today's Education, 67(4), 42-45.

Heath, S. B. (1983). Research currents: A lot of talk about nothing. Language Arts, 60, 999-1007.

Hunkins, F. P. (1982). Splintering the curriculum. Educational Forum, 46, 193-201.

Keitz, R. (1987). Integrating curriculum for tomorrow's students. Educational Leadership, 44(4), 69-70.

Kovalik, S. (1986). Teachers make the difference. San Jose, CA: Discovery Press.

Kucer, S. B. (1989). Integrating the curriculum for better learning and teaching. Thirteenth Annual Reading Conference Proceedings (pp. 27-42). San Bernardino, CA: CSUSB Reading Conference.

Langer, J. A. (1986). Learning through writing: Study skills in the content areas. Journal of Reading, 29, 400-406.

McClure, A. A. (1982). Integrating children's fiction and informational literature in a primary reading curriculum. The Reading Teacher, 35, 784-788.

McCutcheon, G. (1978). The curriculum: Patchwork or crazy quilt. Educational Leadership, 36(1), 114-116.

Melle, M., & Wilson, F. (1984). Balanced instruction through an integrated curriculum. Educational Leadership, 41(7), 59-63.

Moss, J. F. (1990). Focus on literature: A context for literacy learning. New York: Richard C. Owen Publishers.

Nelms, B. F. (1987). Response and responsibility: Reading, writing, and social studies. The Elementary School Journal, 87, 571-589.

Norton, D. (1977). A web of interest. Language Arts, 54, 928-933.

O'Brien, K. (1988). Using children's literature in the history-social studies curriculum. Social Studies Review, 28(1), 53-62.

Pappas, C. C., Kiefer, B. Z., & Levstik, L. S. (1990). An integrated language perspective in the elementary school. New York: Longman.

Pearson, H. (1988). The assessment of reading through observation. Reading, 22, 158-163.

Pitman, J. D. (1986). Language arts resource guide K-12. Providence: Rhode Island State Department of Education. (ERIC Document Reproduction Service No. ED 283 144)

Poincaire, H. (1952). Science and Hypothesis (W. J. G, Trans.). New York: Dover Publications. (Original work published 1938)

Postman, N. (1980). The ascent of a humanity: A coherent curriculum. Educational Leadership, 37(3), 300-303.

Rhodes, L. K., & Dudley-Marling, C. (1988). Readers and writers with a difference: A holistic approach to teaching learning disabled and remedial students. Portsmouth, NH: Heinemann.

Roehler, L. R. (1984). Ten ways to integrate language and subject matter. In B. A. Busching & J. I. Schwartz (Eds.), Integrating the language arts in the elementary school. (pp. 28-34). Urbana, IL: National Council of Teachers of English.

Rickards, J. P., & August, G. J. (1975). Generative underlining strategies in prose recall. Journal of Educational Psychology, 67, 860-865.

Routman, R. (1988). Transitions. Portsmouth, NH: Heinemann.

Rudman, M. K. (1983). Helping children to find themselves and each other in books. In B. A. Busching & J. I. Schwartz (Eds.), Integrating the language arts in the elementary school (pp. 123-132). Urbana, IL: National Council of Teachers of English.

Postman, N. (1980). The ascent of humanity: A coherent curriculum. Educational Leadership, 37(3), 300-303.

Rhodes, L. K., & Dudley-Marling, C. (1988). Readers and writers with a difference: A holistic approach to teaching learning disabled and remedial students. Portsmouth, NH: Heinemann.

Roehler, L. R. (1984). Ten ways to integrate language and subject matter. In B. A. Busching & J. I. Schwartz (Eds.), Integrating the language arts in the elementary school. (pp. 28-34). Urbana, IL: National Council of Teachers of English.

Rickards, J. P., & August, G. J. (1975). Generative underlining strategies in prose recall. Journal of Educational Psychology, 67, 860-865.

Routman, R. (1988). Transitions. Portsmouth, NH: Heinemann.

Rudman, M. K. (1983). Helping children to find themselves and each other in books. In B. A. Busching & J. I. Schwartz (Eds.), Integrating the language arts in the elementary school (pp. 123-132). Urbana, IL: National Council of Teachers of English.

Schwartz, J. I. (1983). The child's search for meaning and language learning. In B. A. Busching & J. I. Scwartz (Eds.), Integrating the language arts in the elementary school (pp. 35-44). Urbana, IL: National Council of Teachers of English.

Shoemaker, B. J. (1989). Integrative education: A curriculum for the twenty-first century. OSSC Bulletin, 33(2). (ERIC Document Reproduction Service No. ED 311 602)

Shuell, T. J. (1986). Cognitive conceptions of learning. Review of Educational Research, 56, 411-436.

Simmons, J. (1989). Thematic units: A context for journal writing. English Journal, 78, 70-72.

Southgate, V. (1973). The language arts in informal British primary schools. The Reading Teacher, 26, 367-372.

Stott, J. C. (1987). The spiralled sequence story curriculum: A structuralist approach to teaching fiction in the elementary grades. Children's Literature in Education, 18, 148-162.

Tanner D., & Tanner L. N. (1975). Curriculum development: Theory into practice. New York: Macmillan.

Teale, W. H., Hiebert, E. H., & Chittenden, E. A. (1987). Assessing young children's literacy development. The Reading Teacher, 64, 772-777.

Tovey, D., & Weible, T. D. (1981). Extending social studies understandings through language arts. Social Education, 45, 367-369.

Tunnell, M. O., & Jacobs, J. S. (1989). Using "real" books: Research findings on literature based reading instruction. The Reading Teacher, 42, 470-477.

Valencia, S., & Pearson, D. P. (1987). Reading assessment: Time for a change. The Reading Teacher, 41, 727-732.

Veatch, J., & Cooter, R. B. (1986). The effect of teacher selection on reading achievement. Language Arts, 63, 364-367.

von Bracht Donsky, B. (1984). Trends in elementary writing instruction, 1900-1959. Language Arts, 61, 795-803.

Wittrock, M. C. (1986). Students' thought processes. In M. C. Wittrock (Ed.), Handbook of research on teaching: Third edition (pp. 297-314). New York: Macmillan.

Wixon, K. K., Bosky, A. B., Yochum, M. N., & Alvermann, D. E. (1984). An interview for assessing students' perceptions of classroom reading tasks. The Reading Teacher, 37, 346-352.

Appendix

Introduction to Thematic Units

The appendix of this project consists of three thematic units. They are built around the topics: plants, teeth and weather. The design and format of the thematic units is as follows: each unit begins with a rationale for studying the topic, followed by a list of concepts covered. Lessons are organized around one or more concepts. Each lesson is arranged in an into, through, and beyond format. Suggestions for culminating activities are included. The evaluation chapter of this project describes ways to evaluate students throughout the units.

In regards to time frame, the lessons vary. Some may take less than one day, some more. Each teacher and group of students using the unit may decide what amount of time is suitable for them.

The author has compiled a curriculum map at the end of each unit to help the teacher quickly see what subject areas are addressed.

Some of the units mention an author's folder. This is a folder in which students keep drafts of writing. Periodically students may select one rough draft to revise, edit, copy neatly or type, and illustrate.

The author expects that any teacher using these units will add, delete, change, and extend activities and ideas based on the teacher's and the children's ideas, preferences, interests, and needs.

Furthermore, teachers need not believe that they must have all the materials mentioned in order to use the units. Similar materials may be substituted or added.

Also, the number of children in a group may vary from the suggested number in the unit. Different sizes of groups may work better in various situations.

Although written with second grade in mind, these units may be adapted for other primary grades. Books listed vary in difficulty from beginning first grade to a third or fourth grade level.

The most important item to remember for any teacher wishing to use these units is that the activities and concepts are only suggestions that can be varied in many ways to fit the teacher and the children using them.

Plants

Rationale

Plants are the basic food source for animals and humans. They provide oxygen and many useful products as well as beauty. Plants sometimes need care from humans. Humans need to use plants wisely for the preservation of plants and of humanity. Students, therefore, need to learn to use, appreciate and care for plants. Students can learn the scientific skills of observing, hypothesizing and recording data while studying plants. Learning about plants and careers with plants may encourage students to choose science as a later occupation or hobby.

Concepts

1. Plants have different parts with different functions, each supporting the whole plant.
2. Plants are different from animals in that they make their own food.
3. Plants are affected by seasonal changes.
4. Plants should be appreciated because they have many uses, including food, and are necessary to life.
5. The way food from plants is brought to the consumer has changed over time.
6. People need to take care of plants, making sure they do not destroy plants that they may need.
7. There are many careers involving plant care and production.

Throughout the unit

* These books would be available for silent reading in addition to the books mentioned in the unit: The Magic Carrot Seed, The Village Tree, The Paper Flower Tree, The Tale of Peter Rabbit, and Johnny Appleseed.
* Students will write daily in a learning log.
* Students will keep their work in a folder to make a booklet about plants.

Lessons

1. Concept: **Plants have various parts and functions. Leaves make food. Plants are different from animals in that they make their own food.**

Into: Ask students to brainstorm everything they already know about plants. List these ideas on the chalkboard. Take a walk with students to observe plants. Students will take a pad of paper and draw or write the name of (if known) each kind of plant they see on their walk.

They will come back to the classroom and share information. Discuss which parts of the plants could be seen. Have available a flowering plant for the students to observe. The students will name and the teacher will

record the parts of the plants, listing them on the chalkboard--leaves, stem, flowers, and roots. If students do not think of it, ask them how most plants start growing. Add seeds to the list.

Ask students, "What is the difference between plants and animals?" Students will brainstorm ideas. Write them down. If no one mentions it, explain that the main difference is in the way they get their food. Animals have to get food outside their own body. Plants make their own food inside their leaves. Show a picture of a factory in Food from Farm to Family and explain that people bring something to the factory, such as milk from cows, in big trucks. Then they put the milk in containers or make it into cheese, yogurt, or ice cream. Trucks take it to the stores to sell it so people can eat it. Leaves are like a factory.

Through: Read to the students "The Food Factories," pages 14-18, from Plants do Amazing Things.

Beyond: Make a list with the students of all the things the books said plants need--water,

sun, carbon dioxide, and usually, soil. With the class create a chart comparing a factory to a leaf. A finished chart may include some of the following:

	Factory	Leaf
needs	electricity or gas	water carbon dioxide sunshine
wastes	smoke	oxygen
produces	something to sell	sugar
parts	machines	air and light

Hang the chart on the wall for future reference.

To observe how leaves vary, students will gather different types of real leaves. They will have a choice of doing leaf rubbings, drawing different types of leaves, or dry pressing them and gluing them to paper in an artistic fashion. Put these in a folder to begin making a book about plants.

Students will write in their learning logs what they found meaningful about plants.

2. Concept: Plants have different parts and functions. Flowers differ in size, shape, and

color, but most flowers have the same parts and make seeds.

Into: Show a scientific drawing of a flower labeled with pistil, stamens, ovary, and petals. Read to the class the information from page 49 of McCrackens' Spring theme book about flowers. A sample drawing is on the page as well. Make a large poster drawing of it or make a transparency for use on an overhead projector.

Through: Read to the class, The Reason for a Flower. Discuss the picture sequence of the flower becoming a plum with students. Read to the students "The Seed Makers" in Plants do Amazing Things. Also read pages 38-41 of Childcraft (Vol. 6).

Beyond: Give groups of five or six students several different flowers and have them find and name the different parts of the flowers. Watch the film Learning about Flowers and Their Seeds.

Children will have a choice of:

* working in groups of five or six to paint a flower mural, mixing white and primary colors to create pastels,

* making up a song about flowers and teaching it to the class,
* creating a flower collage from seed catalogues,
* making a "TV" illustration sequencing how a flower becomes a seed with a cardboard box "television."

Ask students to bring seeds they find for the next lesson.

Students will write in their learning logs.

3. Concept: **Plants have various parts and functions. Seeds grow into new plants.**

Into: Bring some birdseed to class. The students will work in groups of three or four, using magnifying glasses to observe and sort the seeds with a pencil or fine object.

Ask students to bring seeds of different shapes, sizes, and colors. Place these in various places around the room. Label what kind of seed each is, if known. Students will take a piece of paper to the different places in the room, drawing and labeling at least five different kinds of seeds.

Gather all the seeds together and give groups of five or six children a handful of seeds and have them sort them in as many ways as they can think of with a name for each category. Make it a game, giving points to groups for each way they sort seeds.

Through: Listen to the tape and read along in individual copies of the book, What is a Seed? Read to the students A Seed is a Promise.

Beyond: Each student will plant a lima bean seed in a clear plastic cup. Tell them to put the seed on the side of the cup and add a damp paper towel to hold it in place. Moist cotton in the center of the cup will help hold in water.

Each student will estimate the number of days until their seed begins to grow. When it does begin to grow, they will compare the actual number with their estimate, then measure the growth daily with a ruler and keep a record of its growth. Students may make a class graph after a several days, comparing the heights of the plants.

Students may place their seeds in different environments such as: light and moist, light and dry, dark and dry, and dark and moist. After several days they can observe, compare, and discuss growth of the seeds and young plants in each environment.

Students will read What is a Seed? booklets and A Seed is a Promise again to find ways that seeds travel. List these on the chalkboard. In small groups, students will choose one way seeds travel and pantomime it. The class will try to guess which way the group is demonstrating.

Give each child four papers that each have printed on them, "Some seeds travel by_____." Students will finish each sentence and illustrate it. This could be done for homework with students collecting real seeds and gluing them to the paper as part of the picture. Add these to the books about plants.

Read these stories, articles, and poems to the class: Plants that Never, Ever Bloom; "Caraway Seeds"; Childcraft (Vol. 6) pages

22-25, "What's in a seed?" and "Do all Plants Come from Seeds?"; and "Baby Seeds" and "Little Cradles" from Spring. Students may have a choice of:

* memorizing one of the poems from Spring or another poem about seeds to say for the class,
* illustrating one of the poems,
* finding some plants that do not grow from seeds and telling the class about them,
* opening some seeds and describing to the class or drawing a picture of what is inside.

For math, do this activity with peas. Give each child a pea pod. Have them estimate the number of peas (seeds) inside. Have them open the pod, count, and compare the number found with their estimate. Make a graph showing how many pods were found with the same number of peas.

Some peas will fall on each side of the pod when it is opened. Each child will state an addition sentence about the peas according to how many are on each side of the pod. Then

have children estimate how many total peas the class has. Have them put the peas in groups of ten and count them, mentioning tens and ones for place value.

Students will write in their learning logs.

4. Concept: **Plant parts have different functions. The roots absorb water for the plant and anchor it in the soil.**

Into: Have several plants with roots visible available for observation, such as carrots, radishes, onions, potatoes, grass, weeds, and any garden flower. Give students opportunities to handle the plants and observe the roots with a magnifying glass, looking for root hairs.

Through: Read to the class "What Roots Do," pages 32-33 of Childcraft (Vol. 6). Have students read on their own Holt Science, grade two, pages 188-191. Students may choose to read either Growing Vegetable Soup or Stone Soup in small groups using multiple copies of the books so each child has one. Have each group list all vegetables mentioned in their book.

Beyond: Students will bring the vegetables mentioned in the books read, think of ways to sort them, and make vegetable soup.

Review the pictures of roots in A Reason for a Flower. Cut a carrot just below the stem and cut the stem short. Put the carrot in water and students can predict what will happen and watch for stem growth.

Put a potato in water that has been colored with red food coloring. After a few days observe its color. Cut it to observe the center.

Students will draw various kinds of roots and explain orally why root hairs help the plant absorb water. Students will label these drawings.

Students will write in their learning logs.

5. Concept: Plants have different parts and functions. Stems hold up the plant. Water and minerals pass through it.

Into: Bring several plants with different types of stems--ferns, vines, cactus, grass, and small

pine trees. Students will observe the different types of stems.

Through: Read to the class, Childcraft (Vol. 6) pages 104, 105, and 34-37. Students will read Holt Science, grade two, pages 193-196, with a partner.

Beyond: Have groups of five or six students put red food coloring in a glass of water. Add a piece of leafy celery and have students predict what will happen. Students will observe the celery and will draw a picture of how water and minerals move up a stem. Add these to the books about plants. In small groups, have students create a modeling clay sculpture showing different types of stems and share their sculpture with the rest of the class.

Students will write in their learning logs.

6. Concept: Plants have a cycle of growth and are affected by seasonal changes.

Into: Have students name the four seasons. Read Spring: Discovering the Seasons to the class. Read the story Little Pussycat and have students identify each season in the story as

the seasons change. Review the pages in What is a Seed? and The Reason for a Flower about how seeds travel.

Introduce the book, The Tiny Seed. Talk about the author, Eric Carle, and other books we have read by him. Have students guess how the artwork was done.

Through: Read to the Class The Tiny Seed. Students will choose to read one of these stories or poems to present to the class: "Maytime Magic," "I Dig, Dig, Dig," "Dig a Little Hole," "Growth," "Victor Helps Out," "Growing Things," and Pumpkin Pumpkin. Students will form small groups based on their choice of reading selection, with students reading the same selection working together.

Beyond: Students will draw a large circle on a piece of paper and divide it into quarters. In each section they will draw what happened in the story, The Tiny Seed, during each season and label fall, winter, spring, and summer. Put these into their plant books.

Working in groups chosen earlier, students will present the story or poem they chose to the class in one of these ways:

* memorize it and develop accompanying choreography,
* make a poster illustrating it,
* make a "TV show" illustrating it,
* dramatize it,
* dance it,
* present it in any other way the group wishes to share the information.

Students will write in their learning logs.

7. Concept: Plants change and are affected by the seasons.

Into: Allow students to share their drawings of the seasons depicted in The Tiny Seed. Put these in their books about plants. Teach all students the words and motions of "A Growing Tree."

Explain that trees are plants that are affected by the seasons differently than the flower in A Tiny Seed. Explain the word annual means it lasts one year and perennial means it lasts longer. Trees and some plants are

perennial because they live year after year. Also explain that deciduous trees loose their leaves when they change color but evergreen trees do not shed their leaves.

Through: Have students listen to the tape and read along in individual booklets, Trees.

Beyond: Read to students "Why Leaves Change Color" and "Evergreens" in Childcraft (Vol. 6). Take a walk and look at growth on real trees. Students will draw a picture and write a sentence about what the trees will look like in a few months. Students will draw another circle, divide it into quarters and label them with the four seasons. They will draw a deciduous tree in each section. Add these to their plant books.

Read the poem "Trees" to the class.

Students will write in their learning logs.

8. Concept: Plants vary according to their environment.

Into: Show pictures of deserts, swamps, forests, and plains from Holt Science, grade one,

pages 29-36. Have students brainstorm what they know about each place. Explain that plants need water and sunlight. Some plants need more of these than others, so different kinds of plants live in different places. Plants live together in communities with similar kinds of plants, as people often live in communities with other people with similar tastes and needs.

Through: Reread pages in A Reason for a Flower about plants that like wet and dry places. Read to the class chapter three in Childcraft (Vol. 6), "Nature's Neighbors." This covers woodland, grassland, underwater, forest, desert, and far northern plants.

Beyond: Have students work in partners to examine a cactus. Aloe vera works well because it is not very thorny. Have students cut a section of a leaf and examine the thick hide and water inside. Ask a student to explain to the class how this helps the cactus survive in the desert.

If possible, also have them examine the stem of a lily pad. It is hollow inside to allow the plant to float on the water.

Students will copy these sentences on separate pages, complete the sentence with the name of one plant, illustrate the sentence with a painting or colored drawing, and add them to their books.

_____grows in the woodland.
_____grows in the grassland.
_____grows in the rain forest.
_____grows in the ocean.
_____grows in the pond.
_____grows in the ocean.
_____grows in the desert.
_____grows in the frozen north.

Students will write in their learning logs.

9. Concept: Plants have many uses, including food, and are necessary for life.

Into: Read a page or two of each of these books: A Garden for Miss Mouse, The Giving Tree, The Popcorn Book, The Reason for a Flower, Please Pass the Grass, Blueberries for Sal, "Trees and Paper" in Together We Go, and "Medicine from Plants" in Childcraft, (Vol. 6). Students will choose a book and form groups based on their

book choice, with students choosing the same book in the same group.

Through: Students will read their books in groups. One person may read to the group, they may pass the book around, taking turns, or read chorally. Groups may choose which way to read as long as everyone receives the information.

Beyond: The students will work together to present to the class the way their book explained that plants are used. They may make posters, perform drama, bring actual items to show and share, or any other medium they choose. They will report orally to the class.

Read to the students the last paragraph on page 17 of Plants do Amazing Things. It ends with this question, "What would you do without plants?" Ask the question of the students. Through a class discussion, help them conclude that people would have no food without plants and would eventually die. They could not eat meat, because meat comes from animals who eat plants or other plant-eating animals.

Students will write about why plants are necessary. They should include a title and at

least two uses of plants. Some students should include more, depending on their capabilities. Most students will be able to revise and edit as well. A parent volunteer or the teacher, or in some cases, the student, can type the final draft and put it into the plant book. Students will write in their learning logs.

10. Concept: **The way food is brought to consumers has changed over time.**

Into: Students will draw a picture of what they think the world was like 200 years ago. Ask them to include a picture of a farm, a store, how people traveled, and people working.

To prepare students for reading, explain that maple syrup is made from maple trees by taking the sap from the tree and boiling it. Remind them that wool comes from sheep and is woven into yarn or cloth.

Through: Students will choose either The Ox-cart Man or Food from Farm to Family to read with a partner.

Beyond: Have students form groups of four, including two who read The Ox-cart Man and two who read Food from Farm to Family. They will make a

chart comparing how getting food from plants is different in the two books, given the following questions:

* Who produced the food?
* How much food was produced?
* How was it carried?
* How was it packaged?
* How many kinds of things did a group make?
* How many people were involved in a product before completion?

Explain they do not need to tell exactly how many, just whether there were many or few. A finished chart might look like this:

The Ox-Cart Man	From Farm to Family
produced by a family	produced by a team of workers
small quantities	large amounts
carried in wagons	carried in trucks or trains
packaged in barrels or bags	packaged in cans and boxes
family made a variety of things	factory deals with one kind of material
family worked with food from planting to sale	different people grow, pack and sell food

The students will work in their groups to create two shoe box and paper dioramas showing how one type of food used to be produced long ago and how it is produced now. They may use materials they bring from home as well. The students and the teacher may need to research for more information depending on the kind of food chosen. Each group will write a paragraph describing their work. Xerox it for each child in the group. Add these to the plant books.

Students will write in their learning logs.

11. Concept: People need to take care of plants making sure they do not destroy plants they may need.

Into: Review with the students what the world would be like without plants. Read to them "Saving the Plants" in Childcraft (Vol. 6).

Through: Students will read The Lorax. Discuss with the students the attitudes of the characters in the book and the effects of environmental abuse, and the glimmer of hope at the end of the book.

Beyond: For homework students will ask their parents to help them find articles in newspapers and magazines about deforestation and may bring these to class to share. Post them on the bulletin board. Students will write letters to their congressmen asking them to help stop deforestation.

Students will write in their learning logs.

12. Concept: **There are many careers involving plant care and production.**

Into: Take a field trip to a farm, to a factory that produces food, to a nursery, and have a pharmacist visit the class to explain how some medicines come from plants.

Through: Read to the students Careers in Agriculture. Review various uses of plants and have students brainstorm other careers involving plants.

Beyond: Students will have a choice of:

* returning to or phoning one of the places visited for homework, interviewing a worker and reporting to the class,

* making a diorama of one of the places visited,
* dressing up as one of the workers, including props, and telling what that worker does as if he were that worker.

Culminating Activity: Students will create a title for their plant books and put it together by tying ribbon through punched holes. They will take their books, and, if they wish, their learning logs, to another classroom and sit down one-to-one with those students and share their books.

Curriculum Map

Art.

Make a poster identifying some plants and their uses

Draw seeds, leaves, flowers, and roots

Create pictures with seeds

Paint a flower mural

Make dioramas about food production now and long ago

Make leaf rubbings in different colors or a dry leaf collage

Copy scientific drawings of flowers

Draw or paint plants in the four seasons

Make a flower collage from seed catalogues

With a cardboard box with a window and paper on a rod, make a "TV" show illustrating the life of a plant

Illustrate sentences about how seeds travel

Illustrate a poem about seeds

Drama.

Act out the poem, "A Growing Tree"

Pantomime ways seeds travel

Show the events of a story through drama or dance

Dress up as someone who works with plants and tell about their job

Social Studies.

Learn about careers involving plants

Explain how processing food has changed since 200 years ago

Find information about deforestation

Work in cooperative groups

Visit businesses involving plant use and care

Music.

Make up songs about seeds and plants

Health.

Read about medicinal plants

Science.

Create a chart comparing leaves to factories

Predict, observe, and record data

Oral Language.

Explain how the seasons affect some plants

Report on uses of plants

Use oral language to state knowledge about plants

Name categories when sorting

Memorize a poem to say for the class

Interview someone who works with plants

Math.

Estimate and measure growth of a plant over time

Participate in a math activity using peas--addition,

subtraction, estimating, graphing, and counting with place value

Measure in cooking activity--making vegetable soup

Sort and classify seeds

Graph plant growth

Writing.

Draft, revise, and edit a piece of writing, "Why Plants are Important"

Complete sentences about leaves and habitats of plants

Write a letter to a congressman about stopping deforestation

Make a book about plants

Label parts of a drawing

Keep a daily learning log

References

Abruscato, J., Fossaceca, J. W., Jassard, J., & Peck, D. (1986). Holt science: Grade 1. New York: Holt, Rinehart, and Winston.

Abruscato, J., Fossaceca, J. W., Jassard, J., & Peck D., (1986). Holt science: Grade 2. New York: Holt, Rinehart, and Winston.

Adelson, L. (1960). Please pass the grass. New York: David McKay Co.

Anonymous. (1987). Baby seeds. In R. McCracken & M. McCracken (Eds.), Spring (p. 44). Winnepeg: Hignell Printing Limited.

Anonymous. (1987). Dig a little hole. In R. McCracken & M. McCracken (Eds.), Spring (p. 44). Winnepeg: Hignell Printing Limited.

Anonymous. (1987). Growth. In R. McCracken & M. McCracken (Eds.), Spring (p. 44). Winnepeg: Hignell Printing Limited.

Anonymous. (1987). I dig, dig dig. In R. McCracken & M. McCracken (Eds.), Spring (p. 45). Winnepeg: Hignell Printing Limited.

Anonymous. (1987). Little cradles. In R. McCracken & M. McCracken (Eds.), Spring (p. 45). Winnepeg: Hignell Printing Limited.

Ayer, J. (1962). The paper flower tree. New York: Harcourt, Brace & World.

Behn, H. (1987). Trees. In R. McCracken & M. McCracken (Eds.), Spring (p. 45). Winnepeg: Hignell Printing Limited.

Benson, C. (1974). Careers in agriculture. Minneapolis, MN: Lerner Publications Co.

Brown, M. W. (1951). Little pussycat. New York: Western Publishing Co.

Carle, E. (1987). The tiny seed. New York: Scholastic.

Cooper, E. (1979). Trees and paper. In M. Early (Ed.), Together we go (pp. 70-74). New York: Harcourt Brace Jovanovich.

Cooper, E. (1979). Victor helps out. In M. Early (Ed.), Sun and shadow (pp. 130-136). New York: Harcourt Brace Jovanovich.

de Paola, T. (1978). The popcorn book. New York: Scholastic.

Ehlert, L. (1987). Growing vegetable soup. New York: Harcourt Brace Jovanovich.

Encyclopedia Britannica. (1983). Learning about flowers and their seeds [videotape]. Chicago: Encyclopedia Britannica.

Gleiter, J., & Thompson, K. (1985). Johnny Appleseed. Nashville: Ideals Publishing Corp.

Hall, D. (1979). The ox-cart man. New York: Scholastic.

Heller, R. (1983). The reason for a flower. New York: Scholastic.

Heller, R. (1984). Plants that never ever bloom. New York: Scholastic.

Lashley, C. (1989, May). A growing tree. Highlights, p. 43.

McClosky, R. (1976). Blueberries for sal. New York: Scholastic.

McCracken, M. & McCracken, R. (1987). Spring. Winnipeg: Hignell Printing Limited.

McGovern, A. (1968). Stone soup. New York: Scholastic.

Merrill, C. (1973). A seed is a promise. New York: Scholastic.

Muntean, M. (1982). A garden for Miss Mouse. New York: Parents Magazine Press.

National Geographic Society. (1983). Wonders of learning kit: Trees [booklets & cassette recording]. Washington, DC: Author.

National Geographic Society. (1983). Wonders of learning kit: What is a seed? [booklets and cassette recording]. Washington, DC: Author.

Nussbaum, H. (1977). Plants do amazing things. New York: Random House.

Potter, B. (1970). The tale of Peter Rabbit. New York: Golden Press.

Pursel, M., & Radlauer, R. S. (1967). Food from farm to family. Pasadena, CA: Franklin Publications.

Santry, L, (1983). Spring: Discovering the seasons. Mahway, NJ: Troll.

Silverstein, S. (1964). The giving tree. New York: Harper & Row.

Stevens, C. (1976). The magic carrot seeds. New York: Scholastic.

Suess, Dr. (1971). The lorax. New York: Random House.

Titherington, J. (1986). Pumpkin, pumpkin. New York: Scholastic.

Watts, M. (1979). Maytime magic. In Sun and shadow (p. 142). New York: Harcourt Brace Jovanovich.

Wilber, F. (1987). Caraway seeds. In R. McCracken & M. McCracken (Eds.), Spring (pp. 52-55). Winnipeg: Hignell Printing Limited.

World Book, Inc. (1989). Childcraft: The green kingdom (Vol. 6). Chicago: Author.

Yashima, T. (1953). The village tree. New York: Viking Press.

Teeth

Rationale

Losing teeth is a significant part of a young child's life. Children need to learn to care for their teeth so their teeth will last throughout their lives. Children need to become aware of various careers available, including those involving care of teeth. Studying teeth provides scientific insights into animals, past and present, and provides opportunities for imaginative thinking, reading, and writing.

Concepts

1. Baby teeth come out and permanent teeth come in.
2. Some people like to "give their tooth to the tooth fairy."
3. Teeth can get painful cavities.
4. To care for teeth, brush, floss, and visit the dentist.
5. Eating healthful foods helps teeth.
6. Many careers exist in the dental field.
7. Teeth have different shapes and sizes for different uses.
8. Animals' teeth help them in various ways; scientists can tell what animals eat/ate by their teeth.
9. In literature teeth are often used to characterize scary or unpleasant creatures.

Throughout the Unit

* Students will maintain author's folders, putting all writing in them.
* Read to the students a little each day from the book, The Dinosaur Tooth.
* Books used in the unit will be available to all children for daily sustained silent reading.
* Children will daily write in individual learning logs.
* Keep an ongoing graph throughout the school year of how many children lost teeth each month.
* The books listed in the unit will be available for silent reading as well as The Mango Tooth, You Can't Put Braces on Spaces and Crocus.

Lessons

Introduction to Unit: Show the film Teeth are for Chewing.

1. Concept: Baby teeth come out and permanent teeth come in.

Into: Read to the class One Morning in Maine. Allow children to tell stories about when they lost a tooth. Discuss whether or not there was blood, how they felt, conditions surrounding

the loss of a tooth, and feelings they had while the tooth was loose.

Through: Show the students the books The Wobbly Tooth, Arthur's Loose Tooth, and The Prince's Tooth is Loose. Ask them what they think the stories might be about. On the chalkboard, write several students' predictions about what will happen in each story. Each student will choose one story to read silently. Then students will pair with another student who read a book they did not read. Students may tell the stories to each other. Discuss and verify the predictions with the whole class.

Beyond: Tell the class that baby teeth are called primary teeth. These teeth are replaced by permanent teeth. Tell the children that deciduous teeth are primary teeth. Deciduous trees are trees that lose their leaves. Ask, "How are primary teeth and leaves the same?" "How are they different?"

Ask, "Are babies born with teeth?" and "Why do you think newborn babies do not need teeth?"

Have students write a story about a time they lost a tooth or, if they never have, what

they think it would be like to lose a tooth. Prepare author's folders for each child and put the stories in them.

In groups of five or six, have children make a graph comparing how many teeth they have lost. Ask, "Who lost the most?," "Who lost the least," and "Did anyone lose the same amount as someone else?" Hang all graphs on a bulletin board. Compare them. Discuss why they are different.

2. Concept: When children lose a tooth they sometimes give it to the tooth fairy.

Into: Review the concept that primary teeth fall out naturally. Read to the class Little Rabbit's Loose Tooth. Discuss the meaning of the term "a window in her mouth" and Little Rabbit's dilemma over whether to give her tooth to the tooth fairy.

Read to the class The Good-Day Bunnies Tooth Day. Allow students to relate experiences of getting money from the tooth fairy and beliefs about the tooth fairy.

Through: Students will read in small groups A Tooth for the Tooth Fairy and The Tooth

Fairy. With each group, make a comparison chart of how the books are the same or different.

Students will do reader's theatre with Little Rabbit's Loose Tooth, changing the story to read like a play with narrators and characters.

Beyond: Students will write a persuasive piece about whether or not one should give his or her tooth to the tooth fairy. Put this in their author's folders.

Little Rabbit got a dime for her loose tooth. Ask the children, "If you got a dime for each loose tooth how much money would you get for two loose teeth?, for three loose teeth?" Teach students the cent value of dimes, review counting by tens, and have them do a worksheet about teeth for the tooth fairy (Milliken Math Activities, p. 17).

3. Concept: Teeth can get painful cavities.

Into: Ask children what they know about cavities and fillings. Let children share their experiences and knowledge. Read to the class the book

Teeth, pages 8-12, describing parts of a tooth and what happens when there is a cavity. Show the children the books listed below and have them tell about the pictures and make predictions. Read the first page or two of each book.

Through: Students will choose one of the following books or poems to read in a small group of five or six students, first silently, then orally. There should be multiple copies of each book or poem: Alligator's Toothache, Albert's Toothache, Dr. De Soto, The Bear's Toothache, "The Crocodile's Toothache", and Michael and the Dentist. Each group will meet with the teacher to prepare a list of ways the main character dealt with a toothache.

Beyond: Share the lists with the class. Read to them "The Crocodile's Toothache" and watch the film Dr. De Soto. Compare the attitude of the two dentists in the two pieces.

Brainstorm words involving a toothache--how it feels, what one does, medicine, and so on. Write a haiku poem about a toothache.

4. Concept: Eating healthful foods helps teeth.

Into: Reread Teeth, pages 4-7, about food's effect on teeth. Do this experiment from Scholastic News Pilot, (1990).

Explain that plaque is a sticky layer that forms on teeth. Plaque grows by eating up bits of food, especially sugar and starchy ones. As the plaque eats up the sugars, acid is left over. Acid is not good for teeth. To show how this happens set up this experiment for the class to observe. First, explain that a tooth's hard covering and an eggshell are made of the same material--calcium.

*Put pieces of an eggshell in two clear glasses.

*Cover the eggshell in one glass with vinegar (an acid). Cover the other eggshell with plain water.

*Check the eggshells each day. Observe changes.

*When all the vinegar and water has evaporated, check the bottom of each cup. What do you see?

Students should observe white powder in the cup with vinegar--it is calcium from the eggshell, dissolved by vinegar. Talk about how kids can prevent plaque from forming by brushing, flossing, and cutting down on sugar foods (p. 4).

Have children brainstorm a list of good and bad foods for teeth. Discuss with children what the term "sweet tooth" means.

Through: Print the poem "The Sweet Tooth" on a large chart. Read it to the class and have children read it chorally. Read to the class Nutrition.

Beyond: Discuss the poster, Good Foods to Eat. Students will draw and label pictures of foods that are good for teeth and bad for teeth, making two sets of pictures.

5. Concept: Teeth need care--brushing, flossing and dental checkups.

Into: Have students brainstorm things they need to care for their teeth. Let students relate stories of visits to the dentist and feelings about dentists. Show the children a cast of teeth and talk about what gums are and why they need to be strong.

Through: Students will choose one of these books and read it with a small group, first silently, then taking turns reading pages: The Berenstain Bears Visit the Dentist, I Know a Dentist, My Dentist, Young Scientist and the Dentist, When I See My Dentist, Michael and the Dentist, At the Dentist: What did Christopher See?, My First Dentist Visit, and "The Tooth" in George & Martha.

Beyond: Students will prepare a way to relate their story to the class. They may tell the story, act it out, make posters of the main ideas, make puppets of a tooth and relate the story from a tooth's point of view, or whatever way they wish to create.

Invite a dental hygienist or dentist to come to class, show dental tools, and explain dental care.

Teach the song, "Brush Your Teeth." Let students pretend to brush their teeth while singing.

Students will pantomime someone brushing and flossing their teeth.

For homework students will keep a daily chart recording whether they brushed and flossed their teeth.

6. Concept: **Many careers exist in the dental field.**

Into: Students will brainstorm, based on their experience and on the books they have read, all the people they can think of who work in or are associated with a dentist's office. Record this list on the chalkboard.

Through: Read to the class Careers in Dental Care.

Beyond: Visit a dentist's office and, if possible, an orthodontist's office. Students will write a letter to the office people thanking them for the visit and naming something they learned. They will address and stamp the envelope.

7. Concept: **Teeth have different shapes for different uses.**

Into: Show the class the poster, All About Teeth. Read the small print and discuss the different parts and shapes of teeth and how each tooth works. Give each student a piece of meat on a bone and a piece of a carrot. While they eat, ask them to pay close attention to which teeth

they use to tear the meat off the bone, to bite the carrot, and to grind their food.

Through: Students will read the booklet and listen to the tape, Wonders of Learning Kit: Teeth. Students will read the story My Teeth Bite.

Beyond: Students will look through magazines for pictures of tools that are used like teeth, such as scissors, axes, or lawn mowers. Students will cut out the pictures and hang them on the bulletin board.

Have students slowly say each letter of the alphabet, noting which sounds they make with the help of their teeth and which teeth are used most.

8. Concepts: **Animals' teeth help them in various ways. Scientists can tell what type of food animals eat/ate by their teeth.**

Into: Draw or xerox a simple encyclopedia drawing of the mouth, teeth, tongue, and nerves. Make an overhead transparency and put it on the overhead projector. Have students copy it and label parts.

Bring several skulls of various animals. Discuss the shape of the teeth and what the

animal ate. Show the students the poster Animal Teeth: Scissors, Shovels and Saws. Discuss the shapes of the teeth and how they are used.

Through: Students will choose from these books: Snake, Great Dinosaurs, Tyrannosaurus was a Beast, Whales, Animals Do the Strangest Things, Dolphins, The Day of the Dinosaur, Teeth, pages 14-22, How Kittens Grow, and Wild Animals and Their Babies. Students will form reading groups based on their choice of book with students reading the same book in the same group.

Beyond: Each group will briefly report to the class on the animal's teeth in their book.

Students will look through nature magazines and cut out pictures that show animals' teeth, making a class collage of animal teeth.

Arrange for a veterinarian to visit class to talk about animal teeth.

Ask students to imagine that they had the teeth of some animal. Students will write a story about what it would be like to have those

teeth. Put the stories in their author's folders.

9. Concept: In literature teeth are often used to characterize scary or unpleasant creatures.

Into: Draw two large faces on the chalkboard. Make one with large, sharp, teeth and one with a closed mouth. Discuss with students which looks more frightening.

Through: Read to the students some of these stories: Molly's Monsters, Abiyoyo, Harry and the Terrible Whatzit, Liza Lou and the Yeller Belly Swamp, There's Something in My Attic, There's an Alligator Under My Bed, Three Billy Goats Gruff, and Little Red Riding Hood. Tell them to notice any mention of teeth and look for teeth in the pictures. Read chorally in small groups and in partners Where the Wild Things Are.

Beyond: Discuss why creatures with big, sharp, or many teeth seem more frightening.

Students will create a picture of a scary face, using teeth to make it look ferocious.

Students will write a story describing their creature. Put the stories in their author's folders.

Unit Conclusion

Have students pick one story from their author's folder. They will read it to a group of peers. Other students will tell what they like and what might make it better. Students may revise and will edit their story. A parent volunteer may type it and students will illustrate it in some way.

Curriculum Map

Science.

Observe acid's effect on calcium

Draw parts of teeth

Sort healthful and unhealthful foods

Listen to a dentist or hygienist explain care of teeth

Eat meat and carrots and observe which teeth are used

Observe teeth in animal skulls

Writing.

Keep a daily learning log

Write a story about a time a tooth came out

Write about whether one should give their tooth to the tooth fairy

List ways to deal with toothaches

Write a haiku about toothaches

Write a letter to a dentist

Write an imaginative story about having animal teeth

Revise, edit, make a final copy, and illustrate one piece of writing

Oral Language.

Share information from books with the class

Share personal experiences with the class

Using a tooth puppet, explain what it is like to be a tooth

Drama.

Act out a story

Pantomime brushing teeth

Perform reader's theatre

Music.

Sing "Brush Your Teeth"

Social Studies.

Identify careers in health care

Visit a dental office

Listen to a veterinarian talk about animal teeth

Stamp and address an envelope and mail a letter

Math.

Keep an ongoing lost-tooth graph

Chart days teeth were brushed and flossed

Count by tens

Learn value of dimes

Graph how many teeth children have lost

Art.

Make a tooth puppet

Make a collage of animal teeth

Cut out and arrange magazine pictures showing ways tools are used like teeth

Draw a scientific drawing of the mouth, tooth, gums, and nerves

Draw good and bad foods for teeth

Make a poster illustrating the main ideas of a story

Create a picture of a creature showing its teeth

References

Allen, J. (1987). My first dentist visit. Provo, UT: Aro Publishing.

Barnett, N. (1977). I know a dentist. New York: G. P. Putnam's Sons.

Barr, G. (1970). Young scientist and the dentist. New York: McGraw-Hill.

Bate, L. (1975). Little rabbit's loose tooth. New York: Scholastic Book Services.

Berenstain, S., & Berenstain, J. (1981). The Berenstain bears go to the dentist. New York: Random House.

Berenstain, S., & Berenstain, J. (1987). The day of the dinosaur. New York: Random House.

Booth, D. (1984). My teeth bite. In S. Meland, W. Cochran, & J. Van Huyse (Eds.), Catch a rainbow (pp. 60-63). Canada: Holt, Rinehart & Winston of Canada, Limited.

Brush your teeth [song] (1990). In M. Palmer, M. L. Reilly, & C. R. Scott (Eds.), World of Music (p. 128). Morristown, NJ: Silver Burdett & Ginn.

Cooney, N. E. (1978). The wobbly tooth. New York: G. P. Putnams' Sons.

DeGroat, D. (1977). Alligator's Toothache. New York: Crown Publishers Inc.

Dental Health Month. (1990, February). Scholastic News Pilot, p. 4.

Dinolfo, J., & Hanks, R. (1982). A Weekly Reader teaching poster: All about teeth [poster]. Columbus, OH: Field Publications.

Duvoisin, R. A. (1977). Crocus. New York: Knopf.

Gackenbach, D. (1977). Harry and the terrible whatzit. New York: Scholastic.

Gunther, L. (1978). A tooth for the tooth fairy. Champaign, IL: Garrard Publishing Co.

Hoban, L. (1985). Arthur's loose tooth. Middletown, CT: Weekly Reader Books.

Hoffman, M. (1986). Snake. New York: Scholastic.

Hornblow, L., & Hornblow, A. (1964). Animals do the strangest things. New York: Random House.

Kessell, J. K. (1984). Careers in dental care. Minneapolis, MN: Lerner Publications.

Kuklin, S. (1988). When I see my dentist. New York: Bradbury Press.

LeMaster, L. J. (1985). Nutrition. Chicago: Childrens Press.

Margolin, H., & Nicklaus, C. (1987). The good day bunnies tooth day. Racine, WI: Western Publishing Co.

Marshall, J. (1972). The Tooth. In George and Martha. New York: Scholastic.

Milliken Publishing Co. (1976). Math activities: Grades one and two. Saint Louis, MO: Author.

Mayer, M. (1976). Liza Lou and the yeller belly swamp. New York: Four Winds Press.

Mayer, M. (1987). There's an alligator under my bed. New York: Dial Books for Young Readers.

Mayer, M. (1988). There's something in my attic. New York: Dial Books for Young Readers.

McClosky, R. (1952). One morning in Maine. New York: The Viking Press.

McPhail, D. (1972). The bears toothache. Boston: Little, Brown & Co.

Moris, R. A. (1975). Dolphins. New York: Harper & Row.

National Geographic Society. (1983). Wonders of learning kit: Teeth [booklets and cassette recording]. Washington, DC: Author.

Ohanesian, D., & Hanks, R. (1982). A Weekly Reader teaching poster: Good foods to eat [poster]. Columbus, OH: Field Publications.

Peters, S. (1981). The tooth fairy. Mahwah, NJ: Troll.

Pfloog, J. (1971). Wild animals and their babies. New York: Merrigold Press.

Pomerantz, C. (1977). The mango tooth. New York: Greenwillow.

Prelutsky, J. (1988). Tyrannosaurus was a beast. New York: Scholastic.

Pyle, K. (1964). The sweet tooth. In W. Cole (Ed.), Beastly boys and ghastly girls (p. 57). Cleveland: The World Publishing Co.

Richter, A., & Numeroff, L. J. (1979). You can't put braces on spaces. New York: Greenwillow.

Rockwell, H. (1975). My dentist. New York: Greenwillow Books.

Rudin, E. (1982). The three billy goats gruff. Racine, WI: Western Publishing Co.

Silverstein, S. (1974). The crocodile's toothache. In Where the sidewalk ends (p. 66). New York: Harper & Row.

Scholastic News. (1990, February). Animal teeth: Scissors, shovels and saws. [Poster]. Jefferson City, MO: author.

Seeger, P. (1963). Abiyoyo. New York: Scholastic.

Selsam, M. E. (1973). How kittens grow. New York: Scholastic.

Sendak, M. (1963). Where the wild things are. New York: Harper & Row.

Slater, T. (1988). Molly's monsters. New York: Platt & Munk.

Steig, W. (1982). Dr. De Soto. New York: Scholastic.

Walt Disney. (1971). Teeth are for chewing [videotape]. Burbank, CA: Coronet MPI.

Watson, J. W. (1975). Whales. New York: Golden Press.

Western Publishing Co. (1964). Little red riding hood. Racine, WI: Author.

Weston Woods (1984). Dr. De Soto [videotape]. Weston Woods, CT: Weston Woods Films.

William, B. (1974). Albert's toothache. New York: Dutton.

Wolff, B. (1980). Michael and the dentist. New York: Four Winds Press.

Wonder Books. (1971). Teeth. New York: Author.

Wyeth, S. D. (1990). The dinosaur tooth. New York: Bantam Books.

Ziegler, S. (1930). At the dentist: What did Christopher see?. Chicago: Children's Press.

Ziefert, H. (1990). The prince's tooth is loose. New York: Random House.

Zobelein, J. (1974). Great Dinosaurs. Kansas City, MO: Hallmark Cards, Inc.

Weather

Rationale

Children's primary contact with nature is the weather. Weather affects the daily life of all people. Children need to know what causes the weather and its effect on them. Weather provides a meaningful medium for thought and language and is frequently mentioned in literature. Human activities may affect the weather. People need to use resources wisely so as not to change weather patterns detrimentally.

Concepts

1. Water exists in one of three forms, solid, liquid, or gas, depending on its temperature.
2. Water, air, and sun cause weather.
3. Clouds are evaporated water.
4. Fog is low clouds.
5. The water cycle is part of weather.
6. People need water and use it for leisure.
7. Weather affects people, including their clothing, activities, feelings, and sometimes their work.
8. Air is everywhere.
9. Wind is moving air.
10. Lightning and thunder are caused by electricity.
11. Weather can be predicted and measured.
12. Weather is fun to think and write about.
13. Weather changes through the seasons.
14. Pollution may be causing the earth to warm, threatening life as people now know it.

Throughout the unit

* Students will daily record learning in a learning log.
* The teacher will read to the class Mary Poppins, noting changes in the weather as changes in the story events occur.
* The class will keep a graph of the daily weather.
* The class will keep a daily graph of each day's high and low temperature.
* Students will read or listen to someone read the newspaper weather forecast daily.
* The books in the unit will be available for daily sustained silent reading as well as these books about weather: Amos and Boris, Thunder Cake, Animals in Winter, Blueberries for Sal, Bear Weather, The Wreck of the Zephyr, Exploring the Weather, A Day in the Life of a Meteorologist, Lindbergh, the Lone Flier, One Bright Monday Morning, Umbrella, Benji and the Tornado, and It's Raining Cats and Dogs.
* Students will maintain author's folders, putting all writing in them.

Lessons

1. Concepts: Water exists in any one of three forms, solid, liquid, or gas, depending on its temperature. Weather can be measured.

Into: Show water in ice form, then put it in sunshine for a while. Ask "What happens?; Why?" Put the water in a pan and boil it on a hot plate. Children will observe steam. Discuss liquid, solid, and gas and the effect of temperature on water.

With small groups of children fill three glasses, one with ice water, one with tap water, and the other with very hot water. Children will watch what happens to the mercury in a thermometer as it is moved from glass to glass. Remind them that a thermometer measures temperature. Have children predict what the thermometer would do in the hot sun, in cold weather, and so on.

Through: Children will silently read Holt Science, grade two, pages 61-63. Discuss what water vapor is.

Beyond: Students will write in their learning logs.

2. Concept: Clouds are evaporated water.

Into: Put water in two shallow pans. Place one in the sun and one in the shade. Observe them over several days (Webster, 1982, p. 23). Discuss what happens and why. Discuss evaporation and the effect of heat on evaporation. Ask, "Where does the water go?"

Through: Children will read Holt Science, grade two, pages 69-72, about types of clouds. Children will choose either The Cloud Book or It Looked Like Spilt Milk to read and discuss in a small group. There should be multiple copies so each child has a book. With an adult, children will discuss types of clouds in the book. Chorally read the poem "Clouds" from a big book or large chart.

Beyond: Children will go outside and observe clouds. In the classroom, discuss stratus, cumulus, and cirrus clouds from the Weekly Reader teaching poster Clouds. Children will have a choice of painting clouds or making cloud pictures by gluing cotton to paper. Ask children to label their picture with the name of the type of cloud they made. Children will write in their

learning logs about what they learned about clouds.

3. Concept: Fog is low clouds.

Into: Give students opportunities to talk about foggy day experiences. Ask what fog looks like and how noises sound in fog.

Through: The class will participate in shared reading of the poem "Fog." The poem should be printed on a large chart so everyone can see. Discuss personification of fog, meaning of "little cat feet," and "haunches." Ask why Sandburg might choose to compare fog to a cat.

Beyond: Together brainstorm animals that are like the wind as fog is like a cat. Have children write a poem about wind or another type of weather. Put the poems in their author's folders.

Children will write about fog in their learning logs.

4. Concepts: Water, air, and sun cause weather. The water cycle is part of weather.

Into: Put ice water in a tin can. Fill a large bowl with hot water. Set a small board across the

bowl and put the can of cold water on the bowl. The children will watch water condense on the can (Webster, 1982). Discuss how water got there and the term "condensation."

Discuss with children what happens to water when it rains. Ask if rain is a solid, liquid, or gas. Make rain in a glass pot. Put water in the pot. Put a lid on it and place it on a hot plate. Set a bag of ice on the lid. Children will observe water evaporating, condensing on the lid of the pot, and dripping back into the pot.

Have a bulletin board prepared which illustrates water moving through a cloud, a pond, and through the air, with arrows showing the direction of water in the cycle. Students will write in their learning logs.

Through: Read to the class Rain and Hail and Flash, Crash, Rumble and Roll. Listen to the cassette and read the booklet, Wonders of Learning Kit: Why Does It Rain? Students will read on their own Holt Science, pp. 65-67.

Beyond: Students will take turns orally explaining the water cycle using the bulletin board. To

illustrate the water cycle, students will draw a circle and divide it into thirds. They will draw water evaporating, water in a pond, and rain in the three sections. Have them hold their pictures, sit with a partner, and take turns explaining what happens during the water cycle.

5. Concept: Weather (rain) affects people.

Into: Ask students to think of good things about rain and bad things about rain. List their ideas on a large sheet of paper. Explain that students will read books about how rain affects people. Students will choose a book, read it with a partner or a group, and report to the class the effects of rain, good or bad, and what the person in the book did about it.

Through: Choices of books are: A Wet Monday, The Wet World, The Cat in the Hat, Rainy Days Together, Euphonia and the Flood, Bringing the Rain to Kapiti Plain, Mushroom in the Rain, The Big Rain, or Rain, Rain.

Children will read the book silently, then chorally, so better readers may help other readers. The teacher will discuss with each

group the effects of rain on the people in the book, asking questions pertaining to the characters' feelings, clothing, activities, work, and, if appropriate, culture. Each group will pick a spokesperson to report on their book to the class. Have paper and writing materials available for students who wish to make a visual report to accompany the oral report.

Beyond: One student from each group will orally report on their book to the class. Students will add to the previously made list of good and bad effects of rain. Help students draw conclusions from the list, such as rain is helpful if there is not too much, although sometimes it may inconvenience people. Students will write in their learning logs.

Read to the class the poems, "Waiting at the Window," "Rainy Day," and "Happiness." Discuss feelings about rain each character had in the three poems. Students will write a story about what they do on a rainy day or about how rain makes them feel. Put the story in their author's folders.

If the weather is rainy, students will make a rain gauge with an empty can, surrounded by sand to keep it steady, and measure with a ruler the amount of rain (Webster, 1982, p. 28).

Students will watch the wordless video Rainshower and write a poem about the sounds and feelings of rain. This may be done in a five senses format:

Rain sounds...

Rain looks...

Rain smells...

Rain tastes...

Rain makes me feel....

Students who wish will share their poems with the class. Students will think of a title for their poem. Put the poems in their author's folders.

6. Concept: People need water and use it for leisure.

Into: The reporting of books and brainstorming effects of rain from the previous beyond

section will serve as the "into" activities for this lesson. Also, read to the class the poem, "Lazy Jane."

Through: Students will read Water is Wet to learn more uses of water. Students will brainstorm uses of water, including water for leisure and water for life necessities. They may name items from the reading selection as well as ideas from books read previously and their personal knowledge. Print these uses of water on three-by-five cards. Students will sort them into two groups--leisure and necessities--in a pocket chart. Leave the words where they can be easily seen for students' future reference while writing.

Beyond: For homework, students will make a list of ways they and their family use water every day for a week. For extra credit, students may pick one person in their community to interview about ways that person uses water at work, for example, a fireman, a grocery store worker, a custodian, or a farmer. Students will write about their interview in a report and orally share information learned with the class.

7. Concepts: Weather (snow and ice) affects people.

Into: To review how liquid becomes solid, students will make popsicles by freezing fruit juice, reading teacher-written directions from the chalkboard. Explain that sometimes water vapor freezes before it makes rain drops, forming crystals, then falls as snow. Have children share experiences with snow. Ask students to make predictions about Geraldine's Big Snow based on the title and pictures. Write these predictions on the chalkboard.

Through: Have students orally and silently read copies of Geraldine's Big Snow. They will verify, add to, or change predictions. Discuss how children get excited about snow. Students will record thoughts about snow in their learning logs.

Beyond: Children will participate in the Aims Project "Weather Wear" involving graphing types of clothing. They will write about their experience in their learning logs.

Have one person dress up in winter clothing. The rest of the children will try to draw that person in the clothing.

8. Concept: Weather affects what people wear.

Into: Read to the class When Animals Change Clothes. Discuss what people and animals do in the snow. Introduce books for group reading: "What Will Little Bear Wear?" in Little Bear, The Jacket I Wear in the Snow, and The Mitten. Students will pick one book to read, forming groups, with students choosing the same book in the same group.

Through: Students will make predictions about the book, read it silently, and then orally with a partner in their group.

Beyond: Students will work in groups to determine a way to present their book to the class, either through drama, reader's theatre, interviewing a character, or through art. There should be enough copies of the book for each student in the group to have one.

9. Concepts: Air is everywhere. Weather can be measured.

Into: Children will work in pairs. Each pair will have a large container of water and an empty glass. Students will put the glass upside down in the water, holding it straight, then tipping

it. An air bubble will come out of the glass (Webster, 1982, p. 9). Lead children to the conclusion that air occupies space.

Give every pair of children a plastic bag. Have one put a book or some small item on the bag while the bag is resting on a table. The other child will blow into the bag. Ask the students why the item went up, leading students to the conclusion air can push things, which is air pressure.

Through: Students will read the booklet and listen to the cassette tape, Wonders of Learning Kit: What Air Can Do.

Beyond: Students will make barometers with empty jars and balloons. Stretch a broken balloon over the top of an empty jar and secure with a rubber band. Tape a straw horizontally to the top. Put it next to a wall. Make a weather chart using a piece of paper with horizontal lines and tape it to the wall. Point the straw towards the chart. Watch it move as weather changes. Record where the straw is pointing on the chart during various kinds of weather (Webster, 1982, p. 31). Lead the class to draw

conclusions about air pressure. Students will write in their learning logs.

10. Concepts: Wind is moving air. Weather (wind) affects people. Weather (wind) can be measured.

Into: Teach the children "Song of the Wind." Students will make a pinwheel with a paper, pin, and pencil and blow on it. Ask, "What made it move?" If the weather is windy, students may take the pinwheel into the wind. The class will think of and the teacher will list some uses of wind, such as propelling wind mills, drying clothing, and moving sailboats.

Have students read chorally "Wind on the Hill" from a large chart.

Through: Students will choose and read one of these these books: Attic of the Wind, Gilberto and the Wind, What the Wind Told, When the Wind Stops, I See the Winds, or The Wind.

Students may work together or individually to read their books. They will conference individually with the teacher about their book.

Beyond: Students will choose one of these ways to make a presentation of their book:

* draw a comic strip,
* create a dance depicting movements of the wind,
* paint a picture involving response to books,
* write a story relating to something that happened in the book,
* make up a song,
* retell the book,
* redesign a book jacket.

Have a kite-flying day. Students who are able may build their own kites at home and research and write about aerodynamics of kite flying. Students will write in their learning logs. Read to the class the poem "A Kite."

11. Concepts: **Weather is fun to think and write about. Weather affects people.**

Into: Read to class, The North Wind and the Sun. Discuss ways the weather affected the man in the book and ways it has affected the children. Ask children if they like wind, and why. Show the children the book Follow the Wind. Ask if one could follow the wind, and how.

Through: Read to the class Follow the Wind. Review the places the wind went and make inferences

about how it felt. Discuss the author's use of personification in both Follow the Wind and The North Wind and the Sun. Read to the class East of the Sun and West of the Moon.

Compare personification among the three stories. All have wind that speaks, listens, and moves. Make a list of all the things wind does in these stories that people also do, such as sleep, help others, boast, and so on. Teach the song "The Wind Blew East."

Beyond: Students will write a story using personification. They may use wind or another type of weather. The weather must have feelings and speak. Put the stories in their author's folders.

12. Concept: Lightning and thunder are caused by electricity.

Into: Ask students if they ever walked on carpet, then touched something metal or somebody else and got a little shock. Let students tell experiences. Give each student a balloon and something made of wool. Students will rub the inflated balloon on the woolen item and put the

balloon to their ear to hear static electricity (Tannenbaum & Stillman, 1960).

Through: Read to the class We Read About Lightning and Thunder, pages 14-21. Also read about Ben Franklin's experiment with thunder and lightning in A Book About Ben Franklin. Have students tell what they would do to stay safe in a lightning storm and write these ideas down.

Students will read Flash, Crash, Rumble and Roll on their own.

Beyond: Students will review the ways to stay safe in a lightning storm mentioned in Flash, Crash, Rumble and Roll. Compare the list the students made earlier to what the author of Flash, Crash, Rumble and Roll said about staying safe in lightning. Students will add ways to stay safe to their lists and change any ideas that were not safe.

Students will paint a picture of a stormy sky.

13. Concept: Weather can be predicted and measured.

Into: Reread Geraldine's Big Snow. Review that Geraldine knew it was going to snow because she

heard it on the radio. Watch some videotaped recordings of TV weather forecasts. Talk about the style of language used. Read the book, Evening Gray, Morning Red to the class. Show the children the book Cloudy With a Chance of Meatballs. Have them predict what the book will be about and ask questions about it.

Through: Children will read Cloudy With a Chance of Meatballs silently, then orally in small groups, each with his/her own copy. In small groups children should confirm or disregard their predictions and answer their questions about the story. Discuss the difference between fiction and nonfiction.

Beyond: Students have been daily reading or having read to them newspaper weather forecasts. They will have a choice of these assignments:

* write to a TV weather announcer, asking some questions,
* develop a fictional weather forecast, including maps, and read it to the class as if you were a radio or TV announcer,
* compare a satellite map from the newspaper to a political map, either orally or in writing.

* make up a weather forecast that might have been in an old almanac in the style of those quoted in Evening Gray, Morning Red.

14. Concept: Weather changes through the seasons.

Into: Read to the students Sylvester and the Magic Pebble, noting the changes in the seasons.

Through: Students will choose to read Chicken Soup with Rice, A Circle of Seasons, Little Monster at Home, or The Little Island.

Beyond: Students will make a season wheel by cutting out a circle from a large piece of paper, dividing it into four sections and labeling them autumn, winter, spring, and summer. Students will draw a picture depicting the season in each section, showing the type of weather.

Students will write in their learning logs.

15. Concept: Pollution may be causing the earth to warm, threatening life as people now know it.

Into: Explain to the children that some things, when burned, give off a gas called carbon dioxide. This carbon dioxide goes into the air, making a sort of blanket in the sky. Too much carbon

dioxide traps the sun's heat next to the earth, making the earth too warm. Explain, using a globe, that around the earth is a layer of ozone which protects the earth from too much heat and radiation from the sun. Some chemicals made my man may be destroying this ozone.

Through: For homework, students will ask their parents to help them look for newspaper and magazine articles about the greenhouse effect or global warming. They will share these with the class. Show the film The Infinite Voyage: Crises in the Atmosphere. Talk to students throughout the film, explaining the concepts presented, as the vocabulary and concepts in this film may be difficult for many students to comprehend. The pictures, however, illustrate the concepts well.

Discuss the film with the students, answering questions, clearing misconceptions, and allowing students to voice opinions and feelings.

Beyond: The students will write to a U. S. congressman or senator asking them to pass laws

that will stop people from harming the atmosphere.

Culmination of Unit

Throughout the unit, the teacher will have read to the children the book, Mary Poppins. Watch the movie Mary Poppins and compare it to the book through discussion, focusing on why the movie and the book are different. Also note the author's technique of making weather change in the story as events change. Students will write about the book and movie in their learning logs.

Make individual weather collages with magazine pictures.

Make a graph of favorite types of weather.

Students will pick one piece of writing about weather from their author's folder. They will revise, edit, and publish it.

Have a parents' day or invite another class to view art, graphs, and word lists; and to read learning logs and published materials. Students will set up centers to duplicate weather experiments done throughout the unit for their parents or the other class. A few

students will be in charge of explaining each experiment center to viewers.

Curriculum Map

Social Studies.

Interview a community worker about water use

Watch TV weather forecasts

Sort ways people use water into leisure and necessities

Use a newspaper to get information

Compare maps of a weather forecast to other maps

Read about Ben Franklin

Read sayings from old almanacs about weather

Work in cooperative groups

Science.

Read about weather from a newspaper

Observe three forms of water

Observe evaporation and condensation

Observe water "raining" after condensing

Make a rain gauge

Write about the five senses

Observe air in water

Observe effects of air pressure

Make a barometer

Make static electricity with balloons and woolen items

Make popsicles to observe liquid changing to solid

Design a kite

Make predictions and hypotheses

Math.

Graph daily temperature

Graph daily weather

Graph favorite weather

Measure rainfall

Graph clothing worn

Measure air pressure

Art.

Paint or make cotton cloud formations

Draw stages of the water cycle

Depict a book in some artistic way to share with others

Draw a person in winter clothing

Paint a stormy sky

Design a book jacket

Music.

Make up songs about weather

Sing: "Song of the Wind" and "The Wind Blew East"

Writing.

Write in a learning log daily

Write a poem about wind and a poem about rain

Write to a TV weather announcer

Write a fictional weather forecast

Write a story personifying weather

Write a story about what to do on a rainy day

Write to a congressman about global warming

Drama.

Pretend to be a character in a book

Interview a character in a book

Perform reader's theatre

Oral Language.

Give a weather forecast

Participate in group discussions

Make predictions

Relate personal experiences

Explain the water cycle

Report on books to the class

Interview a community worker

Physical Education.

Create a dance depicting the wind's movements

References

Aardema, V. (1981). Bringing the rain to Kapiti Plain. New York: Dial Press.

Abruscato, J., Fossaceca, J. W., Hassard, J., & Peck, D. (1986). Holt science: grade 2. New York: Holt, Rinehart & Winston.

Anonymous. A kite. (1988). In J. Klem, D. Taylor, E. Reid, R. Cherrua, G. Scobie, M. Opper, J. Namska, & R. Broda (Eds.), Ride upon the breeze (p. 33). Canada: Holt, Rinehart & Winston of Canada, Limited.

Bancroft, H., & Van Gelder, R. G. (1963). Animals in winter. New York: Scholastic.

Barret, J. (1978). Cloudy with a chance of meatballs. New York: Scholastic.

Baum, A., & Baum, J. (1962). One bright Monday morning. New York: Random House.

Boegehold, B. (1974). What the wind told. New York: Parents Magazine Press.

Branley, F. M. (1964). Flash, crash, rumble and roll. New York: Thomas Y. Crowell Co.

Branley, F. M. (1963). Rain and hail. New York: Thomas Y. Crowell Co.

Branley, F. M. (1987). It's raining cats and dogs: All kinds of weather and why we have it. Boston: Houghton Mifflin Co.

Briggs, R., & Fisk, N. (1968). Lindbergh the lone flier. New York: Howard McCann.

Camp, J. (1981). Benji and the tornado. New York: Golden Press.

Calhoun, M. (1976). Euphonia and the flood. New York: Parents Magazine Press.

Chaffin, L. D. (1969). Bear weather. London: The Macmillan Co.

Churchill. (1985). Rainshower [videotape]. Los Angeles: Churchill.

Cowley, J. (1983). Rain, rain. Wellington: Department of Education.

de Paola, T. (1975). The cloud book. New York: Holiday House.

de La Fontaine, J. (1964). The north wind and the sun. New York: Franklin Watts Inc.

Edwards, D., & Williams, J. (1976). A wet Monday. New York: William Morrow & Co.

Ets, M. H. (1963). Gilberto and the wind. New York: Viking Press.

Francoise. (1961). The big rain. New York: Charles Scribner's Sons.

Friedberg, L. (Producer). (1989). The infinite voyage: Crises in the atmosphere [Film]. Pittsburgh: WQED Communications Inc.

Gallant, R. A. (1957). Exploring the weather. Garden City, UT: Garden City Books.

Ginsburg, M. (1974). Mushroom in the rain. New York: Macmillan Publishing Co.

Gross, R. B. (1975). A book about Benjamin Franklin. New York: Scholastic.

Hill, B. (1984). The wind. Wellington, New Zealand: P. D. Hasselberg, Government Printer.

Karchmer, P. (1980). Song of the wind [song]. In M. V. Marsh, C. Rinehart, & E. Savage (Eds.), The spectrum of music with related arts: MacMillan music, teacher's edition I (p. 22). New York: Macmillan Publishing Co.

Keller, H. (1988). Geraldine's big snow. Greenwillow: New York.

Livingston, M. C. (1982). A circle of seasons. New York: Holiday House.

Lund, D. H. (1966). Attic of the wind. New York: Parents Magazine Press.

MacDonald, G., & Weisgard, L. (1946). The little island. New York: Scholastic.

May, C. P. (1965). When animals change clothes. New York: Young Readers Press.

Mayer, M. (1978). Little monster at home. New York: Golden Press.

Mayer, M. (1980). East of the sun and west of the moon. New York: Macmillan Publishing Co.

McClosky, R. (1948). Blueberries for Sal. New York: Scholastic.

Milne, A. A. (1924). Happiness. In When we were very young (p. 4). New York: E. P. Dutton & Co.

Milne, A. A. (1927). Waiting at the window. In Now we are six (pp. 91-92). New York: E. P. Dutton & Co.

Milne, A. A. (1927). Wind on the hill. In Now we are six (pp. 93-94). New York: E. P. Dutton & Co.

Minarik, E. H. (1957). Little bear. New York: Scholastic.

Mizumura, K. (1966). I see the winds. New York: Thomas Y. Crowell Co.

National Geographic Society. (1983). Wonders of learning kit: What air can do [Booklets and Cassette Recording]. Washington D. C.: Author.

National Geographic Society. (1983). Wonders of learning kit: Why does it rain? [Booklets and Cassette Recording]. Washington D. C.: Author.

Neitzel, S. (1989). The jacket I wear in the snow. New York: Greenwillow Books.

Parsons, E. (1971). Rainy days together. New York: Harper & Row.

Polacco, P. (1990). Thunder cake. New York: Philomel Books.

Pollock, P. (1985). Water is wet. New York: G. P. Putnam's Sons.

Rosetti, C. G. (1988). Clouds. In J. Klem, D. Taylor, E. Reid, R. Cherrua, G. Scobie, M. Opper, J. Namska, & R. Broda (Eds.), Ride upon the breeze (p. 46). Canada: Holt, Rinehart & Winston of Canada, Limited.

Sandburg, C. (1960). Fog. In Harvest poems (p. 39). New York: Harcourt, Brace & Jovanovich.

Sendak, M. (1962). Chicken soup with rice. New York: Harper & Row.

Shaw, C. G. (1947). It looked like spilt milk. New York: Scholastic.

Steig, W. (1969). Sylvester and the magic pebble. New York: Simon and Schuster Inc.

Steig, W. (1971). Amos and Boris. New York: Farrar, Straus & Giroux.

Seuss, Dr. (1957). The cat in the hat. Boston: Houghton Mifflin.

Silverstein, S. (1974). Lazy Jane. In Where the sidewalk ends, (p. 87). New York: Harper & Row.

Simon, N. (1954). The wet world. Philadelphia: J. B. Lippincott Co.

Tannenbaum, H. E., & Stillman, N. (1960). We read about lightning and thunder. St. Louis: Webster Publishing Co.

Travers, P. L. (1934). Mary Poppins. New York: Harcourt, Brace & World.

Tresselt, A. (1950). Follow the wind. New York: Lothrop, Lee & Shepard Co.

Tresselt. A. (1964). The mitten. New York: Lothrop, Lee & Shepard Co.

Van Allsburg, C. (1983). The wreck of the Zephyr. Boston: Houghton Mifflin Co.

Walsh, B. (Producer), & Stevenson, R. (Director). (1961). Mary Poppins [videotape]. Burbank, CA: Walt Disney Productions.

Webster, V. (1982). Weather experiments. Chicago: Childrens Press.

Weather Wear. Spring into math and science. Fresno, CA: Project Aims, pp. 22-23.

Weekly Reader. (1990). Clouds [poster]. Columbus, OH: Field Publications.

The wind blew east [song]. (1985). In E. Crook, B. Reimer, & D. S. Walker (Eds.), Silver burdett music: Centennial edition, grade 1 (p. 85). Morristown, NJ: Silver Burdett.

Wise, W. (1988). Rainy day. In J. Klem, D. Taylor, E. Reid, R. Cherrua, G. Scobie, M. Opper, J. Namska, & R. Broda (Eds.), Ride upon the breeze (p. 32). Canada: Holt, Rhinehart & Winston of Canada, Limited.

Witty, M. (1981). A Day in the life of a meteorologist. Mawah, NJ: Troll.

Wolff, B. (1976). Evening gray, morning red. New York: Macmillan Publishing Co.

Yashima, Taro, (1958). Umbrella. New York: The Viking Press.

Zolotow, C. (1962). When the wind stops. New York: Harper & Row.